

ME AND YOU AND BAY (AB) USE

Proceedings of the Annual Meeting, 1979

"Citizens Program for the Chesapeake Bay, Inc."

Fredericksburg, Virginia

January 10-11, 1979

Camera-Ready Typescript by Diana W. Landes

Photographs by Mary C. Holliman

Sea Grant
Extension Division
Virginia Polytechnic Institute and State University
Blacksburg, Virginia 24061

VPI-SG-79-02

LD

5655

A762

1979h

C.2

TABLE OF CONTENTS

	<u>Page</u>
Foreword	v
Conference Program	1
Me and You and Bay (Ab)Use	5
Pollution and Us	9
Individual Decisions and Public Outcomes (Why People Do What They Do)	15
Small Group Workshops	27
I. The Seafood Industry	27
II. Recreational Boating and Sportsfishing	31
III. Property Owners and Shoreline Users	37
IV. Commerce and Industry	45
V. Agriculture and Forestry	49

FOREWORD

The content of the 1979 Citizens Program for the Chesapeake Bay, Inc. (CPCB) Annual Conference was based on a paper delivered by Dr. Ed Aiton, former president, CPCB at its 1978 conference. His paper was entitled, "A Concept and a Proposal for a Program of Mini-Management of Chesapeake Bay Resources." Dr. Aiton's theme focused on the need for assessing individual decisions as they impact Chesapeake Bay resources.

The planning committee designed the conference for maximum participant involvement. To focus on the issues, keynote speakers developed a framework of individual perceptions which lead to decisions impacting Bay resources. President Valliant outlined the objectives and the results expected from the conference, Professors Cronin and Collins discussed the behavior of the individual and resulting impacts on Bay resources.

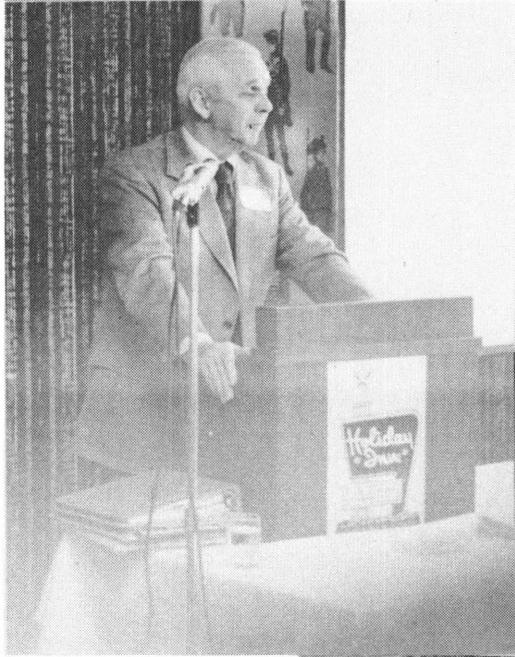
Small group discussions were the life blood of the conference. Five groups -- seafood industry, recreational boating and sportsfishing, industry and commerce, property owners and shoreline users, and agriculture and forestry -- were selected for discussion. The small groups conducted their sessions by responding to four questions:

- 1) Identify problems and/or issues created by individual decisions,
- 2) Define the alternatives for solving these problems,
- 3) Determine the incentive needed to implement the process, and
- 4) Outline courses of action.

Many problems and issues were defined among the five small discussion groups. The results are included in this proceedings issue.

1979 CPCB Program Committee

Edward W. Aiton	Len Shabman
L. Eugene Cronin	Jeremiah Valliant
Fran Flanigan	Charles W. Coale, Jr.,
George Hagerman	Chairman



Citizens Program for the Chesapeake Bay, Inc.
CONFERENCE PROGRAM

"Me and You and Bay (Ab)Use"

Conference Location: Holiday Inn, South, Fredericksburg
US #1 and I-95, (703) 898-1102
Robert E. Lee Room

9:00 -

10:00 AM Registration: CPCB - Nancy Lowe, Chairperson

Registration Staff:

Pat Young
Kitty Cox
Ruth Hagerman
Betty Hoey
Louise Valliant
Alice Cronin
Tom Wilcox

Coffee served during
Registration

MORNING SESSION, WEDNESDAY, JANUARY 10, 1979
Session Chairman: W. Cranston Morgan

10:00 AM Welcome: Jeremiah Valliant, President, CPCB, Inc.

10:30 -

11:30 Keynote Addresses:

SMALL SOURCE AND NON-POINT POLLUTION: EXTENT,
SIGNIFICANCE, AND IMPACTS

Speaker: L. Eugene Cronin, Director
Chesapeake Bay Research Consortium

INDIVIDUAL DECISIONS AND PUBLIC OUTCOMES (WHY
PEOPLE DO WHAT THEY DO)

Speaker: Richard C. Collins, Chairman
Department of Urban and Environmental
Planning
School of Architecture
University of Virginia

11:30 -

11:50 Assignment of participants to Specific Small Group
Panels - Charles Coale

12:00 -

1:30 PM Arranged Luncheon - Holiday Inn Public Dining Room

AFTERNOON SESSION, WEDNESDAY, JANUARY 10, 1979

Session Chairman: George Hagerman

The small group panels should examine the problems resulting from individual decision processes and make recommendations for alternative courses of action, identify those incentives necessary for solving the noted problems, and outline specific courses of action. Each group leader was given the following format:

- 1) Learn the name, activity, and primary interest of each participant.
- 2) Present a statement of purpose and objectives.
- 3) Solicit problem areas from participants. That is, identify problems created by individual decisions: What decisions do I (my group) make that affect others? What decisions do others make that affect me?
- 4) Separately discuss each problem area, with possible solutions or alternatives and appropriate incentives for each, including what and how the participants can assist in the solution through individual action or the participant's organization, and determine what are the sources of funds needed to support these projects.
- 5) For each problem, arrive at a consensus for solutions and/or alternatives and appropriate incentives.
- 6) Outline courses of action for developing an educational program related to identified problems.

MORNING SESSION, THURSDAY, JANUARY 11, 1979

Session Chairman: J. Kevin Sullivan

9:00 -

- | | |
|----------|---|
| 10:15 AM | Conference participants convene for reports of the small group panels |
| 10:15 | Coffee break |
| 10:30 | Re-convene for discussion and questions from participants |
| 1:30 PM | CPCB Business Meeting |

SMALL GROUP PANELS

THE SEAFOOD INDUSTRY

Small Group Chairman: Weston Conley
Recorder : Kitty Cox

RECREATIONAL BOATING AND SPORTSFISHING

Small Group Chairman: Jerry Valliant
Recorder : Harry Stone

PROPERTY OWNERS AND SHORELINE USERS

Small Group Chairman: E. Gordon Riley
Recorder : Jack Witten

COMMERCE AND INDUSTRY

Small Group Chairman: Cranston Morgan
Recorder : Fran Flanigan

AGRICULTURE AND FORESTRY

Small Group Chairman: Fred P. Miller
Recorder : Robert Hunt



ME AND YOU AND BAY (AB)USE

Jeremiah Valliant*
President, CPCB, Inc.

On behalf of the officers and members of the Citizens Program for the Chesapeake Bay, Inc., may I extend to you a warm welcome and thank you for making the effort to attend. Your advice and counsel is sought after by many organizations, many of which are meeting this week. Especially in view of the competition for your time, your participation with us today is deeply appreciated.

May the Lord be with us as we proceed and may all of our work be begun, continued, and ended in him.

"Me and You and Bay Use or Abuse" is the theme of the 8th Annual Conference Program sponsored by the membership of the Citizens Program for the Chesapeake Bay, Inc. (CPCB). CPCB was formed in 1971 to find a means to manage Bay-wide resources for the best public long-time use. In addition to its first conference in College Park, Maryland, CPCB has conducted programs examining the citizens' role in assisting officials to make public choices, discussing the Title II Commission as a management tool for the Chesapeake Bay, examining the water quality goals for the Chesapeake Bay, and studying the impact of recent environmental legislation on the Chesapeake Bay. The underlying purpose of each conference was to create an understanding by the public of the choices available for managing Bay resources. Each conference, hopefully, produced a realization of a problem associated with Bay management efforts.

CPCB is an alliance of organizations and accepts partial responsibility for educating the public about the Bay's problems. As an alliance, the many groups involved in its membership give a wide range of ideas, perceptions, and alternatives to problems. For these reasons, EPA decided to use CPCB, Inc. as a general contractor (good and bad).

When EPA decided to contract with CPCB, Inc. to carry out a part of its Congress Mandated Program to involve lay citizens in dialogue that would make legislation and regulations by them more appropriate and practical, the publicity that followed seemed to be interpreted by some people that the CPCB, Inc. was now going to be funded by the EPA, and that the CPCB, Inc. no longer had a need for funding by its membership dues and donations.

The fact is that the Citizens Program for the Chesapeake Bay, Inc. is solely funded by its membership.

*This paper was presented at the 8th Program and Annual Meeting of the Citizens Program for the Chesapeake Bay, Inc., Holiday Inn-South, Fredericksburg, Virginia, January 10, 1979.

The Chesapeake Bay Program is funded by the EPA funds and those funds and their disposition are audited frequently to be sure that they are not in any way intermingled with CPCB, Inc. funds.

The fact that the EPA contract could be cancelled in future years makes it doubly important that the Citizens Program for the Chesapeake Bay, Inc. be well endowed with money and plans. Some of the plans for the future will be discussed tomorrow at our Annual Meeting.

"Me and You and Bay Use or Abuse" -
Not the Book of Revelations
Rather
A Time of Revelations

We want to make it clear that our purpose in bringing together the Bay users is not to abuse or blame each other by emotional outbursts or critical remarks. Our purpose is a simple one, namely, have the people who use the Bay reveal their day-to-day experiences in order that we may identify some of the major problems created by individual decisions, what are the alternatives, and what incentives can we propose that would make the decisions we make more acceptable to each other and the Bay.

The regulators and those regulated must work willingly together if we are to be successful.

And what of ecology? Ecology is a little-understood word which has crept into everyday speech. I heard a Bishop the other day say, "Pray for our ecology." I doubt that he knew whereof he spoke, but it sounded progressive at the time and a pledge to faith. Ecology is simply the science of the interrelationship between organisms and their environments.

What is an organism? An individual constituted to carry on the activities of life by means of organs separate in function but mutually dependent; any living thing.

Any highly complex thing or structure with parts so integrated that their relation to one another is governed by their relationship to the whole organism. The doctrine that life and living processes are the manifestation of an activity possible only in the virtue of the state of autonomous organization of the system, rather than because of its individual components.

Conference Purpose and Orientation

The first session of our 1979 conference features two persons "setting the stage" by discussing the technical problems and the behavioral attitudes contributing to individual decisions impacting on a resource such as the Chesapeake Bay and its tributaries. Dr. Eugene Cronin begins with a discussion he entitles "You and Pollution." Emphasis will be placed on the pollution caused by individual decisions. Professor Rich Collins will focus attention on the behavior of individuals that causes them to "do what they do." He illustrates individual decisions and the public outcomes from them.

The purpose of these papers is to prepare each of you for a productive conference. It is a working conference and is meant to provide information to Bay-wide decision makers and managers. If you are to contribute, you must know what we expect from you and what results the conference will generate. The session before lunch will provide you with background material essential for your effective participation.

The focus of the conference is on you, the participants, as individual decision makers. The conference highlights the role of the individual as he or she makes choices in the Bay-wide society. All conference participants will work together in one of five groups designated at this program. The small groups include seafood industry, recreational boating and sports-fishing, property owners and shoreline users, commerce and industry, and agriculture and forestry. You were asked to make a first and second choice for a small group of your interest. Some of you may be placed in a group that you placed second, but we should balance the numbers in the small groups for the overall conference effectiveness. Charles Coale will make small group assignments at 11:30 a.m.

Conference Objectives

The overall objective of this CPCB Conference is to provide a public forum for examining the impact of decisions made by the individual and the means necessary to change the behavior of the individuals who use the Bay. If such a need is established, the users of the Bay and its tributaries may reside many miles from the Tidewater areas. The specific objectives of this conference are relatively simple and are expressed in four segments. The focus is on the individual decision makers.

Objective 1 - To identify problems and issues created by individual decisions related to your small group. In order to be objective and discuss all sides of the problem identified, group leaders should ask two questions about each problem or issue -- (1) What decisions do I make that affect others? and (2) What decisions do others make that affect me? Our small group leaders have selected three to eight problems or issues to begin the list. It is your responsibility, as a participant, to expand this list of problems. Once the small groups identify all of the relevant problems, the leader and the participants will rank the problems in order of most important to least important before discussing them. Given our time limit of one afternoon (four to six hours), small groups may find it possible to discuss only three to four problems thoroughly. It is important to analyze each problem in-depth.

Objective 2 - To define alternatives available to aid in solving the identified problems. For each problem identified, carefully defined alternatives should be developed. Perhaps not any more than three alternatives should be studied, given time limitation.

Objective 3 - To determine the incentives needed to assist with the individual decision process. Incentives may be needed before logical alternatives may be implemented and aid with solving a specific problem. A set of incentives may be applied to each alternative. Incentives may or may not be necessary for each alternative; that decision may rest with the small group in question.

Objective 4 - To outline courses of action. Courses of action should be outlined to cope with the problem identified. The mini-grant program idea might be a useful means in bringing together individuals with like interests for educating a peer group concerning an identified problem. Mini-grants might provide education and information through brochures, test demonstrations, and other educational means to change individual behavior patterns and decisions. Educational programs devised should identify source of funds for supporting the educational effort. Funding sources should be noted in the planning phase and supported by developing a realistic budget. The educational system providing the program support should be noted; for example, secondary or higher education, extension service or other governmental units or agencies.

To review, you the participants are responsible for satisfying four specific objectives at this conference.

Objective 1 - To identify problems created from the individual decision process.

Objective 2 - To develop alternatives for solving identified problems.

Objective 3 - To identify incentives to assist with the individual decision process.

Objective 4 - To outline an action plan for education.

What Results Do We Expect from This Conference?

(1) This conference should inform and assist organizational leaders and firms to prepare follow-up conferences and actions within their respective organizations, programs, and spheres of influence. We have organized five such groups assembled here.

(2) This conference should enlarge the concept of what individuals and firms can do to enhance the Bay. It might provide a realization to individual decision makers that might change their behavior. This realization might occur through:

- (a) actual choices in managing Bay resources,
- (b) application of educational programs, or
- (c) legislatively.

(3) This conference should provide useful information on the needs of Bay users for the Chesapeake Bay - EPA Program. And --

(4) This conference could enlarge and further the on-going program of work of the CPCB by:

- (a) increase participation of the number and influence of organizations and firms; and
- (b) provide literature, meeting guides, and substance for programs and actions of local groups.

POLLUTION AND US

L. Eugene Cronin
Director, Chesapeake Research Consortium

What is Pollution?

We speak of pollution very casually, and each of us has a general idea of what we mean. A definition which is reasonably exact, however, is not easily stated. Is it "any change in the Bay"? No, because one of the important characteristics of the Bay is constant change. "Any introduction into the Bay"? No, leaves fall every year. "Damage to the Bay"? Not necessarily, for who is to define damage? "Change in the ecosystem"? Not good enough, because improvements in water quality also involve ecosystem changes.

Perhaps the dictionary will help. It says -- "to make impure, unclean, impair or destroy purity, defile, desecrate, profane, corrupt." These are obviously related, but none of them is sufficient.

A formal definition of marine pollution was prepared by the International Oceanographic Committee for UNESCO, and it illustrates the complexity of the idea. "Marine pollution is the introduction by man, directly or indirectly, of substances into the marine environment (including fishing), impairing the quality for use of seawater and reduction of amenities." The dictionary does help with "amenities," which means pleasantness or agreeableness.

I think that this can be reduced to a simpler but adequate set of four points. Pollution of Chesapeake Bay is introduction (1) from man (2) into the Bay system (3) with harmful effects (4) on the quality of the Bay for use, now or in the future. If we recognize that this involves the total Bay system and introductions at any point in the hydrologic cycle if they reach the Bay, we have an image that seems useful.

* What Are the Pollutants?

The principal pollutants of estuaries were listed for the EPA Conference on Estuarine Pollution Control and Assessment in 1975. They can be

Pathogens	Brine
Sediments	Toxic inorganic chemicals
* Solid wastes	Toxic organic chemicals
Color sources	Petroleum
Odor or taste sources	Nutrients
Floatables	Radioactivity
Heat	Oxygen demand
Freshwater	Acids and bases

* Each becomes a pollutant when enough is introduced to injure a use. It is obvious that heat, nutrients, and some of the others can be valuable additions at the right time and place and in useful concentrations.

* What Are the Uses?

At the 1975 Conference, the most important uses which are made of estuaries were listed:

Commercial shipping	Water extraction
Shoreline development	Military purposes
Recreation and aesthetic enjoyment	Research and education
Mining	Climate control
Generation of electricity	Biological harvest
	Preservation
	Waste placement

Even this list of a dozen uses is an over-simplification. Obviously, recreation includes many kinds of use -- boating, swimming, surfing, sunning, hunting, fishing, aesthetic enjoyment -- and other uses can also be sub-divided.

How are Uses and Pollutants Related to Each Other?

Figure 1 suggests the effects of each principal kind of pollution on each principal use. It is clear that all of the pollutants can affect the quality of water for subsequent use, and that some of the effects can be substantial and multiple.

What happens if we make the matrix the other way, and ask which uses might cause pollution? Figure 2 shows that each use, except for preservation and climate control, has resulted or might result in significant pollution. In fact, there would be no pollution if we weren't using the Bay. It is our use that contains the threat of damage through pollution. Use is the cause of pollution, which reduces use.

How Might Each Use Cause Pollution?

1. Commercial shipping increases sediment because it requires dredging and spoil placement and because the propellers of large ships stir sediments in channels and harbors. Shipping has caused pollution by toxic materials, nutrients, and other chemicals because it has involved accidents and spills. Petroleum and its products are released into the Bay by every engine system using gasoline, fuel oil, or diesel oil.

2. Shoreline development -- residential, industrial, or recreational -- can release pathogens, sediment, solid wastes, floatables, toxic chemicals, nutrients, and odiferous conditions by poor management of construction, of waste and trash handling, and of accidents. Introduction of large quantities of freshwater, brine, radioactive materials, or materials which consume oxygen are quite possible.

3. Recreation and aesthetic enjoyment seem innocuous, but boating may require marine dredging, construction, and operation and boats also

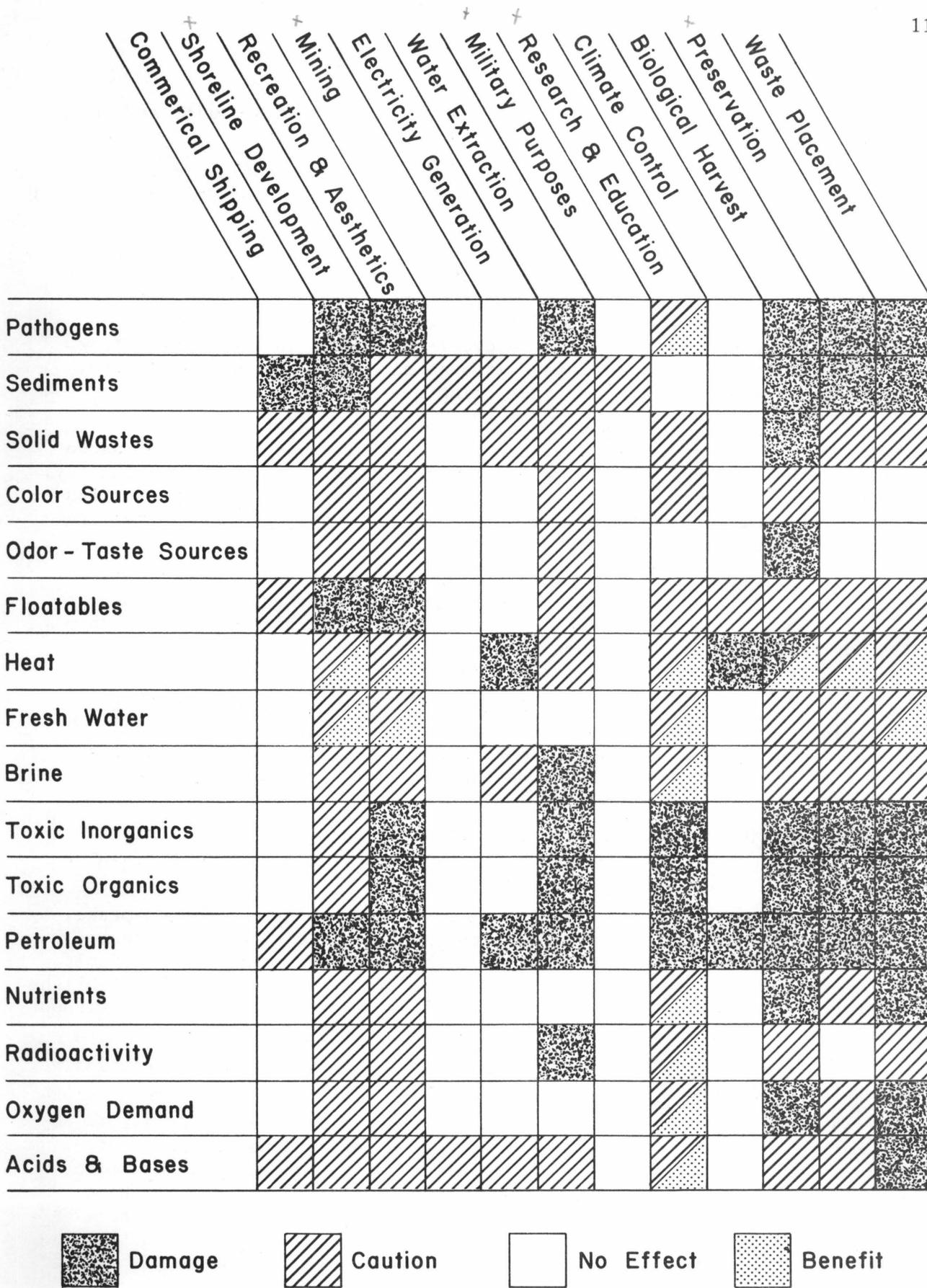


Figure 1. Probable effects of pollutants.

use petroleum fuels. Facilities constructed to support swimming and hunting may pollute from sewage.

4. Mining in the Bay has been limited to sand, gravel, and old oyster shell. Sediments are stirred and undesired chemicals may be released from bottom deposits.

5. Generation of electricity at the edge of the Bay or its tributaries requires massive construction which involves sediment release, and plants sometimes introduce heat, biocides and other chemicals, including radioactive materials. If liquid fuels are transported in the Bay, the probability of spills increases. Hydroelectric dams can modify the flow of water, with too little released at some times and too much at others, from the point of view of resources below the dam.

6. Extraction of freshwater can occur in very different ways. Proposals are being made to increase export of freshwater from the Susquehanna to the Delaware River system -- with loss of freshwater from the Bay. In addition, some power plants and other water users utilize Bay or tributaries for cooling, releasing freshwater into the atmosphere and creating brine which may be put back into the estuary.

7. Military purposes include at least firing ranges, testing of explosives, training of naval officers, ship storage, and general support of large ships. Construction and ship operations release sediments, ship transport introduces petroleum, and firing ranges may introduce "pollutants" which are not in our usual lists.

8. Research and education, for which the Bay is exceptionally useful, also hold potentials for pollution. Since pathogenic organisms, toxic chemicals, and radioactive materials may be used, there is a possibility of release into the Bay. Research vessels introduce petroleum products.

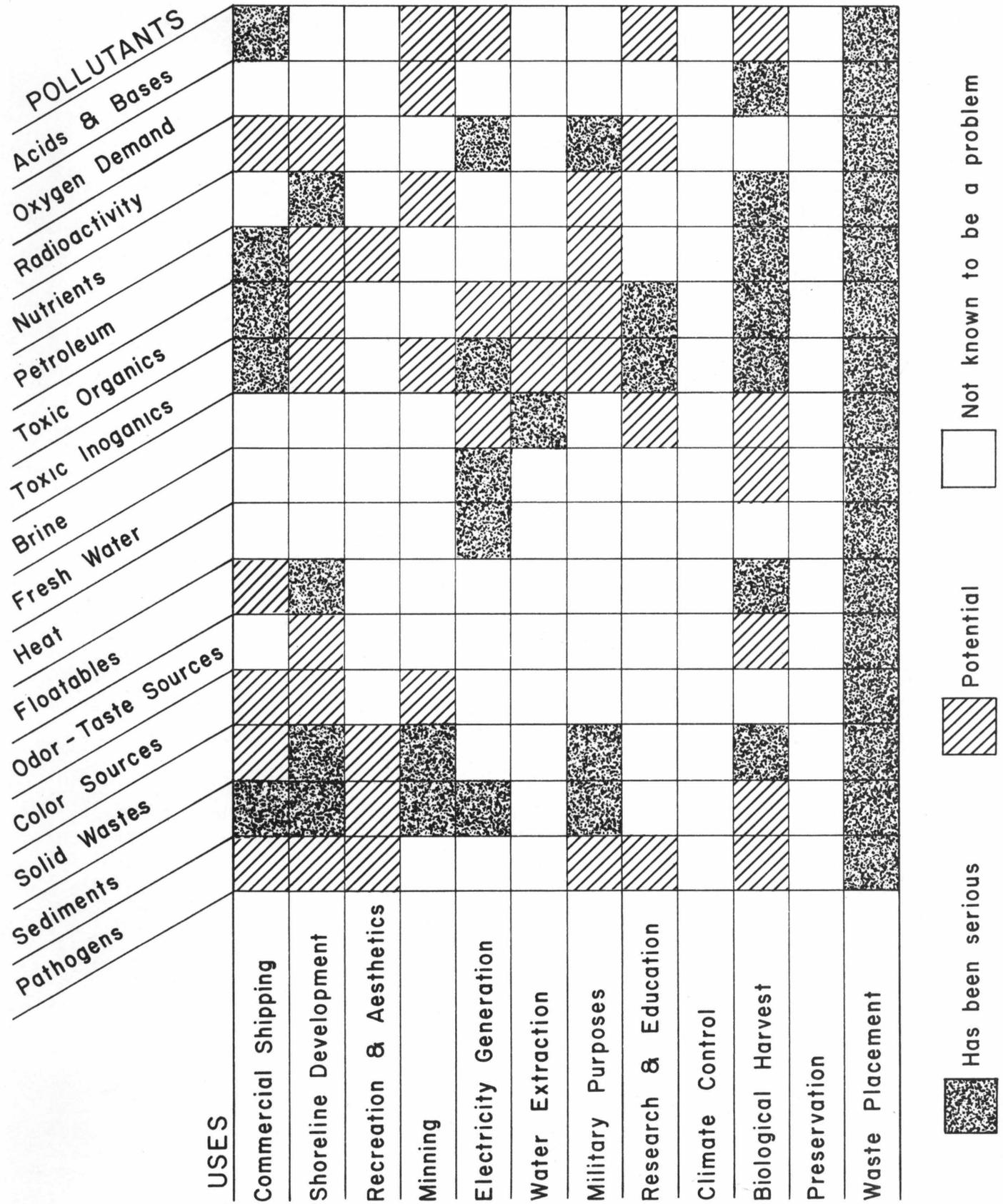
9. Climate control is a benefit from the Bay, not a use in the sense of other items catalogued here. The tempering of summer and winter climates around the Bay holds no obvious threat of pollution.

10. Biological harvesting does not normally pollute the Chesapeake, but careless practices can release pathogens, sediments, solid wastes, floatable wastes, large quantities of wash water, oil, nutrient chemicals, or oxygen-demanding materials. There are serious difficulties in establishing regulations which preclude pollution from all of these materials without requiring expensive equipment which processors use only occasionally.

11. Preservation, the protection of relatively undisturbed species, communities and systems, does not pollute the water.

12. Waste placement, which should not be called waste disposal, has both a past record and a future potential for serious pollution of every type. This is the use which requires greater management attention and achievement than any other if water quality is to be high enough to make other uses possible. There are many possible sources of such pollution -- industrial facilities, municipal treatment plants, trash from boaters, etc., etc. -- and each presents problems in management.

Figure 2. Possible pollution by use.



Who Pollutes?

Clearly, we pollute. Directly, and by our own daily decisions, or indirectly through the actions of our governments, our industrial suppliers, or our institutions. The close relationship between us and pollution is emphasized by the high coincidence between the distribution of people around the Bay and the sites where pollution is most serious.

High sensitivity by each person of his or her role as a possible cause of pollution may be more important in assuring the future health of the Chesapeake Bay than any other single factor. The concerned person will be careful in his or her own activities, will insist on effective research, legislation, regulation, and enforcement in relation to pollution and will be willing to bear a fair share of the costs.

The population of the Chesapeake Bay region is expected to double in the next forty years. Pollution must not parallel that increase, or our uses will decline seriously and perhaps permanently. If the polluters are essentially us -- improvement and protection of the Bay is also the job of each of us.

Is Pollution the Whole Problem of "Me and You and Bay (Ab)Use"?

Unfortunately, no. We have focused on the introduction of harmful materials into the Bay, and that is a proper emphasis for the topic of this Conference. It does not, however, give appropriate attention to the equally complex problems of increasing competition for space on the water, for the limited resources of the Bay, or for profits from commercial efforts. It does not deal with the shared problem of safety for more and more users. Solution of these, and other community problems, will depend upon how well we make individual decisions on personal actions and on public actions.

There is no one else out there to correct the problems -- "they" are us. We are the source, and we can be the cure.

Acknowledgment

While Figure 1 is from a paper I had previously published, Figure 2 is new. It was developed as a consensus set of opinions by four persons with experience with the pollution problems caused by use. I wish to thank Dr. Donald Lear, Dr. Andrew J. McErlean, and Dr. Joseph Mihursky for the surprisingly hard work of making such a matrix. Their opinions were combined with mine in completing the figure.

INDIVIDUAL DECISIONS AND PUBLIC OUTCOMES
(WHY PEOPLE DO WHAT THEY DO)

Rich Collins
University of Virginia

George Bernard Shaw wrote somewhere that happiness is necessarily a by-product. It cannot be attained by pursuing it directly. Social scientists have a much bigger word to describe the results that emerge from a series of decisions which do not specifically aim at creating a particular phenomenon, but which as a composite effect, necessarily produce it. The word is *epiphenomenon*.¹

Good examples of by-products are American cities. Cities in this country are not the result of direct attention to some ideal form, optimal size or shape, or purposeful relationship between the city and the country, or of conscious design to produce relationships among land uses. They are the by-product of thousands of decisions aimed at selling land, investing for industrial purposes, avoiding taxes, and finding a better school for the children. Government agencies contribute to the outcome in their efforts to facilitate housing production, provide better roads, and provide drinking water.

Chesapeake Bay is not, unlike a city, a cultural phenomenon. It is initially a natural body of water. But the overlay of human uses makes it now as much an artifact as a city. Its present state, its future condition, and its basic quality will be largely a subject of men's actions. These actions will not, for the most part, focus upon the Chesapeake Bay as a distinct entity, nor be evaluated principally in terms of how the Bay will be affected.

However, the Chesapeake Bay study is a move in the direction of altering that process to pay greater attention to the impact of decisions on its character and integrity. The Bay, like the American city, becomes a subject of direct policy and attention when concern emerges over the decision processes which then force people to consider the intrinsic value of what is treated as a "by-product." If some recognizable, historic, bounded place becomes a focus of attention, it forces one to retrace the decision processes which shape it. To focus upon a place as an end in itself is to raise public awareness on the motivations, processes, and institutions which condition and shape it.

The Value of "Places"

We Americans have some of the greatest natural and cultural resources in the world. But as a people, I think it is fair to say, we have been more aggressively proud of our institutions than our places. Constitutionalism, federalism, free enterprise, judicial review -- these are the institutions that we have placed our faith in and see as contributing to our sense of national identity. However, there seems to be some reassessment of the value of place in comparison to institutions in our society.

The evidence of it is everywhere: in historic preservation of courthouses and depots, in heightened civic involvement in our cities, in the preservation of our rural and agricultural heritage, and perhaps most dramatically in the fight for environmental values in specific places. It is almost as if people have decided that they won't move to another place so they will work harder to preserve the quality of the place where they are. If what I perceive is accurate, it represents an important initiative. Chesapeake Bay is a place that we feel is threatened, so we necessarily have to examine and reassess our institutions and behavior in terms of the impact they have on that great natural and cultural resource.

When individuals or communities focus upon a particular community or natural resource, they tend to generate an emotional intensity which is less easily evoked by abstractions about decision processes, political behavior, market imperfections, or even human greed. Whether it is Lake Tahoe, San Francisco Bay, the Grand Tetons, or the Florida Everglades, the mobilization of public interest on a specific entity has a way of illuminating and making pertinent what were previously mere words, cliches, or theories.

Ironically, to focus upon a particular place in order to develop plans, strategies, and processes to maintain that place in ways that are compatible with popular goals, frequently throws one back into the ambiguities and conflicts of broader national policies. I think everyone understands that in important ways the future of Chesapeake Bay is directly tied to the resolution of energy policies, to inflationary tendencies, and to the balance of payments as well.

The Need for Planning and Limits

I have a hunch that the intensified interest in planning for particular places or resources is only one manifestation of a broader rediscovery of the reality of finiteness and limits. Someone has described a rut as a trap open on both ends; in some ways, the ruts of habit and existing inertia cause many to feel that they know what the outcome will be unless drastic changes are made.

The ethics or utility of decision processes and policy drives are seldom questioned when there appears to be no major conflicts in use. But when numbers increase, or constraints are imposed because of limits, or when collective outcomes become somehow more apparent, the premises and springs of action will be called forth to justify themselves.

We must give considerable credit, I think, to the environmental movement not only for bringing to the national attention the environmental degradation we are experiencing but, more important, in forcing a review of the basis of actions that generate this degradation. In the pursuit of that purpose, the environmental movement has exposed some analytical anomalies, discovered some indefensible accounting techniques, and produced powerful and troubling images of the future. It has also surfaced some ethical riddles which demand a rethinking of market economics, interest group liberalism, and the decision sciences including planning processes; and has thrown into question the belief that growth is an unequivocal, unanimous good which produces a better life for all.

Environmental politics have produced a series of slogans, images, and metaphors which have had an impact on public perceptions. The proverbs range from "There is no such thing as a free lunch," to "We have found the enemy and he is us," to the more oppositional bumper stickers, one of which argues that nuclear opponents of uncertain parentage should be left to freeze in the dark. Another resurrects the old story of the man who has just jumped off the Empire State Building and as he passes the 27th floor someone shouts from a window, "How's it going?" and he replies, "It's O.K. so far." This, it is argued, represents "free fall" and its inevitable consequence.²

The Dangers in "Growth"

Perhaps two of the better known images depict the dynamics of exponential growth. The project on the Predicament of Mankind which sponsored the book *The Limits of Growth* popularized these images.³

One recounts an ancient Persian legend about a clever member of the King's court who presented a very handsome chessboard to the King. When asked what he would like in return, he indicated a mere grain of rice on the first square, two grains on the second square, four on the third square, etc. would be all he wanted. The King agreed to this and ordered his rice stores open to realize this exchange. The King knew he had been duped when he saw that the 10th square had 512 grains and the 15th, 16,384. He could figure that the 40th square would call for a million grains, and there were more doublings than he liked to think about to follow.

The same book cited this French riddle: Suppose you owned a pond on which a water lily is growing. This lily, although a small plant, doubles every day. If left untouched, it will completely cover the pond and choke off all other life in 30 days. You decide that, since it is such a large pond and the pads are so small, you will wait and cut them back when the pond is half-full. What day will that be? The answer, of course, is the 29th day, which leaves one the impossible task of saving the pond in a single day. The point is that habitual patterns or familiar processes which in the past have produced no particular difficulty, can cause catastrophic consequences if they continue. The major element of the trap is that by the time you perceive the problem, it is too late to mount an appropriate response.

The fear of exponential growth -- or put another way, the growing perception that finiteness is incompatible with continued, unregulated growth -- is a potent psychological and political metaphor. People who talk of "spaceship earth," of the "spaceship economy," or a "steady state" system are expressing the same general image.

But none of these images of the danger of exponential growth and surprise has had as much power or stimulated so much creative thought as the image of the "tragedy of the commons."⁴ This story, widely disseminated in an essay by that title and authored by the genetic biologist Garrett Hardin, is worth considering here. The parable goes like this. There is a pasture that is open to all. Each herdsman owns his own cattle and can be expected to keep as many cattle as possible on the commons. This arrangement has worked successfully in this community for centuries. But now, because of increased human population and because some of the wars and diseases that used to limit cattle production have been removed by technology, the basic carrying capacity of the commons is threatened.

At this point, the inherent logic of centuries of behavior becomes remorselessly tragic.

As each individual considers his own well-being and attempts to maximize his own gain, he asks himself, like any good sophomore who has earned an A in Economics 101, "What is the utility to me of adding one animal to my herd?"⁵

The positive utility is one more cow and its value to him; the personal cost is his share of the community's loss which is only a fraction of the value to him personally of the additional animal. Rational behavior calls for the herdsman to increase his grazing animals. As Hardin notes:

"...this is the conclusion reached by each and every rational herdsman sharing a commons. Therein is the tragedy. Each man is locked into a system that compels him to increase his herd without limit -- in a world that is limited. Ruin is the destination toward which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons. Freedom in a commons brings ruin to all."⁶

This "tragedy of the commons" parable is most powerful and troubling because it does not confine itself to mathematical tyrannies or to biological properties, but concentrates on human rationality and social and political behavior, and the agony of ethical progress. At its core, the tragedy of the commons challenges the rationality of individual pursuit of self-interest in a finite world. It represents a challenge, therefore, to the basic rationale of an exclusive market economy, the belief in a more or less automatic public interest based on competing political interest groups, and forces one to search for some justifiable concept of the public interest.

Hardin is principally concerned with population growth as just one of a number of problems which he categorizes as having no technical solution. These non-technical problems can't be merely fixed, but require some change in human motivations, values, and behavior or they will continue to worsen. He says that population growth, if left unchecked, will grow to a maximum which would be far beyond the optimum for human survival or environmental sustainability. But, if the maximum is too much, what is the optimum and how can it be realized? He writes:

"The optimum population is then, less than the maximum. The difficulty of defining the optimum is enormous; so far as I know, no one has seriously tackled this problem. Reaching an acceptable and stable solution will surely require more than one generation of hard analytical work and much persuasion.

He wants the maximum good per person; but what is good? To one person it is wilderness, to another it is ski lodges for thousands. To one it is estuaries to nourish ducks for hunters to shoot; to another it is factory land. Comparing one good with another is, we usually say, impossible because goods are incommensurable. Incommensurables cannot be compared.

Theoretically this may be true; but in real life incommensurables are commensurable. Only a criterion of judgment and a system of weighing are needed. In nature the criterion is survival. Is it better for a species to be small and hideable or large and powerful? Natural selection commensurates the incommensurables. The compromise achieved depends on a natural weighing of the values of the variables.

Man must imitate this process. There is no doubt that in fact he already does, but *unconsciously* [emphasis mine]. It is when the hidden decisions are made explicit that the arguments begin. The problem for the years ahead is to work out an acceptable theory of weighing. Synergistic effects, non-linear variation, and difficulties in discounting the future, make the intellectual problem difficult but not (in principle) insoluble.⁷

Common Resource, Common Use

As Hardin points out, there is an implicit process and set of goals. Which principles have tended to govern the use of the Bay until now? What is the process? What goals are seen as most important? Are the processes and the goals, once made explicit, defensible in terms of the future? If not, what alternatives are there?

To avoid tragedy in both the environmental and the decision-making sense means that there must be some method to establish the community's long-range interests. Hardin sees the answer in what he calls "mutual coercion mutually agreed upon by the majority of the people affected."⁸ This is another way of saying we need democratic government.

A responsible use of a common resource must be the product of definite arrangements. These arrangements must come from advance knowledge of the tragic consequences of a failure or a positive vision of the optimum condition we seek. I think we would agree that we all have a common interest in sustaining the basic integrity of Chesapeake Bay. That sustainability is an unequivocal, unanimous good. Unfortunately, we do not know exactly what "sustainability" requires, and to contrast the Chesapeake Bay commons with the Hardin commons complicates even further the difficulty of realizing it.

Chesapeake Bay is more than a common resource employed for a common use. The Chesapeake Bay commons requires an evaluation of the relative value of different uses and the estimation of the effect of one type of use on the other uses. It's as if Hardin's commons not only had to limit cattle grazing, but also had to decide the competing claims of golfers, goats, and grass itself (we would say the "basic ecology"). Golfers, in modern jargon, are "recreational users." But if they had hit too many meadow muffins with a nine iron, the dairymen would soon have found themselves confronted with a potent political force.

The parable assumes more or less equal distributions of power among the herdsmen. "Mutual coercion mutually agreed upon" is the essence of democratic government and processes, but the reality again is that the power of groups varies considerably. The new rules, the "mutual coercion," will not be achieved by an equality of influence among all parties. The

participation process in democratic government affects the outcome. Those who have more power or those who perceive greater opportunities for advantage under the existing rules will want to keep the existing rules intact. It is only in the instance of an imminent, undeniable, and absolute crisis to the commons that change will be sought by all, and then, as we have suggested, it may be too late.

Further, all parties have some rational support for a decision to hide their personal value in the commons in order to shift the cost of the commons protection to others. Also, psychological denial of the reality of the commons will tend to offer benefits to the contestants. Some would see in kepone, oil spills, projected traffic for oil tankers, and the demand for refined oil a clear and present danger now; others do not or at least proclaim that they do not. The current situation with the Bay would be as if in the herdsman's common we had to accept as a constraint the existing distribution of cows on the development of the rules for the commons.

We all talk of "motherhood" issues, and I'm sure the protection of the Bay is a motherhood issue. We mean by that term that all accept it as a good. However, we all know that such issues -- including motherhood -- do not draw unanimous support. The reason is apparent. The distribution of costs and benefits in the realization of a common good produces a politics of its own.

Need for a Governing Policy

A third complicating factor of the real commons is that if we are to have "mutual coercion mutually agreed upon" we need a policy to govern the commons. Chesapeake Bay may provide the basis and identity for the "land of pleasant living," but it is not a policy. Chesapeake Bay is affected by individual decisions and business corporations but also by the actions of different governments -- federal, state, and local. Even within these governments there are huge and special interests with widely different views of how the commons should be managed. I might add that a city pursuing an expanded tax base can be as partial, single-minded, and aggressive as any of the top 500 firms on the New York exchange. One need not mention rivalry between states.

Chesapeake Bay could certainly benefit from an institution that had a specific charge to see that it was treated and respected as the commons it is, free from the rivalries of separate governmental interests. San Francisco Bay's Conservation and Development Commission and the interstate compact which serves as a basis for the protection of Lake Tahoe are examples of special government bodies created especially for the protection of a particular water resource. I don't think anyone in this room would concede the inferiority of Chesapeake Bay to either of those bodies of water.

In fact, the great size, range of uses, interstate values, and international significance of the Chesapeake Bay make it uniquely valuable, but also make the creation of a single institution which can govern it much more difficult. The real test of a natural resource is when we try to do more than preserve it in its pristine beauty, as in the case of Lake Tahoe, but to enjoy, explore, and use it intensively as well. Chesapeake Bay is a fuller test of our national values and institutions,

because the responsible use of the Bay is more representative of the complexity and conflict among values within our large society.

What is the Bay's Capacity?

A fourth issue which is underplayed in the commons parable is the factual basis of determining what the "carrying capacity" of the commons is and what evidence there is to support stronger mutual coercion. There is always the possibility, as some here will attest, that a technical fix is possible. It must be remembered that even technical fixes, however, require mutual coercion through government regulation, and someone will inevitably carry the cost of the fix -- either the taxpayer, the environment, the firm, or the consumer. This involves complicated issues of distribution equity and technical effectiveness.

To make it even more difficult, the relationship between private property and the commons is not that of grazing cattle but the uses of land. There is no more volatile issue in this country than so-called "private property rights" and how they can be reconciled to the community's goals. We are willing to concede commons status to a body of water; we are much less willing to think in those terms when it comes to altering the use and conversion of land.

In the development of "208" non-point source pollution plans, in restrictions on filling of wetlands or development in the flood plains, or in the relative powers of state or local government to set environmental regulations that govern the development of the land, we have an issue that is extremely controversial. In the parable of the commons, we could count the cows on the land and assign ownership, responsibility, and connect resource to environmental impact. This cannot easily be done when a body of water is markedly affected by thousands of square miles of land around it as well as water uses directly upon it. The relationships are real, but the importance of relationships are what the courts would call "conjectural." In some states, including the one we are meeting in, the task of setting rules on land use would be hard enough; it might even be more difficult to sustain them when challenged by private lawsuits.

I think environmental impact statements, hydrologic models, and careful studies of the biology of the estuaries, the characteristics of sand dunes, the measurement of phosphorous loadings, and the migration habits of bluefish are all vital. But you will forgive me if I pessimistically conclude that scientific evidence, as helpful and necessary as it is, will never be conclusive in terms of exactly what "coercion" should be employed, upon whom it must fall, and how soon.

Finally, and perhaps most significantly, the Hardin commons is not troubled by the spectre of government officials in Washington who do not see or know the Bay as a specific natural resource in any immediate and tangible way. Those officials tend to see the Bay as an "input" as well as a "by-product." They are not preoccupied with the Chesapeake Bay's character; they are more concerned about the effect of regulations impacting its quality on the price of oil, the rate of inflation, or the next election.

The effort to define an optimum solution to what is concededly a commons problem is even more difficult for protecting a resource such as

Chesapeake Bay than it is for establishing an ideal carrying capacity for a single piece of land. This is not to say that it is any more difficult to take the commons perspective than it is to try and achieve a just and effective set of priorities for the Bay by any other criterion of choice. In fact, the metaphor of the commons is less idealistic and Utopian in its premises than the prevailing, if unconscious, models we are now using to justify existing decision processes and outcomes.

The Benign, Invisible Hand

The tragedy of the commons is the opposite of the myth of the benign invisible hand which undergirds so much of the faith in the unregulated pursuit of profit in a free market. The tragedy of the commons assumes a tragic outcome from the pursuit of self-interested, rational individuals or firms. The benign invisible hand assumes there is a more or less unlimited possibility of economic expansion without natural or social constraints. The pursuit of individual preferences as they are reflected in the price system achieves the public interest. Even if selfishness is not the highest virtue, it is argued, it produces a highly useful result. The individual need not think about the effect of his demands on others; he can trust the system to provide the necessary correctives. The system is so perfect and so useful that no one needs to be public-minded.

The doctrine of the invisible hand has an impressive history in the development of our economics and our theory of the public interest. As long as economic expansion is the primary goal and as long as there are no extensive spillover effects, environmental limits, or explicit redistributive conflicts, the concept remains dominant. Government does intervene to correct some deficiencies, but when it does, it has as a major purpose the shifting to the public sector of the responsibility for stimulating growth and reducing the external impacts of decisions.

All parties in the environmental debate concede that purely private transactions can produce costs to others who are not parties to the exchange. If these spillovers are severe enough, or frequent enough, even the most conservative economists concede there is a case for public intervention. Most of our environmental policies, including land use regulation, can be seen as a response to costs that are imposed upon "neighbors," or a broader public, by market decisions to which they are not parties. Economists call these negative spillovers "externalities." The very word -- externality -- indicates the central perception of the economist's vision. The private exchange process is then seen as the ideal accounting unit and the environment is seen as "external" to the process and boundaries of conventional analysis. Instead of economics being a subject of ecology, ecology is seen as a subject of economics.

More Versus Less

The environmental movement can be described as an effort to force internalization of those "external costs" of air and water pollution and the effects of unwise land use. To the extent that it confines itself to just those purposes, it is compatible with the basic premises of unlimited, albeit modified, growth. The economic analysis shifts to what is called "welfare economics" and to cost-benefit analyses of alternative choices. But the basic economic premises remain intact

inasmuch as the maximum of economic return is still the standard judgment in the absence of a clear specification of other values. Money is what makes the incommensurables commensurable, to use Hardin's term. By comparing dollars, we can make oysters commensurable with oil refineries, dredging with fishery production, and user days for swimmers with the effluent quality of wastewater treatment plants. In the end, the real conflict is between the notion of unending economic consumption and the reality of a limited world. Both the claims to "more" and to "less" are moral and ethical visions which imply certain forms of human behavior as a basis for their realization. Which image will dominate our behavior is still up in the air.

I think that Sir Geoffrey Vickers is essentially correct, however, when he asserts that the "idea that liberty means freedom from limitation rather than freedom to choose our limitations is a particularly dangerous delusion for the overcrowded inhabitants of a rather small planet."⁹ Some limitations have to be established, and the real question is whether we will be able to establish them through processes of human persuasion and human control or whether they will come from unplanned limitations imposing their control.

How to Measure Values?

What then of some practical approaches to limitations upon the use of the commons? The first thing that is apparent is that we have to have some method of dealing explicitly with the values of the commons. We must find a way of asserting as well as measuring our value preferences. For example, oysters should not be measured in terms of their economic value alone. Presumably, oysters are somehow indicative of other values including the quality of the environment. If oysters cannot grow and survive, certain other costs are also inflicted on the environment.

One interesting approach has been suggested by a lawyer who sees a similarity in the environment to damages paid to humans for physical loss. He notes that courts have awarded damages for the loss of a foot, an arm, or a leg. These damages are not a simple report on the economic facts involved. He says that courts have also

"not been reluctant to award damages for the destruction of heirlooms, literary manuscripts, or other property having no ascertainable market value. Decisions of this sort are always hard, but not impossible. We have increasingly taken human pain and suffering into account in reckoning damages, not because anyone believes we can place an objective value on them, but because, even in view of all the room for disagreement, we come up with a better society by making rude estimations than by ignoring them altogether. We can make such estimates in regard to environmental losses fully aware that what we are really doing is making implicit normative judgments."¹⁰

When we make implicit normative judgments for collective ends, we are talking about some form of government response. It involves the calculation of economic costs and benefits but also the assertion and inclusion of other values. As you probably are thinking, this is one of the major purposes of the environmental impact statement. We must expect

conflict in the process. The public interest does not rest on an absence of conflict or upon unanimity. The pursuit of the public interest does involve government authoritatively determining which claim is valid. However, it does not try to duck the difficulty of this choice, nor does it attempt to simplify the choice by excluding relevant factors even if they cannot be quantified. In short, it calls for some leadership and a vision of the future.

The Public Interest

Unfortunately, we do not have a theory of the public interest at the current time which sustains the long-run interest and the need for deliberate choice that conflicts with what might appear to be immediate group preferences. In spite of the fact that polls show a sustained major support for environmental goals, I think it must be conceded that most current behavior is inimical to the long-run interests of the environment.

How can we plan democratically? How do we know when a public choice is in the long-run interest? These are the questions for which we lack a good answer in terms of general public acceptance.

Unfortunately, the political process becomes very much like the market in its prevailing view of what is in the public interest. A process which relies upon group struggle through interest group politics accepts a notion of the public interest as the adjustment of competing claims. Government is more an umpire than a separate institution charged with making public choices. Although theoretically government should provide the basis for choosing between alternative objectives, under this view of the public interest it is made unachievable.

During the 1950's and 1960's, a theory of the public interest arose which saw in "muddling through" the essence of the democratic process. This "muddling through" or, in political science terms, "disjointed incrementalism," came to be the accepted view of how our system works and also a justification for it. The pluralistic competition between organized interest groups provided for a public interest which evolved from the competition more or less automatically.

Perhaps the leading exponent of this view of public problem solving through mutual adjustment was Professor Charles Lindblom of Yale University. His views, somewhat distorted by politicians, were persuasive to a generation of political theorists and to the politically active public.

It is interesting, therefore, that Lindblom begins his most recent book with these words:

"Relentlessly accumulating evidence suggests that human life on the planet is headed for a catastrophe. Indeed, several disasters are possible and if we avoid one, we will be caught by another."¹¹ He writes further that "all citizens are now joined in a concern for peace, the conservation of energy, protection of the environment, economic stability, or collective purposes. A failure of policy-making leaves the entire society in peril. One person's loss is now every person's loss."⁵

I ask you, isn't the statement of one person's loss now being everyone's loss the essence of the commons? I believe it is. It suggests to me that the prevailing decision theories -- of economics, piecemeal adjustment, and even of technical problem-solving -- are inadequate for dealing with a commons, whether it be Chesapeake Bay or broader issues of national purpose.

The view that politics is only an inferior substitute to the market must be modified. The view that interest group politics is only a sloppier, more inefficient way of achieving personal goals must be altered to provide for a theory of the public interest based on common objectives.

The real test is whether we can develop a conception of the public interest which incorporates common concerns as something different from the calculation of immediate individual preferences. Walter Lippmann once wrote that the "public interest may be presumed to be what men would choose if they saw clearly, thought rationally, acted disinterestedly and benevolently."¹²

In your deliberations here, you might want to keep that idea in front of you. After all, that is not only a response to the commons, but a definition of real citizen participation.

FOOTNOTES

1. See Charles Lindblom, Politics and Markets (Basic Books, N.Y., 1977), pp. 257-258.
2. See Sir Geoffrey Vickers, "The End of Free Fall" in Value Systems and Social Processes (Basic Books, N.Y., 1968), p. 52.
3. See Meadows, et al., The Limits to Growth (Universe Books, N.Y., 1972).
4. Garret Hardin, "The Tragedy of the Commons" in Exploring New Ethics for Survival (Penguin Books, N.Y., 1973), p. 250.
5. Ibid., p. 347.
6. Ibid., p. 254.
7. Ibid., p. 23.
8. Ibid., p. 261.
9. Sir Geoffrey Vickers, p. 21.
10. Christopher Stone, Should Trees Have Standing? (Avon Books, 1974), p. 71.
11. Charles Lindblom, Politics and Markets (Basic Books, N.Y., 1977), p. 2.
12. Walter Lippman, quoted in Virginia Held, The Public Interest and Individual Interests (Basic Books, N.Y., 1970), p. 205.

SMALL GROUP WORKSHOPS

I. The Seafood Industry

Leader: Weston Conley

Recorder: Kitty Cox

A. Possible Problem Areas of Interest May Include:

1. Is there a lack of knowledge of the water composition (quality) in seafood harvesting areas of the Bay (what is the quality of water, how does it affect the quality of marketable seafood and seafood products, and does it impact human health)?
2. Is there a lack of knowledge of the composition of the chemical discharges into the Bay (what are the chemicals in the water, and do they harm human health through seafood consumption)?
3. Is there a lack of knowledge of the impact of the biological discharges into the Bay (what are they and do they harm human health)?
4. What is the effect of the decline of eel grasses on young marine life?
5. What is the effect of extreme amounts of chlorine going into the Bay from municipal treatment systems?
6. What are the effects of the socio-economic system on marine life in the Bay?
7. Define the effects of oil spills on the marine organisms present in Bay waters.

B. Leader's Summary of Discussion

The Seafood Industry discussion group was a small group (seven people) containing three reporters and only one industry representative, the chairman. Therefore the discussion developed differently than it might have if more industry people had been present.

1. A number of problems and possible alternatives were defined by the group. The first and one of the most important problems of the seafood industry is the water composition affecting seafood harvesting and seed areas. Specifically, an excess amount of chlorine from waste water treatment plants is a critical problem for the seafood industry. It has been proven that chlorine is lethal to oysters. Other chemicals and toxic substances are also a threat to the industry. Some suggested alternatives for solution of this problem were (1) to develop other methods of purification for both municipal waste treatment plants and point source discharges, (2) to use more land disposal of wastes, and (3) to obtain more data on actual water composition and what other substances contribute to the problem. The result of these alternatives would be to increase production of seafood resources as pollutants are reduced.

2. A second problem was defined as the lack of knowledge of other chemicals originating from both point and non-point sources. The group decided that more knowledge is necessary and that better communication of scientific findings to laymen is essential.
3. Another problem is that in order to give an overview of the significance and socio-economic aspects of the seafood industry in relation to other industries, a broader-based reporting system on catch data and associated economic value is needed. Most commercial enterprises and government agencies with grant funds tend to look at industries only in terms of economic values. In order to gain recognition of the importance of the seafood industry to Virginia, better catch data and dollar values are needed.
4. In order to obtain better management of seafood resources, better managers and better informed elected officials are needed. In order to achieve this, seafood industry liaisons with appointed and elected officials must be extended and strengthened. Thus, experienced seafood representatives could make the needs of the industry known and have input into the making of policies and setting of goals for the industry.
5. Another problem that is very prevalent in the seafood industry today is the shortage of labor for such tasks as shucking oysters and picking crabs. Efforts to mechanize these operations have fallen short due to regulatory matters that would have to be solved by the General Assembly. If these matters could be cleared up and mechanization introduced, the industry's labor problems would be at least partially solved.

Overall, most of the problems of the seafood industry could be solved by a combination of the following three alternatives: (1) public education and awareness of the industry and its problems through news releases, forums, public meetings, school programs, field trips, etc.; (2) better communication between the industry and both the general public and elected officials; and (3) more knowledge in usable form in many areas affecting the industry.

C. Full Conference Discussion

- K. Sullivan: Is the Virginia legislature sensitive to matters relating to the seafood industry?
- W. Conley: In the past four years, the industry has attempted to educate them. The Chesapeake Tributaries is a governmental committee with which we are most involved. They have several study commissions. Mr. Cranston Morgan serves as an advisory member of the group. VIMS (Virginia Institute of Marine Science) distributes information to them. They seem to be becoming more familiar with the issues. When the industry met with Governor Dalton prior to his inauguration, one industry person who had never been involved in political affairs said he really felt bad.

I asked, "Bad about what?" He said, "Any time you have to talk down to a Governor instead of up to him, you have a problem." The Governor was not aware of -- and hopefully has become more aware of -- the industry situation. The Governor didn't know the term "spat" and he didn't know anything about the propagation of oysters.

On other facets of the seafood industry, he was knowledgeable. We have a legislative representative, a resident of Fredericksburg, but he has little knowledge, nor do others serving on key committees. This is a problem. We need to educate these people to our problems. Of course, everyone else is asking for legislators' time with similar problems.

The one thing that came up quite a bit yesterday was the economic impact and the availability of data to substantiate our industry output. In essence, the government needs to know what the industry value means in relationship to other industries as far as an economic basis is concerned. I think the seafood industry has been lax in reporting what the actual catch has really been and we have been the victims -- the seafood industry and the state agencies that receive support. I think the industry tries to educate legislators to the facts. We feel that this is in a little more reality in that the Marine Resources Commission do have mandated systems. I think we have a much better data base than we had five years ago.

G. Gallagher: I have observed in the Maryland General Assembly that there are a small number of legislators who, in essence, set themselves up as the experts in dealing with watermen and the seafood industry. The other legislators have a tendency to rely on them. I wonder if that isn't one of the problems, that there hasn't been an attempt to get a broader cross section of legislators educated in marine matters.

W. Conley: We see this happening. I think in assemblies you will find that members from Norfolk will specialize in ports, and maybe the seafood industry will have a few interested members, particularly from the Hampton area. The chairman of the Chesapeake Tributaries Committee is from Hampton; that really is a key committee, as well as the Commerce and Industry committee in the Senate. Of course, the Speaker of the House in Virginia is from Mathews County and wields quite a bit of power. We find they rely on maybe two or three key people. We've observed who these people rely on as their source of information, and we have tried to educate those legislators. There are many programs being implemented to try to mechanize the industry.

Maryland is a long way ahead of Virginia, as far as the seafood industry goes, in mechanization. We feel one of our problems has been the lack of knowledge by the General Assembly. Just because one or two key people don't want it, it doesn't happen. Once it comes out of a committee, usually it will carry but most of the time it dies in the committee.

G. Hagerman: Several times you mentioned education, awareness, etc. At the last Citizens Steering Committee, the need for more awareness and education was very well stated. In fact, assuming the Citizens Participation Program goes on, although there is some doubt at the moment, we have some extra funds earmarked, and I am right now seeking proposals from various agencies for a \$50,000 public awareness program. I would appreciate very much having input from you as to the target groups, how to teach them, how you would implement it. I hope you might react to these questions.

W. Conley: I mentioned to Kitty Cox that, most of all, we need civic organizations, who are always looking for good programs. And, I think, mailings to all persons in the Chesapeake Bay area, Rotarians, Lions, Jaycees, and others. A lot of these people are eager for programs, particularly where they are related closely to the Bay. I think this is one field to get into in your 4-H Clubs. Of course, I know you are working in that area, to get these people.

II. Recreational Boating and Sportsfishing

Leader: Jeremiah Valliant

Recorder: Harry Stone

A. Situation

"Surface craft that ply the waters of the Chesapeake Bay and its tributaries."

"It may appear to be incongruous to bring together the pilot of a large ship and the pilot of a small boat on one platform for the purpose of meaningful talks and conclusions; what do they have to share with each other? They both use the same water surface."

"The make-up of this panel is unique. The relationship between all the people on this panel or the groups they represent have or could have a profound effect on the individuals' decisionmaking process. We who ply the waters of the Bay think of another user as they, not we. This is normal. We get so close to the woods we cannot see the trees."

Possible problem areas of interest may include:

1. People's right to use the Bay.
2. Impact large ships and small boats have on each other while using the surface of the Bay and its tributaries.
3. Role of boat manufacturers, boat dealers, and marina operators in personal decisionmaking.
4. Role of the commercial shipper.
5. Role of the respective states and the federal government.
6. Shoreline erosion.
7. Federal regulation 543.

B. Leader's Summary of Discussion

1. Problems created by individual decisions:
 - a. Bay congestion adjacent to tributaries with a high concentration of boat mooring facilities;
 - b. Competition for the use of same areas for competitive sports, fishing, and anchoring;
 - c. The apparent lack of compassion and courtesy on the part of boat operators, especially in planned contests and cruises;
 - d. Reckless operation, damaging wake, etc.;
 - e. Increased shore erosion created by high wakes in confined waters;
 - f. Lack of participation by boat manufacturers, boat dealers, marinas, and liquor manufacturers in safety education, etc.;
 - g. Economic impact created by uninformed operators of the smaller vessels in the same surface areas with large transport ships;

- (1) organized sail boat races
- (2) organized power boat contests
- (3) individual operators
- (4) tug boats with tows

(NOTE) Daily cost of large transport ships vary from \$15,000.00 per day to \$100,000.00 depending upon the size.

The requirement that scheduling of large transport ships must be arranged days in advance. Any delay in estimated time of arrival is costly. The dockside crew average \$700 per normal day's operation. Delay of arrival of large transport ships necessitating overtime can greatly increase costs.

Large transport ships that use heavy oil for fuel must switch to diesel fuel when they enter confined waters in order that maneuverability can be improved.

- h. Government use of waters of the Bay
 - (1) target practice
 - (2) explosives
 - (3) electrified guy cables
 - (4) restricted areas by regulation and licensing
- i. Enforcement of existing laws and regulations
- 2. Alternatives available to aid in solving the problems:
 - a. Stepped up enforcement;
 - b. Restricted use of certain areas;
 - c. New regulations;
 - d. Set up demonstrations in congested areas;
 - e. Introduce courses through the public school systems;
 - f. Request participation by boat manufacturers, boat dealers, government agencies, and liquor manufacturers in funding educational programs through T.V., news print, speakers from knowledgeable organizations, posters, literature, etc.;
- 3. Incentives to assist with the individual decision process:
 - a. Major possible incentive that presently exists appears to be fines as the result of more concentration by law enforcement;
 - b. Other incentives will have been devised through merit awards, etc.;

(NOTE) Incentives appear to be difficult to get a handle on.
- 4. Courses of action to change individual behavior:
 - a. CPCB, Inc. uses its good offices to make sure that as many people as possible are made aware of the need for action, on their part or on their organization's part, in the way

- of educating the Bay users as to what their decisions are doing to make problems (literature and speakers bureau);
- b. Have yacht clubs and boating associations move their starting lines and race course buoys to less congested areas;
 - c. Inform cruising clubs of the problems and potential hazards they are creating from their wakes when they are in close quarters or in concentrated fishing fleets;
 - d. Associations of Pilots will relate their story to civic clubs, fraternal clubs, yacht clubs, schools, etc. upon request;
 - e. Combined forces of marine advisory services, coastal zone management, and like agencies of both states in funding concentrated T.V. spots, radio programs, and other teaching methods through the communication media;
 - f. Call on state school boards to add safe boating courses to their curricula;
 - g. Insist on boat manufacturers, boat dealers, fishing gear manufacturers, and dealers being a part of the funding and educational process;
 - h. Liquor and beer manufacturers and distributors be tapped for funds and educational programs in view of their contribution to the Bay problems;
 - i. Insist that state departments of economic development become involved in creating incentives for better and safer use of the waterways, along with promoting more tourism and travel;
 - j. Continual pressure on the military to curtail the use of the Bay for bombing practice, etc.;
 - k. Last and least desirable, further restrict by zoning the use of the Bay and/or finally by absolute restriction of any additional growth of use oriented to the Bay;

(NOTE) The rapid increase in the number of people competing for the use of the Bay, "in common," so to speak, requires and dictates immediate action by all concerned.

C. Full Conference Discussion

- J. Gallagher: During sail boat races, do you see a possibility, as geography allows, for encouraging sailors to break with tradition and set up a slightly different course on which to sail. We are glad we sail out of the Magothy.
- J. Valliant: That is a good question. We spent quite a bit of time on whether to zero in on the area off Annapolis. Some kind of demonstration would be useful. We talked about it and it may develop. Mason Shehan, Department of Natural Resources, is not only a good

sailor, but he is also a part of the State of Maryland administration. He is developing a courtesy program. The tradition is a big problem. Sailors have been starting at Buoy 2 since the year one. They have been going around a buoy off the Patuxent River. We've got to break that tradition through some means that is compatible. I think with all the forces available either through the associations of transporters, and shippers. We don't want to change sailing patterns by regulation. We'd like to do it by appeal and by education if possible.

J. Gallagher: Since people are sensitive to over-regulation, I wonder if it would be good to get a resolution to the Department of Natural Resources, saying CPCB requests a change in sailing patterns. It is a citizen request to make it a little sweeter.

J. Valliant: We will consider that. Is a real hot issue to come as a news flash?

G. Hagerman: I keep hearing all these great sums of \$15,000 - \$100,000. Have you seen this CPCB folder that we prepared, "Who Needs the Bay"? It would be very simple to produce one on the various people who use the surface of the Bay. I want you to know that for between \$5,000 and \$6,000 you can get 25,000 brochures. I don't have that kind of money in my CPCB budget, but maybe some of the surface users could develop a brochure. I would be pleased to coordinate it.

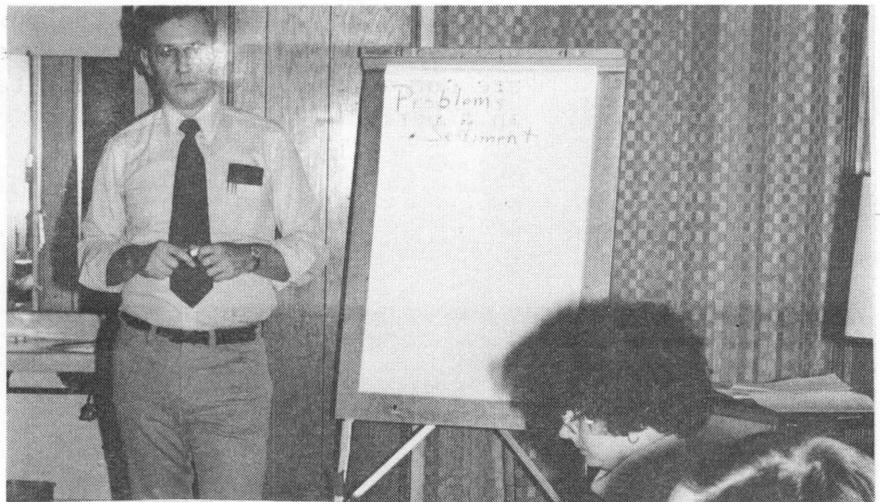
J. Valliant: We have gotten the commitment from most of the people here who are interested in working with it.

J. Witten: We discussed in our panel the same type of issue. If you are a hunter, there is a field ethic. You learn how to handle your gun and how to behave. If you don't play the game according to the accepted practice, other hunters will either never ask you to hunt again or they may ask you to leave the field. And the same ethic exists in golfing. It has its body of tradition, ethics, courtesy, and behavior. As a sailor, it seems very odd to me that sailing organizations have never developed a practical professional or sportsman's ethic about what they are doing. I read a great deal and I go to lots of meetings. I have never seen in yachting, cruising, or boating a very succinct statement of the courtesies.

An ethic should include operations on the water from a standpoint of rules of the road, with disposal practices overboard, and on tying your halyards so they don't keep everybody within 300 yards awake all night, etc. There is a real opportunity to

develop a very succinct and brief statement of the courtesies, ethics, or accepted behavior in a number of fields that could then be developed and published. Everybody is sending out newsletters or some kind of information but there is a terrible void there. It seems to me that we haven't developed a very simple list of do's and don'ts about how you operate on the water in order to be courteous to the guy next to you and for the good of the waters themselves.

J. Valliant: There have been many procedures compiled by different organizations. Our problem is that they have not been concentrated where there is money to disseminate it. Potential supporters are in the public school system, the boat manufacturers, and the boat dealers. We should ask them to do it. The power squadron people, the Coast Guard Auxiliary sadly violate rules. Many times these cruisers show the power squadron flags on them or they have Coast Guard Auxiliary flags. This is a sad commentary but they don't practice what they preach all the time. I am not condemning them, they do a great job overall. I am a member of the Auxiliary and a member of the power squadron. I am proud of the fact, but there is always 10 percent that are not worth a hoot. It only takes a few bad apples in a barrel.



III. Property Owners and Shoreline Users

Leader: E. Gordon Riley

Recorder: Jack Witten

A. Possible Problem Areas of Interest May Include:

1. Shoreline erosion and debris.
2. Development and road construction.
3. Marinas -- commercial, community, and private piers.
4. Boat operation and maintenance pollution.
5. Mooring buoys, anchoring, and swimming platforms.
6. Storm drains, sewage disposal, and septic systems.

B. Leader's Summary of Discussion

The panel included twelve participants of various backgrounds, about half from Virginia and half from Maryland. Planners, developers, housewives, coastal zone management, and others were represented.

There was initial agreement that individual property owners usually have difficulty in relating their activities to any impact on the very large Chesapeake Bay. The damage to Bay tributaries, attributed to individuals and property owners, is more visible and readily understood. Because population density near the tributaries far exceeds the density along the Bay proper, the problems created by people are most evident in those tributaries. The welfare of the Bay is, to a large extent, dependent upon the waters of the tributaries.

1. The highest priority problem suggested appears to be sewage disposal. Septic system failures have received much publicity as a major contributor to the degradation of tributary waters. Health departments regard septic systems as a temporary measure and frequently require provisions for a duplicate septic system before issuance of the initial permit.

The first alternative proposed was the preparation of a small pamphlet for the home owner with instructions on the care and maintenance of septic systems. Basic information such as the size and/or number of septic tanks needed to properly serve the number of bathrooms and the family size, plus the suitable length of drain-field for the type of soil, should be included. Primary emphasis, however, should be given to the "do's and don'ts" such as: do not allow laundry bleach to enter the septic tank because it kills the essential bacteria. If bleach must flow into the septic tank, be sure to flush a packet of yeast into the tank the very next day to restart the bacterial action. Do not flush any grease or fat down the drain if possibly avoidable. Grease and fat solidify when cooled, tend to clog pipes and form a thick crust on top of the liquid in the septic tank, which decreases bacterial action. Do not have a septic tank pumped out unless absolutely necessary. Check it for the depth of solids in the tank bottom. If solids are six to eight inches or less, the tank is working properly.

If pumping is essential, flush one packet of yeast into the tank each day for three to five days to again begin the bacterial action.

The pamphlet with these and other tips should be made available to home owners using septic systems through local health offices, real estate personnel, libraries, etc. Local authorities should be urged to require all builders of properties utilizing septic systems to give such a pamphlet to the buyer.

A second alternative suggested for properties not served by public sewerage was to encourage the approval and use of some of the newer technology systems such as aeration, evaporation, etc. It was indicated that considerable resistance by health officials has been experienced in attempts to obtain permits to install such systems. Perhaps approval would be forthcoming if provision for an already approved system were included as a back-up in the event of failure. It was also suggested that some universities could serve as a neutral source to evaluate test results of new systems and certify their function and reliability to the health authorities.

The effluent discharged into the Bay and tributary waters from public sewage plants is a further problem. Raw sewage overflows and chemicals used (particularly chlorine) are of great concern. Here again several technology alternative systems were suggested to eliminate the problem. Experience of those on the panel indicates undue difficulty encountered in convincing both health and sanitation authorities to seriously consider alternate methods. Perhaps political activity to insist that chemical and/or biological personnel be included in sanitation and health organization managements could change the attitude experienced.

The economic benefits which appear available from the use of many of the alternatives suggested are considered sufficient incentive to encourage their use. Present sewage disposal systems are considered a major source of pollution and those responsible for design, installation, and administration are believed to inexcusably resist available alternatives. Citizen group activity at all government levels appears required to obtain desirable progress.

2. A second problem identified is somewhat more complex. It involves the conservation of energy by individuals to reduce the requirement for public services which impact on the Bay and tributaries. A multiplicity of individuals could save sufficient electricity to reduce the size and number of electrical power plants required. Garbage composting by individuals would reduce landfill needs and also reduce the polluting water run-off from those landfills. Disposal of used oil at gasoline stations for re-cycling would reduce the quantity of new oil refined and also greatly reduce oil seeping through the ground or reaching the water via storm drains. Individuals can further assist by using the minimum possible quantity of commercial fertilizers and weed killers on their lawns to reduce run-off directly into the waterways or indirectly from storm drains and streams.

Education of the public by the schools and television were considered methods which may be utilized to convince individuals of the benefits for the Bay and the financial savings for themselves available by such actions.

3. Availability of the Bay and tributary waters to the public was another problem presented. It was suggested that waterfront property owners seem to regard the waterway which they face as their own and resent encroachment by others. Opposition to development of wooded areas on the opposite side of a waterway was reported as being considered an intrusion on the "aesthetic rights" of the waterfront property owner. In response, it was noted that waterfront property owners may be more knowledgeable concerning the effect of development and increased population on the waterway because of visual evidence. Those individuals residing on the waterfront see the gradual and continuing degradation of the water directly attributable to sediment run-off from development, erosion from increased boat traffic, debris from a careless and thoughtless public, the reduction of tidal flushing caused by piers, moored boats or other obstructions, and the trash and pollutants emerging from storm drains. These and many other visual confirmations of contamination are seldom perceived by the general public.

An alternative to attitudes virtually defies description. It is a fact that the tidewater belongs to all to use and enjoy, but it is also a fact that abuse of the waterway and its shoreline destroys the enjoyment for all. The only solution suggested was education through schools and organizations to the awareness and desire for positive action.

4. Erosion control was submitted as another serious problem. Discussion centered on erosion of individual waterfront properties where bulkheading is frequently used. Where a long, high bank shoreline exists and is divided into several waterfront properties, bulking of one property may cause more severe erosion of adjoining properties.

One alternative that has been tried is to prohibit bulkheading and to require a long set-back for any buildings to allow for natural erosion. It was suggested that in a few instances that solution may be advisable but in the majority of cases, bulkheading of the entire high bank area is preferable.

Several suggestions were made for incentives for individual property owners. One idea being explored is an equitable allocation of erosion control costs between the property owner and the county and/or state. Determination of an equitable division of costs is being studied. Another suggestion was a tax incentive for the property owners to make continuous bulkheading economically attractive. There was no consensus as to the best method, but it was agreed further study and some action is necessary.

Various other items were discussed in less detail. Included were exploring the feasibility of zoning waterways for conflicting uses, convincing shoreline property owners to remove and properly dispose of debris from their waterfront, maintaining citizen interest in civic activities at times not involving a crisis in their area, and urging property owners to seriously challenge the findings in environmental impact studies prepared for proposed developments in their counties.

In almost every instance, education was decided to be the primary and most effective tool. The challenge to CPCB seems to be to develop the most expedient way to inform the general public of the personal benefit to each person to be gained by the actions he or she may take, which, at the same time, help attain Bay and tributary conditions to permit biological productivity for a living Bay.

C. Full Conference Discussion

- J. Valliant: My question and concern is about any discussion or any thoughts in your small group for a substitute for chlorine and the chlorination of water. We have chlorine in drinking water and in sewage. In many cases, chlorine is lethal. Can't we find another way to treat water, not only for the taste buds but for the public health?
- G. Riley: I haven't worked on the drinking water supply. I've worked on the waster water end. I can assure you that there are at least a dozen substitutes that can be used which are effective, if not more effective than chlorine. The problem lies with our federal health authorities. I haven't been able to find a chemist in the federal government. They're all civil engineers and they're going along with what has been done in the past. Believe me, I have been frustrated time and time again sitting there with qualified medical doctors and chemists. These professionals have shown the health authorities that alternatives are safe, it will work, and there are demonstration systems that have been used. The problem is getting approval for use by a municipality. It is difficult in the lower part of the Bay or the lower part of Anne Arundel County -- where a very low shoreline, low percolation, and high water tables exist -- to get an alternative approved. Hopefully, I have seen, in the four or five years, a slight change. Government officials are beginning to look at alternative systems. I guess it all takes time. It took public officials 100 years to come up to using the systems they are using now. Hopefully, it won't take 100 years to get away from it.
- J. Valliant: Are you saying it is health department approval or disapproval? Is it a bureaucratic problem?

G. Riley: It's a bureaucratic problem altogether. Consider your normal grants that EPA puts out for municipalities for sewage plant development. EPA people told me when I raised questions about their activities, that EPA is so busy handing out grants they have no time to inspect installations to find out whether the contractors followed their specifications.

J. Gallagher: Would you cite a place in Alaska where an alternative disposal system is being used?

G. Riley: This is a system installed eight to ten years ago. In Alaska, water coming out of the tundra is perfectly good drinking water, but it looks like tea. It's not too palatable, particularly when you try to make coffee out of it, or try to mix a drink with it.

There was a system developed for use in Alaska for total recycling. Of course, all the food you eat contains some water, so the system started with only 5,000 gallons of fresh water in the tank for maybe 30-35 homes. As the sewage came out of the house, it was run through a non-coherent microwave system which raises the temperature of the water very, very quickly, and very quickly kills any organisms. Bacteria, as I understand it, can exist in temperatures up to maybe 300° and down to -100°, but they cannot stand a temperature change of 15° in one minute. If you change the temperature of the water from 60° to 200° in a matter of 10 seconds, which you can do with a non-coherent coil or a microwave oven, it kills the bacteria and viruses so you come out with a dead compound. Put the compound into a centrifuge which spins out all the solids, recover the water, incinerate the solids, and through a normal water purification plant activity, put it back in the home for reuse.

This is a perfectly logical system that has been used for years. We tried to put that system around the county, but not to recirculate the water back into the home. The leaders in the county felt that nobody would buy that idea. What we wanted to do was put it through the purification system and pump it through the ground to recharge the ground water. The benefit was to not dispose of anything. We could not get the system approved. We went through all of the health authorities and talked to the surgeon general of the United States. He was the one who told us, you can't assume that you kill it. There are all kinds of systems. That was only one. The problem is just one of getting going with it.

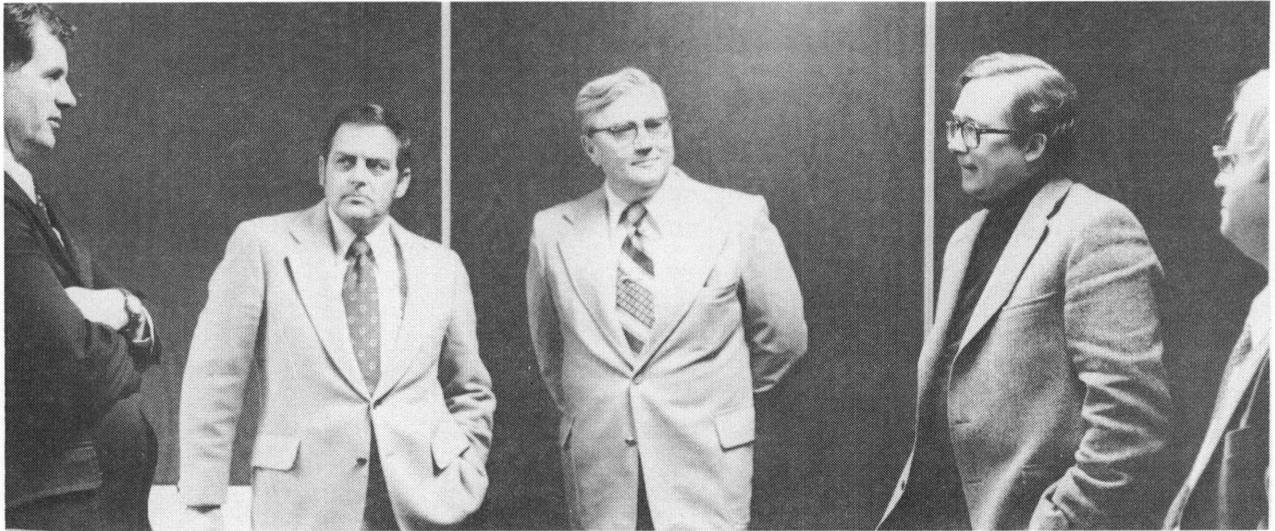
C. Morgan: There is a chlorine task force in the Commonwealth of Virginia that has been operating for about five years. The studies done by that group have resulted in Maryland making regulations concerning the amount of chlorine. This has lowered the chlorine residuals tested in various

places. Gordon was right about the engineer. In our case, the state sanitary engineer was trained in a certain way to chlorinate whatever they would need to be sure that they had neutralized the sewage, and this was a normal and good concept. Now, we are trying to educate these people. It is painful and very difficult. We have reduced our chlorine in the Commonwealth of Virginia in many places down to about one half. We are at least improving on it. VIMS did a study on bromine. This was more effective than chlorine, but it is more costly. This is where we are on chlorine. The results of what we did in Virginia are more apparent in Maryland than they are in Virginia due to our political climate. The 1972 Clean Water Act resulted in industry rushing to get into municipal discharge systems. In other words, there is quite a bit of difference in NPDES and doing your own thing. The real source of our trouble is what goes into municipal systems, and the management and the competence of the personnel operating these systems. As Gordon said, municipal system operators are not chemists. In our local area, we have a plumber operating our brand new system. It is a very costly system with an electronic dispensation of chlorine. It has never worked.

G. Riley:

There is one thing that has annoyed me for a long time. Let's for a moment assume that chlorine is essential. It takes a very, very small amount of chlorine to do the job it is supposed to do. A lot of it is overkill. When we got into the space program, for example, it takes a very, very small amount of force after a capsule is in space to move it. One of the problems that arose was with rocket fuels. They are not consistent enough for you to take two drops of that fuel and let it burn and put out the thrust because sometimes you would get not quite enough thrust, other times you would get too much. The consistency of the fuel you could buy wasn't good enough to control it with the accuracy you needed. They put a measure on the back of the rocket to find out how much thrust you were getting. They measured the exact thrust. Engineers put in very small amounts, 1/10,000 of a drop at a time, but at a very fast rate so when you reached the amount of thrust you wanted, you cut it off. It didn't make any difference what the consistency was, you were measuring output, not input. It would be so simple to design the equipment in all of these treatment plants to measure what you are getting as output. So, cut off the amount of chlorine you put in at that point automatically, so that you never overload it.

Instead of employees opening a valve until he thinks he has got enough chemical in and then shutting it off, it is very simple to make it automatic. You can make things foolproof. You can go a long way to take care of that sort of thing by simply measuring what you have in the output. You eliminate this stuff of over-kill.



IV. Commerce and Industry

Leader: Cranston Morgan

Recorder: Fran Flanigan

A. Possible Problem Areas of Interest May Include:

1. Absence of industrial and commercial persons on environmental panels and forums
 - a. Industrialists are frequently targets of the day
 - b. Industrialists are not taken seriously with their programs
2. Marine industries are fragmented and frequently lack dialogue among their leaders. (For example, dischargers, shipping agents, pilots, barge and tug operators, port and terminal operators, agricultural interest, etc.)
3. Waste disposal - point source much more tightly regulated through NPDES than non-point discharges (frequently exempt).

B. Leader's Summary of Discussion

1. Industry has not been represented because Citizens Program for the Chesapeake Bay, Inc. meetings have been top-heavy with environmentalists who take pot shots at the few industrialists present. Industrialists should come from local Chamber of Commerce members. Officers of the local Chambers should be requested to designate industry people that could better tell the story. Industry has spent billions of dollars in pollution control and it is not being told to environmentally oriented groups. Leaders of industry use the Bay for esthetic purposes too and desire a clean, viable Bay. Industry leaders should be involved in Bay problems and efforts to resolve those problems. CPCB, Inc. should make clearly known that the organization is a forum for industry users as well as other users.
2. Oil industry problems:
 - a. Industry has no control over either raw product or finished product transportation.

The greatest danger from the industry is the multiple delivery systems and there is very little oil people can do to require proper equipment, properly trained personnel, or procedures for reducing the chance of spills. The vessels that deliver oil from the large tankers are supposed to be inspected and controlled by the U.S. Coast Guard, who do not have the authority nor the personnel to carry out inspections and training that would reduce the accidents. Most at-plant spills have been eliminated.
 - b. Waste disposal

Disposal of a thick sludge was a great problem and in the past various methods were used in its disposal -- none too satisfactory. Several years ago they began a new method, dumping the sludge on a 20-acre tract; then began a sequence

of tillage that exposed the sludge to the bacteria of the topsoil. As sludge was dumped in one section, the past section was tilled. By the time the last part of the twenty acres was used the bacteria had eaten the sludge of the first part so they could begin the process over again.

The disposals of caustics was the next problem. The normal disposition was to pump it back into the tankers to be pumped over in the ocean on the trip back to the loading point. This was stopped by the Coast Guard and a new disposal method had to be devised by their research people. About a year ago they began a tertiary treatment in an enclosed system that completely takes care of the caustics.

c. Customer usage

Once oil products go to the customer, industry loses any control of disposal. For instance, an increasing amount of crank case oil is changed by private persons (increased cost of oil may have caused this condition). This changed oil has found its way into storm drains and sewage systems. Other products go into sanitary fills and even down drains to municipal systems. One possible solution is to provide incentives (such as monetary) for recycling. Service stations now pay five cents per gallon for crank case oil in the Baltimore area.

d. Government regulations and controls

Profound statement by Mr. Clark: "When bureaucracy becomes large enough, it becomes a constituency whose main function is self-perpetuation."

Industry is subjugated by costly and government-chosen priorities. This has resulted in lack of capital generation that market place prices would have taken care of. Consumer demand is the real criteria for all management decisions; these occur on a daily basis and they do sometimes affect ecology. His refinery is assigned so much capital by the parent company, and all large and small decisions are based on the money priority. Bay preservation may not be top priority.

e. Conservation and research in other energy sources

We must curtail use of oil. The public must be informed that there is a known limit to sources of oil. That wells were only tapped for 20 percent of the oil and now by technology 40-60 percent of the same wells are relieved of their content.

This costs much more money. Industry must have more capital if research and drilling are to continue. Some oil industry companies are now seeking ways to tap solar energy and steam pressure from deep recesses of the earth. Coal must have restrictions removed so it can replace oil. Nuclear energy is a known and a prime replacement for oil use, but is being tied up by environmentalists and regulations.

Mr. Clark summed up his statements by saying, "Management efforts must be balanced to meet the conflicting needs of all users and they must be a departure from our 'business as usual' stance. They must be dynamic and new approaches in order to solve our energy problems."

3. Dr. Collins stated that in his saturation study of the Chesapeake Bay, it was his opinion (shared by many researchers) that the Bay had reached the maximum toleration point in many areas. He stated that if present management people, political and agencies, did not change to a limited "no-growth" policy in these areas, we would lose the multi-faceted use of the Bay as we now know it. The astronomical cost of restoring the dead Lake Erie was pointed out. Mr. Baker pointed out that managers of the Bay should err on the safe side in decisions concerning Bay pollution.
4. Morgan pointed out that "no-growth" did not appeal to Americans because the whole philosophy of the free enterprise system that has made us great is contrary to that and has been rejected in most management decisions. But much of the legislation in recent years has been for the purpose of planned growth. The creation of the Coastal Zone Management Act embodied that philosophy. Instead of an act-react process of locating industry and people, CZM gives us the opportunity to plan for their location. We must go from a negative viewpoint of opposing things we believe to be environmentally unsound, to a positive approach of planning for people and industry where they will do the least amount of damage to the environment. Industrial Commissions should cease their blundering efforts to locate anything that will employ people and boost the tax base of the area, to one of working with the scientific community in their deliberations. We look forward to this day of cooperation.

C. Full Conference Discussion

G. Riley: In Maryland, effective January 1, 1979, there is a very stiff fine for anyone who disposes of oil any way except taking it to a filling station. You cannot put it in your garden or any other place now. It is a law and if you are caught, there is a stiff fine. It is all to be reclaimed oil. For six months, it has been a voluntary program to get people acquainted and give the oil companies and filling stations time to get the equipment accepted. It is a law in Maryland, and you might get that going in Virginia.

C. Morgan: Gordon pointed out that for the filling stations, it was a burden to them and no remuneration to them to get to save this oil. They would do it because they have no place to put it and it is picked up. It is an expense to the service station people and it is an expense along the way. Therefore, they would probably frown on these people changing their own oil and bringing it back in. That was his comment on that.

- G. Riley: I just delivered some used oil to a filling station that told me that they get five cents a gallon for it.
- W. Conley: I was in contact with a gentlemen just last week who used an oil burning system to heat his home last year for \$14.00. He has a patent on a device that can use reclaimed oil through a heating system similar to our nozzle system. There is a patent pending, and hopefully in a very few days this thing will be in the hands of a manufacturer in North Carolina. Hopefully, it will go on the market so maybe we can buy some of that five cent oil. If it is successful, it will be a solution to that problem.

V. Agriculture and Forestry

Leader: Fred P. Miller

Recorder: Robert Hunt

A. Possible Problem Areas of Interest May Include:

1. Sediment: from both agriculture and forestry.
2. Animal waste management: BOD loading, pathogenic organisms, nutrients.
3. Nutrients: N and P losses from agriculture and forestry operations in relation to background losses or inputs, point source loading, etc.
4. Pesticides: losses from agricultural and forestry operations in relation to spills, urban sources, etc.

B. Leader's Summary of Discussion

The predominant land use within the drainage area of the Chesapeake Bay consists of agriculture and forest land. The runoff from these lands, in concert with the runoff from urban and other land uses, determines in part the water quality of the Bay. Direct inputs to the Bay from industry, boating, and other water users further influences the Bay water quality.

1. Four major problem areas were identified which impact water quality as a result of land use decisions in agriculture and forestry. These are:
 - Sediment
 - Animal wastes (nutrients, BOD, pathogens)
 - Nutrients (from soil manipulation, fertilizer, crop residues, etc.)
 - Pesticides

Under this first charge, there were two questions to be addressed:

- a. What decisions do I make that affect others?
- b. What decisions do others make that affect me?

These two questions are so interrelated that the following scenario responds to them both.

The cost/price squeeze on the farmer together with health and environmental constraints have forced farmers to intensify their production per acre in order to make a living. This increased production per unit of land is gained through the use of resources such as fertilizers, pesticides, fossil fuels, and other inputs. These energy intensive resources, when used on certain landscapes, are vulnerable to runoff losses, thereby contributing to dosages which may result in water quality deterioration. This cost/price squeeze and other operational constraints remove many options available to the farmer (such as certain crop rotations) that minimize environmental impacts. This is especially true in agriculture since the farmer does not control his own commodity prices and has no way of passing increased costs on to the consumer. Other pressures, such as absentee ownership of adjacent

farms and other competitive land uses, increase the cost of land beyond the competitive range of most farmers. As a result, taxes increase; and often vandalism, trespassing violations, and nuisance complaints increase. The stewardship of the land is often compromised since the absentee owner and others often treat the land as a speculative commodity in their hedge against inflation rather than as a productive resource.

The American public also expects a plentiful, but cheap, food supply. This desire is often translated into public policies to keep food prices low; e.g., beef imports. Other pressures on the agricultural producer include the desire of the American food buyer to obtain blemish-free or aesthetically appealing produce. Producing such commodities often requires more pesticides and other resource inputs than are absolutely necessary for certain crops.

To further minimize costs, animal agriculture has concentrated larger numbers of animals in confinement systems. Confinement yields large concentrations of animal wastes which are often more vulnerable to being washed into streams.

Except for the relatively small areas of forest harvest land, forests have essentially no detrimental impact on water quality draining to the Bay. The harvest frequency of forest lands is so low that, if best management practices are followed, little or no impact will result.

2. Alternatives available to aid in solving identified problems:

For the field crop operations and animal operations, there are technological fixes (best management practices) that can be applied to minimize the runoff impact from these land uses. However, for some of these best management practices, their effectiveness in controlling certain potential pollutants (pesticides, nutrients) is not well known. There is also the problem of establishing a base line from which the effectiveness of these practices can be measured. The agricultural and forestry community are willing to implement these practices where practical and reasonable, but are concerned about their effectiveness without an established base line for comparison.

Institutional fixes aimed at absentee owners are needed to allow the bona fide farmer to play by the same rules. For example, government-financed cost-sharing funds are often appropriated by absentee owners to enhance their land's speculative worth (e.g. farm ponds, tile drains) rather than to protect the land and maintain the land's long-term productive capacity. A more stringent accountability for the use of these funds may be necessary.

American consumers could be informed about their food buying habits so that aesthetics do not become a prominent market determinant, thereby lessening the farmers' production costs and resource inputs.

3. Incentives needed to assist with individual decision processes:

Cost sharing and subsidies have been used for years as incentives for adopting certain conservation practices. To keep the tax dollar from cycling through Washington (with its attendant high brokerage fee), perhaps we should consider tax credits (for conservation practices applied, the benefits of which will accrue mostly to downstream areas) as a more direct incentive. Technical assistance as currently offered through soil conservation districts has been effective and should continue. A strong educational program is needed to make these incentives more effective. Research data including costs of control practices are needed to aid land owners, technicians, and planners in the decision-making process.

American agriculture and the forest industry are strongly opposed to mandatory incentive programs. Therefore, cost sharing and technological incentives appear to be the main line of attacking the problem. However, the time may be right for making the land owner more accountable for such subsidies.

Other incentives include investments in research to develop alternatives in cropping systems, pest management, etc. The chemical industry might be subsidized in the initial stages of pesticide development and testing. Currently, many companies have reduced their research efforts for safer products because the investment costs, testing time, and registration procedures have proved to be a dis-incentive.

Legislation providing for the protection of prime agricultural lands has already surfaced in several states. These lands are the most productive and can accommodate high resource inputs with minimal impacts on aquatic ecosystems. It makes little sense to support publicly financed research and then compromise the research findings by applying it to marginal lands which will yield minimal returns on the investment.

4. Course of action to change behavior:

A CAUTION

First, it is necessary to establish the changes that are necessary to improve the water quality impacting the Bay. Is the same course of action necessary for farm and forest land remote from the Bay as that adjacent to it? Will society and Bay water quality be helped greatly by the expenditure of funds and the initiation of educational programs aimed at the entire Bay watershed versus only portions that may be found to be the most critical? Before such courses of action are implemented on a grand scale, we must make certain our knowledge base is adequate so that future evaluations can be made to document our progress. Otherwise we have a potentially serious credibility problem facing us in the future.

a. What can be done now?

Demonstrations in forestry and agricultural practices need renewal. Tours can be organized and sponsored by organizations to inform politicians and landowners and other decision-makers about the influence of land use and land stewardship on water quality. Organizations can form a constituency oriented toward a specific goal or serve as a lobby group aimed at legislators, educators, and others. To be truly effective, where funds, professional staff, and other resources are limited, individuals and organizations should seek out the power structure (politicians, local and state department heads, etc.) in order to maximize their clout.

b. Sources of funds

Mini grants and other funds are often available through both government and private sources. Political clout can often loosen public funds where carefully planned programs are publicized.

c. What should educational systems do to support these efforts?

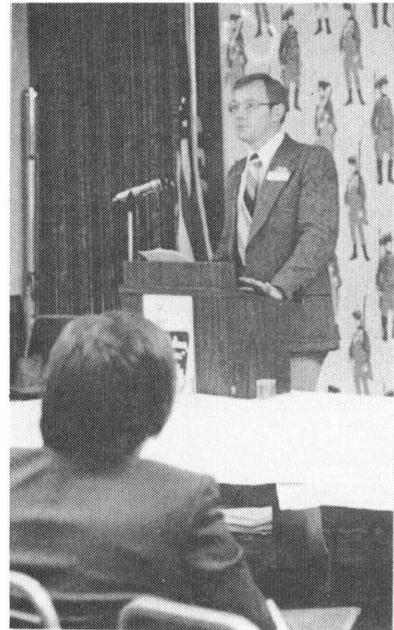
Once the need for behavioral changes are identified, the educational institutions should implement programs that show why the change is needed and clearly articulate alternatives to such behavior. A stewardship ethic must be addressed for not only current generations but future generations.

Each problem usually has a most teachable moment. For the forest harvester, this may only come once every ten to forty years. Perhaps in agriculture, we may be at one of our most teachable moments. The section 208 mandates in the 1977 Clean Water Act have precipitated an intensive educational effort aimed at farmers and other land users regarding their land stewardship with respect to water quality. This effort can and should have a positive impact on the Chesapeake Bay when coupled with the technological fixes (BMPs) that are to be implemented on the land. But the effectiveness of this effort will depend not only upon the research data base for identifying the problem and strategies for solving the problem, but also on the degree of cooperation and unity of spirit and perspective for those delegated to take our case to the public. There is no better way for the public to be "turned off" than for each agency and interest group to tell a different story and emphasize conflicting approaches to the problem of attaining and maintaining high quality water in the Chesapeake Bay.

C. Full Conference Discussion

F. Miller: I just want to say one thing in connection with soil conservation. We must get a standard method of testing, whether it be water testing or soil testing. There is one comment on conservation ditches. I am wondering how we could do something about eliminating the run-off from state highways that are starting to

connect with all of these conservation ditches. This is putting a burden on agriculture. Farmers are getting credit for causing some run-off that comes off the highways through conservation ditches that are attached to the state road ditches.



PUBLICATIONS

Citizens Program for the Chesapeake Bay, Inc. - Conference Report. "The Working Conference." University of Maryland, College Park, Maryland. September 16-18, 1971.

Citizens Program for the Chesapeake Bay, Inc. - Conference Report. "Seminar Dialogue: Public Responsibility in Chesapeake Bay Management." Extension Division, Virginia Polytechnic Institute and State University, Blacksburg, Virginia. Publication 622, June, 1975.

Citizens Program for the Chesapeake Bay, Inc. - Conference Report. "Chesapeake Bay: Uses, Choices, and Conflicts--An Extension Agents Workshop." Extension Division, Virginia Polytechnic Institute and State University, Blacksburg, Virginia. Publication 688, October, 1975.

Citizens Program for the Chesapeake Bay, Inc. - Conference Report. "The Role of a Title II Commission as an Alternative to Chesapeake Bay Management and Discussions of the Virginia-Maryland Coastal Zone Management Programs." Extension Division, Virginia Polytechnic Institute and State University, Blacksburg, Virginia. Publication 687, October, 1975.

Citizens Program for the Chesapeake Bay, Inc. - Conference Report. "Water Quality Goals for Chesapeake Bay--What Are They and How Can They Be Achieved?" Extension Division, Virginia Polytechnic Institute and State University, Blacksburg, Virginia. Publication 706, April, 1976.

Citizens Program for the Chesapeake Bay, Inc. - Conference Report. "Impact of Recent Environmental Legislations on Chesapeake Bay and Implications for Citizens Action." Extension Division, Virginia Polytechnic Institute and State University, Blacksburg, Virginia. Publication 739, October, 1976.

Citizens Program for the Chesapeake Bay, Inc. - "Bill of Rights and Responsibilities for the Chesapeake Bay." CPCB Secretariat, 1976.

Citizens Program for the Chesapeake Bay, Inc. - Membership Brochure. Printed with funds from Title I of the Higher Education Act of 1965.

Citizens Program for the Chesapeake Bay, Inc. - Information Brochure. "The Citizen and The Chesapeake Bay." Printed with funds from Title I of the Higher Education Act of 1965.

Technical Bulletin 96: "Citizen Attitudes Toward Management of The Chesapeake Bay." Leonard A. Shabman and Peter M. Ashton. Virginia Water Resources Research Center, Blacksburg, Virginia. February, 1976. Project A-059-VA, VPI-WRRC-BILL 96.

