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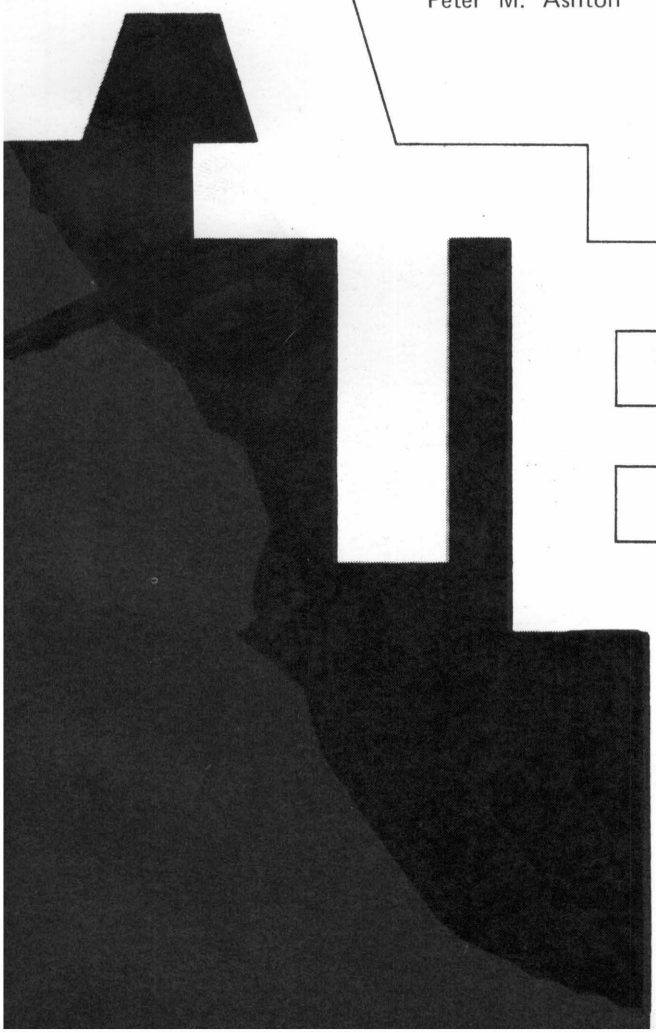

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Citizen Attitudes Toward Management of The Chesapeake Bay

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ABSTRACT

The demand for increased public involvement in natural resource planning and and management has been recognized as an important ingredient in any successful management effort for the Chesapeake Bay. As one part of this effort, a survey of Bay residents was conducted to determine how a selected group of citizens in the Bay area felt about current issues facing the Bay.

The respondents were not representative of the general population of Maryland and Virginia. However, they were representative of the citizens of the Bay that were deemed most likely to become involved in a public-participation effort. In comparison to the general regional population, the survey respondents earned higher incomes, were more highly educated, were professionally employed, and appeared to be heavily involved in public-service activities. Further, the respondents tended to display an "environmentalist" bias toward the Bay.

Despite these attributes, the respondents did not feel well informed about the ongoing Corps of Engineers study nor did they feel familiar with the Maryland and Virginia coastal zone management programs, which are the three major planning efforts now being conducted on the Bay. The two state coastal zone management programs are relatively new efforts while the Corps' program has been ongoing for some time.

Respondents expressed mild dissatisfaction with current administrative, legal, and management programs. However, there was little expressed desire for passage of new laws or for creation of a single management agency for the Bay as a whole.

The respondents' perception of the public role in Bay management indicated a fairly strong concern over what they saw as general public apathy toward the problems of the Bay. However, the respondents felt that the public did have reasonable access to the decisionmaking process. This apparent discrepancy suggests that the respondents had an atypically strong sense of urgency about the Bay problems and sought to have this sense of urgency gain broader public recognition.

Respondents were better able to evaluate the importance of specific problems facing the Bay and its users than to evaluate broader management issues. Thirteen specific problems, frequently mentioned in public discussions about the Bay, were ranked in importance by the respondents. In both Maryland and Virginia, waste disposal, bilge dumping, wetlands preservation, offshore oil development, dredge-material disposal, and power-plant siting were identified as issues of major importance. In Virginia, the status of the commercial fishing

industry was ranked as a more important problem than was the case in Maryland. Several problems received substantially less emphasis. There included runoff of pesticides and fertilizers, shoreline, erosion, population growth, and improvement of public access to the Bay.

General implications drawn from these results include: (1) any organization of citizens probably will tend to represent only limited aspects of public concern, and (2) agencies should expect to deal with a less than representative socio-economic cross section of society in their public-participation programs.

INTRODUCTION

"The noblest Bay in the universe" was the way the early English settlers in Jamestown described the Chesapeake. In 1608, Captain John Smith, after exploring the Bay, wrote: "Heaven and earth seemed never to have agreed better to frame a place for man's commodious habitation." Since those early times when it was the major route of commerce for the colonial tobacco trade, the Chesapeake Bay has provided an increasing number and diversity of services for those who live near its shores. It is a source of a $65 million a year seafood industry that employs nearly 20,000 persons in the states of Maryland and Virginia. It is a popular hunting ground for sport fishermen and waterfowl hunters, and a playground for sailors and swimmers. It is an important shipping lane for Baltimore Harbor, with over 100 million tons of cargo shipped annually over this waterway. However, of growing concern is that each year the Bay is used to absorb increasing amounts of wastewater, silt deposits from shoreside construction, chemical waste from industry and agriculture, oil and bilge washings from motor boats and oil tankers. Indeed, the Bay area faces increasing demands for its services, and conflicts among its users are becoming more frequent.

The Chesapeake Bay is not unique, however. The coastal areas of the United States, along with all our oceans and major lakes, are facing mounting pressures exerted by increasing population and economic development. With these problems in mind, the Coastal Zone Management Act of 1972 (P.L. 92-583) was passed by Congress and signed into law by the President on October 27, 1972. When full funding for implementation of the Act was received in December of 1973, numerous states, including Maryland and Virginia, received federal planning funds to develop coastal zone management (CZM) programs. Naturally, for both Maryland and Virginia, the Chesapeake Bay has become a major focus of the state CZM programs.

In Section 302 of the Coastal Zone Management Act of 1972, the Congress finds that

> . . . (b) The coastal zone is rich in a variety of natural, commercial, recreational, industrial, and esthetic resources of immediate and potential value to the present and future well-being of the Nation; (c) The increasing and competing demands upon the lands and waters of our coastal zone occasioned by population growth and economic development, recreation, extraction of mineral resources and fossil fuels, transportation and navigation, waste disposal, and harvesting of fish, shellfish and other living marine resources, have resulted in the loss of living marine resources,wildlife, nutrient-rich areas, permanent and adverse changes to ecological systems,

decreasing open space for public use, and shoreline erosion.

To deal with such problems, the Act, in Section 303, declares a national policy

> (a) to preserve, protect, develop, and where possible, to restore or enhance, the resources of the Nation's coastal zone for this and succeeding generations, (b) to encourage and assist the states to exercise effectively their responsibilities in the coastal zone through the development and implementation of management programs to achieve wise use of the land and water resources of the coastal zone giving full consideration to ecological, cultural, historic, and esthetic values as well as to needs for economic development, (c) for all Federal agencies engaged in progams affecting the coastal zone to cooperate and participate with state and local governments and regional agencies in effectuating the purposes of this title, and (d) to encourage the participation of the public, of Federal, state and local governments and of regional agencies in the development of coastal zone management programs.

The importance of Section 303 (d), which encourages the participation of the the public in the CZM effort, was recognized by the National Oceanic and Atmospheric Association (NOAA) [1973], the agency charged with implementation of the Act, which stated:

> Public participation is an essential element of development and administration of a coastal zone management program. Through citizen involvement in the development of a management program, public needs and aspirations can be reflected in use decisions for the coastal zone and public support for the management program can be generated [National Oceanic and Atmospheric Administration, 1973].

While the Act applies to the coastal zone in general, it provides a brief but appropriate summary of some of the major issues facing decisionmakers and users of the Chesapeake Bay. The Bay is a source of food, an arena for leisure expression, a cultural heritage, a source of employment, and a biological entity. Because of the varied and often competing alternative uses, conflicting demands for the Bay's products and services are becoming increasingly intense.

In this light, it is clear that any management plan must reflect the preferences of the users of the Bay itself—namely, the citizens of Maryland and Virginia as well as other parts of the nation. Indeed, if the CZM efforts of Maryland and Virginia are to be successfully developed, they must be fully understood, ac-

cepted, and supported by the public directly affected. Of equal importance is that the citizens themselves are included as an integral part of any effort to develop successful public policies toward Bay management.

While the respective state CZM programs have only recently begun, the Army Corps of Engineers is well into a major planning program focusing upon the Chesapeake Bay. Section 312 of the Rivers and Harbors Act of 1965 gave the Corps authority "to make a complete investigation and study of the water utilization and control of the Chesapeake Bay Basin." Authorization of $15 million for this purpose has allowed the Corps to do a comprehensive survey of the existing conditions—social, economic, physical, and biological—in the Bay area, and to work toward completion of a hydraulic model of the Bay that can become an integral part of any management program. Within the context of their program, the Corps also has recognized a need to enhance public participation.

> One fundamental principle that underlies sound planning is that everyone involved must participate. Whether his interest is in recreation, industry, the city, the countryside, power, navigation or scenery, he must participate in planning if planning is to succeed [U.S. Army Corps of Engineers, 1970; p. 6].

The recognized need for enhanced public involvement in planning has encouraged formation of a large number of citizen organizations. One such group is the Citizens Program for Chesapeake Bay, Inc. (CPCB). In a statement in March 1974, the CPCB defined its mission as follows:

> Recognizing that the resources of the Chesapeake Bay should be used according to a plan which best serves the public interest; and recognizing that there are conflicting, often diametrically opposed opinions with regard to the ways and means of achieving a comprehensive use plan; the Citizens' Program for the Chesapeake Bay, Inc.; . . . will provide a neutral forum for constructive dialogue between representatives of industry and ecology-conservation oriented organizations . . . serve as a catalyst to distill points of view upon which all citizens can agree . . . and from this develop a positive program of action for management of the Bay's resources for the best puplic use, speaking with one view toward this end.

The need to involve the public in management programs for the Chesapeake Bay and the ongoing operations of the CPCB provided a natural vehicle for an experimental public-participation effort. A survey was prepared and distributed to organizations on the CPCB mailing list. This list included groups with numerous—and often differing—viewpoints about the problems facing the

Chesapeake Bay. The broad objectives of this experimental survey were to:

1. develop a profile of the typical respondent to such a survey;
2. determine how representative of the Bay population respondents to such a survey would be, and;
3. identify and rank by importance Bay problems as perceived by the respondents.

More specifically, the experiment sought to determine:

a. the socio-economic status of respondents;
b. the geographic residence of respondents;
c. the extent of respondents' commitment to public issues;
d. the degree of "environmentalist" bias of the respondents;
e. the degree of familiarity with the ongoing Corps and state CZM programs;
f. the level of satisfaction with the existing management situation;
g. the desire for new management institutions;
h. the role the respondent perceived for the public in Bay management;
i. the perceived importance of specific problem issues in the Bay, and;
j. for items (a) to (i), to determine if there existed a significant difference between Maryland and Virginia responses.

The survey process was meant to serve several purposes. Most immediately, it sought (1) to make the survey itself a public-participation device by providing an opportunity for a larger number of individual citizens to express their opinions about the problems and the future of Chesapeake Bay; (2) to publish the findings and inform the public about important issues related to the Chesapeake Bay; and (3) to distribute the results of this survey to officials of federal, state, and local government, as a means of enhancing their understanding of public preferences for the Bay and of actually influencing public agency management decisions; and (4) to demonstrate the feasibility of the survey approach as a public-participation device. Indeed, the planning agencies felt that the effort was well conceived for these purposes and lent their support. The head of the Virginia Coastal Zone Management Program stated:

> . . . [the Chesapeake Bay Survey] is one way of gaining an insight into what the people perceive to be the Bay's problems and man-

> agement needs. We certainly support this survey and would like to be informed of its results. The responses to the Chesapeake Bay Survey could be of great value to our public participation program and we will give every consideration to this survey's conclusions and recommendations as we proceed with the development of a coastal zone management plan for Virginia [Leynes, 1965].

An official of the State of Maryland Coastal Zone Management Program suggested that

> . . . This undertaking [the Chesapeake Bay Survey] will be of significant use to the ongoing activities and planning aspects of Maryland's Coastal Zone Program. I expect that its most direct impact will be on our public education and public participation efforts. The results should better insure that our workshops and conferences on Coastal Zone related issues are truly on target with the concerns of Chesapeake Bay citizenry [Brumburgh, 1975].

The Corps of Engineers felt that

> Public surveys, when properly conducted, can provide the water resource planner with a measure of understanding of the people's views on water resources utilization and planning. The results of the Citizens Program for the Chesapeake Bay, Inc., survey will be given full consideration in the Chesapeake Bay Study [Trieschman, 1975].

Beyond the immediate utility of the responses is a broader issue that both planning agencies and groups such as CPCB must consider: what "public" will respond to such a survey—and, by extension, will that "public" subsequently be represented through such an effort? Answers to such questions can provide a basis for discussion of issues—such as how representative can "public" input in planning be?

The following discussion outlines how the survey was developed, distributed, and collected, and discusses response rates. Then it analyzes survey findings and draws implications for the CPCB and the management programs of respective government agencies.

SURVEY PROCEDURES

After consideration of time and budget constraints, the mail was selected as the distribution and collection mechanism. Inherent in the mail survey approach were at least two problems. First was the need for clarity; respondents would be encouraged to provide consistent and comparable responses without an interviewer's assistance. Second, the survey itself, as well as the distribution and collection procedures, had to be designed to elicit the maximum response rate. Discussions of how each of these problems was addressed follow.

After formulation of the basic objectives of the survey, with the assistance of CPCB and the planning agencies, a draft survey was designed and circulated for review. The draft then was finalized and administered to a group of participants at a conference held by the CPCB. Respondents were asked to fill out the survey and also to make suggestions that would both expand the scope of issues raised and clarify the survey itself. Forty-four surveys were returned. Based upon difficulties which arose in attempting to analyze the 44 returned surveys and suggestions received, a revised survey was developed. The revision, which was reviewed by experts in survey design at Virginia Polytechnic Institute and State University, sought to expand the scope of the information to be gathered, promote ease of completion for the respondent, and elicit responses which could be simply and unambiguously interpreted during the survey analysis. In addition, copies of the survey questionnaire were submitted to relevant government agency planning officials who were requested to provide statements endorsing the concept of the survey as a public-participation device. The statements received were reprinted as part of each questionnaire in an attempt to lend credibility and officiality to the project. A copy of the survey is shown in Appendix I.

While the survey itself was being developed, the distribution process was being designed so as to be both comprehensive (representative) and effective in eliciting responses. The CPCB maintains a mailing list of approximately 450 organizations with an expressed concern of one kind or another for the Bay. These include civic organizations, business and industrial firms, conservation groups, and government agencies. This list was updated to serve as the basis for distribution of the survey. Meanwhile, the statements of endorsement for the survey referred to above were solicited and received from the Maryland and Virginia CZM programs and the Corps of Engineers. Inclusion of these statements with the survey was intended to suggest that the individual respondent's opinion would be considered by those in an official position to plan for the management of the Bay. Also included was a cover letter drafted and signed by CPCB officials, emphasizing the importance of the results of the survey.

This letter is shown in Appendix II. These measures were taken due to recognition that mail surveys often suffer from low response rates. It was hoped that the testimony from the governmental agencies and the cover letter would encourage some improvement in this respect.

Increased respondent participation also was encouraged by minimizing the costs for an individual to participate. This was accomplished by sending the questionnaire to organizations on the CPCB list and requesting that members complete the surveys at regularly scheduled meetings. Thus no special meeting had to be called for the sole purpose of filling in the surveys, and the individual respondents did not have to set aside a special time to complete the survey. This procedure also insured that the surveys could be distributed and collected with a minimum burden on the organization leaders. All postage expenses were paid to eliminate financial costs.

The distribution effort began by identifying the leaders of the organizations on the CPCB mailing list. Each of these leaders was sent a packet of materials which included:

1. A cover letter, as shown in Appendix II;
2. 10 surveys, as shown in Appendix I;
3. A pre-addressed postcard on which requests for more surveys could be made, and
4. A post-paid, self-addressed return envelope.

Paragraphs two and three from the cover letter in Appendix II describe the requested distribution and collection process in some detail:

> You are one of a group of leaders nominated by your own firm or organization, or perhaps by a friend, to assist us in this effort. We hope that you are willing to help. No obligation is involved except your assistance in distributing the enclosed survey blanks to ten members of your firm or your organization, and then collecting and returning them to the Citizens Program for the Chesapeake Bay, Inc. To make it easy for those who cooperate, a postage paid return envelope is enclosed.
>
> A wide range of citizens' opinions is desired. We hope to reach firms or industries with an economic interest, civic groups, women's clubs, youth groups of high school age or above. In fact, any citizen who is concerned with public problems or issues can help us. If you cannot reach 10 persons in one club or firm, perhaps you can contact another group and give them a chance to help.

TABLE 1

Number of Organizations on the CPCB Mailing List
By Type and Location

(The type of organization was subjectively determined. Examples of Civic groups are the Lions Club and the Rotary Club. Environmental organizations would include such groups as the Issaac Walton League. Industrial/Commercial groups and government agencies were easily identified.)

Location	Maryland	Virginia	Wash., D. C.	Other	Totals
Type of Organization					
Civic	32	30	2	4	68
Environmental	44	25	2	3	74
Industrial/Commercial	42	67	7	2	118
Government	5	17	2	0	24
Unidentifiable	57	82	2	9	150
Total	180	221	15	18	434

TABLE 2

Number of Returned Survey Envelopes
By Type of Organization and Location

(Tables 1 and 2 are not completely compatible, since the "unidentified" row in Table 2 may include some organizations which did not use a return envelope permitting their identification. Hence, this row does not necessarily correspond directly to the category "unidentifiable" in Table 1.)

Location	Maryland	Virginia	Wash., D.C.	Other	Totals
Type of Organization					
Civic	12	7	0	1	20
Environmental	11	4	1	1	17
Industrial/Commercial	7	15	2	1	25
Government	1	7	0	0	8
Unidentified	15	17	0	1	33
Total	46	50	3	4	103

Or, if you can make more than 10 contacts, please return the enclosed postcard and more blanks will be sent to you. A wide coverage of public sentiment and opinions is desired.

A total of 434 packets (or 4,340 surveys) were sent in a blanket mailing to organizations on the mailing list. Table 1 indicates the type and location of organizations on this CPCB mailing list.

The Response

A total of 617 individual surveys were returned within three months after the mailing. This represented 103 returned envelopes with one or more surveys enclosed. The 103 total returned envelopes represented 24 percent of the initial mailing of packets. Several postcards were received with requests for a total of 221 additional surveys, bringing the total number of distributed surveys to 4,561. The 617 completed surveys represent 13.5 percent of this total. Thus, two separate response rates can be identified. The response rate on the initial package distribution was 24 percent while the response rate on the overall individual survey returns was 13.5 percent. Table 2 categorizes the returned envelopes by type of organization and location.

THE SURVEY FORM

As shown in Appendix I, responses were requested on 11 major questions. Within most of these broad questions were several individual items. These questions were designed to meet most effectively the survey objectives. Each will be discussed in turn.

Question 1:

The respondent was asked to indicate why the Chesapeake Bay was important to him. This was designed as a "warm-up" question to familiarize the respondent with the survey. The respondent was to indicate the most and next most important service the Bay provided him. While the results will be presented, there is little analytical purpose to be attached to these responses.

Question 2:

The three major ongoing management programs for the Chesapeake Bay have been discussed above. In all three programs, a stated objective is to work closely with the "public" in planning and implementation of Bay-wide management programs. Question 2 asks the respondent to indicate how knowledgeable he felt about these programs. Analysis of this response should help indicate the success of present efforts to involve the public.

Question 3:

This is the heart of the survey. It appears initially as simply a long list of response items; however, the items are specifically designed to examine certain types of respondent attitudes and opinions. Six items address the "environmentalist" orientation of the respondents; three items examine respondent opinions of current management efforts for the Bay; two items focus on proposed changes in management institutions; another two seek to identify what respondents see as the public's role in Bay management; and the remainder identify the importance of specific problems. The respondent is asked to indicate the importance of each item on the scale provided, and subsequent analysis of the responses as they are grouped according to these items provides insight into the orientation, attitudes, and opinions of the respondents.

Questions 4-11:

These questions develop a profile of the respondent himself. Questions 4 and 5 examine the extent of the respondent's overall commitment to public service activities. Question 4, which asks for the number of community service organizations the individual belongs to, is designed primarily to increase the respon-

dent's understanding of how to respond to category 5, the latter being the test of the community service orientation of the respondent. Question 6 provides information on the respondent's home state. This information is important to the Coastal Zone Management efforts since it will allow each state program to have a separate analysis for Questions 1, 2, and 3.

The answers to Questions 7 to 11 develop a profile of the respondent which, when compared to standard census information, provided insights into the respondent's representativeness of the general regional population. Questions 8, 9, and 10 were initially designed to provide information on the respondent's occupational and educational characteristics. However, responses to Questions 8 and 9 did not add any insight into the analysis and were dropped. Responses to Questions 10 and 11 were used to assess whether responses to the survey varied according to the respondent's income or education.

THE SURVEY ANALYSIS

The survey analysis included several steps. First, all responses were coded onto computer cards and a simple tabulation was conducted. Ninety-four percent of the respondents who identified their homestate (Question 6) were from either Maryland or Virginia, and since the CZM programs are being conducted in each of these states, separate analyses were conducted and simple tabulations of responses for both Maryland and Virginia on all categories were prepared. In addition, the mean value of the responses to each item within each question were calculated wherever appropriate. Ranking the importance of items in Question 3 using the calculated means served as a basis for comparing the relative importance attached to individual items in Question 3 by Maryland and Virginia respondents. A χ^2 test was also conducted to determine whether Maryland and Virginia respondents responded to survey items in significantly different ways. The same χ^2 technique was used to test for significant differences in Questions 5, 7, 10, and 11.

THE RESPONDERS

It should be clear by this time that the objective of this study was not to obtain a statistically random sample of public opinion. By utilizing a list of existing citizen organizations and private and public enterprises, opinions were being solicited from groups which had identified themselves as already having an interest in and influence on public policy formation in general and Chesapeake Bay affairs in particular. Thus, the survey (1) identified the opinions of this special group of influentials, and (2) identified the socio-economic characteristics of those who might participate in a public participation effort of this type. In other words, the survey helped to indicate where and towards which "publics" public participation efforts might most effectively be directed.

At the outset, this study was formulated with a number of hypotheses, or expectations, in mind. These included (1) the expectation that the individual respondents would not be representative of the population as a whole, but would be representative of individuals who would be likely to participate in a public participation effort; (2) the expectation that individuals who join organizations and then are willing to communicate opinions about a topic such as the management of Chesapeake Bay would be high income, highly educated, white collar workers; (3) the expectation that the respondents would be involved in numerous other public service activities; (4) the expectation that the effort required to get a broader cross section of the public to provide planning input most likely will be difficult and; and, finally, (5) the expectation that the respondents would display a general "environmentalist" bias. The reasons for this last expectation have been elaborated elsewhere and need not be developed here [Shabman, 1975].

The 617 returned surveys were first examined and the proportion of responses to each question tabulated. The result of this preliminary exercise is shown in Appendix III, which is a duplicate copy of the survey. Even these gross tabulations suggested some interesting general conclusions. Most importantly, the socio-economic data collected in questions 4 to 11 confirmed the expectation that this would not be a representative sample of people's opinions. Even the most casual observation indicated that the majority of responses came from high income, highly educated, professionals. Questions 4 and 5 suggested that the respondents were generally public service-oriented individuals who devoted substantial time to community activities.

More detailed analysis of the Maryland and Virginia respondents was then conducted. In each case the result was clear: the respondents were not representative of the population of their respective states when their socio-economic status was compared to figures from the U.S. Bureau of the Census [1972].

TABLE 3

Income Distribution of Respondents by State Compared to U.S. Census Figures (Figures in Percent)

Family Income Class	Maryland		Virginia	
	Respondents	Census	Respondents	Census
Less than $10,000	13	46.1	8	56.4
$10-15,000	15	27	11	23.9
$15-25,000	37	21	33	15.2
$25-50,000	24	5	33	3.9
Greater than $50,000	6	.9	6	.6

TABLE 4

Comparison of Educational Achievement Levels Between Respondents and General Population, Maryland and Virginia (Figures in Percent)

Education Level	Maryland		Virginia	
	Respondents	Census*	Respondents	Census*
did not complete high school	3.2	47.8	2.2	52.2
high school graduate	19.2	28.5	9.4	25.2
some college	18.4	9.9	19.5	10.3
bachelors degree	16.0	7.4	41.6	7.2
graduate or professional degree	14.8	6.6	26.6	5.1
not reported	28.4	n.a.	.7	n.a.

*For all adults over 25 years of age.

TABLE 5
Occupational Distribution of Employed Respondents and General Population (Figures in Percent)

Occupation	Maryland		Virginia	
	Respondents	Census	Respondents	Census
Manager or Administrator	19.6	8.3	29.0	12.9
Sales or Clerical	9.2	26.6	4.5	23.3
Professional	44.4	10.7	36.8	15.2
Other	11.2	54.4	5.9	48.6
Housewife	10.8	n.a.	18.2	n.a.
No Response	4.8	n.a.	5.6	n.a.

Question 11, "Annual Family Income," highlighted this unrepresentativeness. Family income figures for respondents were compared to the 1970 U.S. Census figures for the representative states and the results are shown in Table 3. While there may be minor definitional problems involving (1) the precise Census definition of income versus the general concepts of income applied by the respondents, and (2) a 5-year difference in time periods, the significant discrepency between respondents and the Census data remains.

The respondents were also highly educated individuals (Question 10). The distribution of educational achievement for both the male and female respondents from each state was skewed dramatically away from the educational achievement profile for the general public. This is illustrated in Table 4.

The "Occupational Classification" (Question 8) of the respondents was also skewed away from the general population profile. It suggested a professional/managerial bias within an overall "white-collar" tendency. Question 9, "Industry of Employment," had too many missing observations to allow drawing similar conclusions. Table 5 compares the distribution of respondents' occupations with that of the total population of employed workers. It should be noted that not all respondents were employed according to standard Census definitions, since some were retired or were housewives. Furthermore some respondents may have been unsure how to classify themselves. Still the general comparison is interesting.

Responses to Questions 4 and 5 indicated that the respondents were heavily

TABLE 6

Respondents' Membership in Community Service Organizations (Percent Belonging to Each Number)

Number of Organizations	Maryland	Virginia
1	14	13
2	24	23
3	15	22
4	12	14
5	8	8
greater than 5	8	7
none or no response	19	13

TABLE 7

Time Respondents Devote to Community Service Organizations (Percent Who Spend Time)

Time Devoted	Maryland	Virginia
Less than ½ day	33	45
½ to 1 day	32	26
More than 1 day	21	17
No response	14	12

involved in community activities. While no standards for comparison are available, it does seem that the number of memberships and time spent in community services activites are higher than what might be considered "typical" of the "average" citizen. Tables 6 and 7 summarize the responses for these questions.

Clearly, the respondents to the surveys from the two states were not typical citizens. They were financially secure, professional people with high levels of education. In turn, they were deeply involved in community organizations. The responses to the rest of the survey must be interpreted in the light of this understanding. However, these results should not be surprising. It is most likely

that the profile of these respondents is quite typical of the citizen who becomes involved in public policy making. Both CPCB and the ongoing coastal management programs will continuously be dealing with a public that incorporates this socio-economic bias. Therefore, their opinions as reflected in the remainder of the survey can indeed provide guidance for understanding and developing programs of public involvement in Chesapeake Bay management.

The extent of expected environmentalist bias was another issue addressed in this survey through inclusion of six carefully selected items in Question 3. Three of these items were designed to expose any bias toward environmental preservation while three examined any bias toward general growth and development. It was hypothesized that the environmental items would be assigned a higher level of importance than the development items. The three environmental items were:

1. "Need to preserve wetlands".The focus here was on preservation regardless of cost.
2. "Conflict between profits for individuals and health of the Bay". This implied that the Bay has a meaning and integrity of its own, and that this is somehow in conflict with the process of economic use and development.
3. "Biology of the Bay is treatened". This is a scientifically unsound statement, since the "biology of the Bay" is whatever exists at any point in time. However, it conveys a general popular impression of a natural system that is threatened by man's use.

The development items were:

4. "Tax Base threatened by proposed land use controls". This suggests that environmental controls inhibit or will inhibit desirable economic activity.
5. "Need to promote economic growth in the Bay area". Here, the implication is that the environment can remain in "satisfactory" condition if more growth were to take place.
6. "Excessive costs of meeting environmental standards". This focuses upon the word excessive, suggesting that the costs of environmental controls are more than the environmental benefits being received.

The respondent was asked to rank the importance of each of the above six items on a scale of 1 to 4, with 1 being "not important" and 4 being "major importance." Table 8 indicates the percent of responses for each item that fell along the scale from 1 to 4. This is shown for Maryland, Virginia, and the two

TABLE 8

Items Indicating the Environmental/Development Orientation of Respondents

(Figures should add horizontally to 100 percent for each state and the "both" category, but a few missing responses to certain items leave the totals slightly below 100 percent. This is also true for all subsequent tables where percentages add to less than 100.)

	Major importance . . . . . .Not Important											
	4			3			2			1		
Environmental	MD	VA	Both	MD	VA	Both	MD	VA	Both	MD	VA	Both
Need to preserve wetlands	74%	62%	68%	16%	20%	18%	6%	9%	8%	1%	4%	2%
Conflict between profits and individuals and health of the Bay	62	48	56	23	25	24	9	15	12	2	5	3
Biology of Bay is threatened	70	60	65	19	23	21	7	9	8	3	3	2
Development												
Tax Base threatened by proposed land use controls	16	14	13	23	25	24	30	33	31	22	16	19
Need to promote economic growth	24	20	20	20	22	21	31	32	31	23	19	21
Excessive costs of meeting environmental standards	29	26	24	23	32	28	22	23	23	20	13	17

TABLE 9

Mean Value of Responses and Rank of Mean for Environmental/Development Items in Question 3

	Maryland		Virginia	
	Mean	Rank	Mean	Rank
Environmental				
Need to preserve wetlands	3.68	8	3.47	5
Conflict between profits for individuals and health of the Bay	3.50	6	3.24	10
Biology of Bay is threatened	3.58	5	3.49	4
Development				
Tax base threatened by proposed land use controls	2.36	24	2.43	25
Need to promote economic growth	2.40	23	2.47	23
Excessive costs of meeting environmental standards	2.64	22	2.75	20

states combined. The pattern is quite clear. The environmental items are much more important to the respondents than the development items.

The environmental orientation also can be seen in Table 9, which shows the mean value of the importance response for the environmental and development items. Also provided is a rank of importance for these items calculated from the mean value of response of all 26 items in Question 3. The high means and high ranks of all environmental items when compared to developmental items confirms the existence of the suspected environmental bias. Thus it can be concluded that the respondents were of a particular socio-economic status and had an environmentalist bias.

To further examine the argument that there was a development and environmental attitude inherent in the six items, a factor analysis was performed. The technique of factor analysis uses the computer to search for patterns in the responses that will isolate one or more underlying tendencies, that may be termed "factors." The intention is to determine if the responses to the six

items could be explained by two factors, development and environment. The attempt was most successful as the computer found two factors in the response patterns. Analysis of these factors clearly indicated that one was an environmental factor and the other a development factor and they were negatively related.

Of some importance to both CPCB and to any planning program is to discover whether there was a significant difference between the profile of the Maryland respondents and Virginia respondents. Such knowledge will help whenever a program for involving citizens must cross the state line. To look for such differences a χ^2 test was employed. This test is formulated such that the null hypothesis is that the response received from an individual on any category item is independent of the respondent's residence. The alternative hypothesis is that the state of residence did significantly affect the response received. The use of χ^2 tests and the results of the χ^2 test, in this study are discussed in Appendix IV.

The analysis suggested that there was no significant difference between Maryland and Virginia respondents in terms of income, education or occupation. On the other hand, Maryland respondents devoted significantly more time to community service activities than did Virginians. While there is little question that an environmental bias exists among the respondents, a χ^2 test was applied to the three environmental items and a significant difference in responses between Marylanders and Virginians was found. Furthermore, the environmental bias in Maryland was found to be slightly stronger than in Virginia. The three development items, however, did not show any difference between the two states. Given the profile of the typical respondent, it appears that the Maryland respondents were both more community-service oriented and had a slightly stronger environmental bias than respondents from Virginia.

OPINIONS AND ATTITUDES ABOUT THE BAY

The respondents had several opportunities to reflect upon some of the issues in management of the Bay. Questions 1, 2, and 3 of the survey examined different dimensions and are reported separately here.

Question 1

As noted earlier, there are no meaningful analytical conclusions that can be drawn from Question 1. The items listed such as "seafood" or "a job" are not comparable on any scale, and are not representative of any particular concept or dimension of opinion. Nevertheless, for completeness, results are reported in Table 10. Differences do appear between Maryland and Virginia respondents on items 1a, 1c, 1f, and 1g. However, no implications will be drawn.

TABLE 10

Responses to Question 1:

"Chesapeake Bay is important to me because it means:"

(Check no more than two. "1" indicates most important "2" indicates next most important.)"

	Maryland			Virginia			Both		
	1	2	Total	1	2	Total	1	2	Total
Seafood	17%	13%	30%	30%	12%	42%	22%	13%	35%
An historical and cultural source	4	7	11	4	6	10	5	7	12
An ecological treasure	28	16	44	16	11	27	22	14	36
A job	3	3	6	2	3	5	2	2	4
A base for economic activity	11	9	20	9	14	23	2	11	13
A natural resource	25	28	53	23	22	45	24	25	49
Outdoor recreaction	12	21	33	14	28	42	15	25	40
Other (Specify and indicate importance below	0	2	2	0	3	3	0	1	1

TABLE 11
Extent of Knowledge of Three Ongoing Management Programs

	very knowledgeable . . . . . .very little knowledge											
	4			3			2			1		
	MD	VA	All*	MD	VA	All*	MD	VA	All*	MD	VA	All*
The Corps of Engineers Chesapeake Bay Study	3%	1%	2%	21%	9%	14%	25%	24%	23%	50%	64%	59%
The Maryland Coastal Zone Management Program	2	0	1	10	3	6	25	12	17	60	82	72
Virginia's Coastal Zone Management Program	1	3	2	2	10	6	12	22	17	80	63	72

*Includes Maryland, Virginia, Washington, D.C., and all other residences.

TABLE 12

Mean Value of Responses for Knowledge of Management Programs

(Note that the possible range of values was 1.0 to 4.0.)

Study	Maryland	Virginia
Corps of Engineers	1.77	1.44
Maryland CZM	1.54	1.18
Virginia CZM	1.21	1.53

Question 2

The three major planning/management programs underway in the Bay area were listed and respondents were asked to evaluate how knowledgeable they felt about these programs according to a scale of 1 to 4, with 1 being "very little knowledge" and 4 being "very knowledgeable." All three programs involve extensive ongoing public participation components so the results shown in Table 11 are particularly interesting.

Of most interest is that in all instances responses are strongly skewed toward the "very little knowledge" end of the scale. Thus, the survey group of highly-educated, publicly-involved respondents tend to *feel* unknowledgeable about the major planning efforts going on in the Bay. The Corps study appears to enjoy a slightly better understanding than the two state CZM programs as the mean scores reported in Table 12 indicate. Both the distribution and mean value of responses show that Maryland and Virginia respondents feel equally badly informed about their own state, and the adjacent state CZM programs.

With respect to the Corps program, Maryland respondents did feel better informed than Virginia respondents. A χ^2 test indicated that the response patterns were significantly different between the two groups at the 5 percent level of significance. The location of the headquarters of the Corps office in Baltimore and the generally more visible presence of the Corps in the upper-Bay may explain this difference.

Of broader interest is the overall feeling of lack of knowledge about existing programs. At least two possible reasons may help explain this. The first and most obvious reason is that the respondents are, in fact, unknowledgeable about the programs either because the respondents themselves have been less than

diligent in educating themselves about the planning efforts, and/ or because the agencies have failed to inform the public about their programs.

A second but more nebulous possibility is that the respondents are more knowledgeable than they feel. (Recall that the question asked how knowledgeable they *feel* they are). This possibility also might have two explanations. The respondents are a highly educated group and often it is characteristic of such persons to be wary of claiming to be knowledgeable about anything. A second explanation is that current suspicion of government has prompted people to be skeptical of what they feel they know about government operations.

Several χ^2 tests were run to investigate some of these possibilities. One test showed that there was no significant difference between respondents with different education levels about how knowledgeable they felt they were on any particular management program. This casts some doubt on the explanation that higher educated people will always feel uninformed. Another χ^2 test indicated that, for the Corp's study, a significant difference in felt knowledge existed between those who spent different amounts of time in public service activities. Those who spent more time felt more knowledgeable about the Corps' program. Thus, it might be concluded that the low level of felt knowledge about the Corps program may stem from a failure of the respondent himself to take time to become informed. The CZM programs, however, did not show any difference in felt knowledge between respondents classified by extent of public service activities. This is probably due to the newness of these latter programs and hence a general unfamiliarity with them.

The preceding explanations stand as somewhat remote excuses for the low level of felt knowledge. A more obvious general conclusion is that it is unlikely that any but the most active citizens will ever feel well informed about public management efforts for the Chesapeake Bay.

Question 3

As noted, Question 3 encompasses items that seek to evaluate several different opinions and orientations of the respondents. The environmental bias attitude, derived from items in Question 3, was discussed above. Opinions about existing management institutions, the need for changes in management institutions, the public's role in Bay management, and specific problem items facing the Bay are discussed separately in this section.

Existing Institutions

Three items sought to examine the respondents about existing management institutions for the Bay. The three included:

TABLE 13

Degree of Importance of Items Relating to Existing Institutions in Question 3

	Major Importance . . . . . Not Important											
	4			3			2			1		
	MD	VA	All*	MD	VA	All*	MD	VA	All*	MD	VA	All*
Poor cooperation between Maryland and Virginia in Bay Management	44%	40%	41%	31%	33%	32%	16%	14%	14%	2%	4%	3%
Need to make better use of existing laws affecting the Bay	49	31	40	34	39	37	11	16	13	1	3	2
Excessive power of federal agencies	31	32	29	23	25	23	15	23	25	13	10	12

*Includes Maryland, Virginia, Washington, D. C. and all other residences.

TABLE 14

Means of Responses and Rank of Mean Responses for Items Relating to Existing Institutions in Question 3

	Maryland		Virginia	
	Mean	Rank	Mean	Rank
Poor Cooperation between Maryland and Virginia in Bay Management	3.27	12	3.19	11
Need to make better use of existing laws affecting the Bay	3.38	10	3.26	14
Excessive power of federal agencies	2.78	20	2.88	18

1. "Poor cooperation between Virginia and Maryland in Bay management." This reflected on the often-expressed criticism of intergovernmental cooperation at the state level [Citizens Program for Chesapeake Bay, 1975b, 1975c].

2. "Need to make better use of existing laws affecting the Bay." This suggested that the legal framework is now adequate, but there is a failure in implementation and enforcement in the Bay.

3. "Excessive power of federal agencies." This reflected a concern that the trend toward federal regulations and activity in the Bay is undesirable [Citizens Program for Chesapeake Bay, 1975b, 1975c].

The respondent was asked to indicate the importance of each item in the Chesapeake Bay on a scale of 1 to 4, with 1 being "not important" and 4 being "major importance." The percent of respondents who gave each item a given measure on the 1 to 4 scale is reported in Table 13. Table 14 gives the mean value of the responses to each item. This mean was then used to rank the item in terms of importance relative to all 26 items in Question 3.

Tables 13 and 14 indicate that interstate cooperation and implementation of existing laws, each having mean scores above 3, are felt to be important problems in both states. Excessive power of federal agencies is not considered as important. As far as rank is concerned, the problems of cooperation and implementation of laws just barely ranked in the top-half of the 26 items in Question 3. The problem of federal agency power ranked low in perceived impor-

TABLE 15

Degree of Importance of Items Relating to Institutional Change in Question 3

	Major Importance . . . . . Not Important											
	4			3			2			1		
	MD	VA	All	MD	VA	All	MD	VA	All	MD	VA	All
Need a single government agency to take leadership in dealing with the Bay's problems	36%	28%	32%	29%	29%	29%	16%	18%	17%	13%	17%	14%
Need new laws to improve Bay management	31	27	29	30	23	27	19	23	21	11	16	12

TABLE 16

Means of Responses and Rank of Responses for Items Relating to Institutional Change

	Maryland		Virginia	
	Mean	Rank	Mean	Rank
Need a single government agency to take leadership in dealing with the Bay's problems	2.92	18	2.75	21
Need new laws to improve Bay management	2.89	19	1.69	22

tance. In general, while the respondents appeared somewhat dissatisfied with existing management institutions, they did not rank the items measuring the importance of such problems very high.

When a χ^2 test was performed, a difference was found between Maryland and Virginia respondents concerning only the item on the need to better implement existing laws. Marylanders felt this was a more important item than Virginians did. The reasons for this difference are not immediately clear.

Institutional Change

The existence of some discontent with both Maryland and Virginia cooperative efforts and with enforcement of existing laws suggests that the respondents' willingness to attach importance to institutional changes should be examined. Frequent suggestions are made to introduce some form of compact or cooperative agreement between all state and federal agencies that have a role in Bay management as a device to improve cooperation [Citizens Program for Chesapeake Bay, 1975b]. Also a common solution to many perceived problems in recent years has been to introduce new legislation to deal with it. Two items were included in Question 3 which which examined the importance of such changes. They were:

1. "Need a single government agency to take leadership in dealing with the Bay's problems."

2. "Need new laws to improve Bay management."

Tables 15 and 16 are similar to Tables 13 and 14 and give the responses to these items. It appears that the dissatisfaction with existing decisionmaking

TABLE 17

Degree of Importance of Items Relating to Public Concern in Question 3

	Major Importance . . . . . .Not Important											
	4			3			2			1		
	MD	VA	All*	MD	VA	All*	MD	VA	All*	MD	VA	All*
Lack of influence by citizens on government decision affecting the Bay	46%	38%	41%	33%	35%	33%	12%	17%	15%	4%	3%	3%
Lack of public concern about the Bay's future	59	50	55	28	31	29	9	10	9	2	3	2

*Includes Maryland, Virginia, Washington, D.C., and all other residences.

TABLE 18

Means of Responses and Rank of Response for Items Relating to Public Concern in Question 3.

	Maryland		Virginia	
	Mean	Rank	Mean	Rank
Lack of influence by citizens on government decisions affecting the Bay	3.28	11	3.15	12
Lack of public concern about the Bay's future	3.48	9	3.35	6

procedures has not prompted a demand for new arrangements. The low importance rank of both these items (Table 16) supports this observation.

The Public and the Bay:

The respondents, as noted previously, are not representative of the general public in the Bay area. However, it is likely that they are representative of the individuals who will be part of a public participation effort in Bay management. Two items were included in Question 3 to examine the respondents' views on the public role in Bay management. These were:

1. "Lack of influence by citizens on government decisions affecting the Bay." This examined the perception of the respondents about their role in Bay management.

2. "Lack of public concern about the Bay's future." This examined the respondents' perception of whether the general public is adequately concerned over the Bay.

The results presented in Tables 17 and 18 indicate that the respondents felt that a lack of citizen influence was a problem area but not one of the top issues. This probably represented the fact that the respondents were members of an elite group within that part of the population that can and does exert influence. The feeling that the general public is not adequately concerned with the Bay was felt more strongly, as the mean scores indicate. In fact, it ranked quite high in Virginia as a problem of major importance.

A χ^2 test showed a significant difference between Maryland and Virginia re-

spondents on the question of inadequate public concern. Maryland respondents were more concerned about this problem than Virginians, although Virginians still ranked the problem quite high in importance. The reasons for this difference are not immediately obvious.

Although the respondents may wish for it, it is probably not realistic to expect much greater public involvement and concern for Bay management. They, themselves, are the concerned group, and as the survey showed, they do not see their ability to influence management decisions as an especially high priority problem. Therefore, they should expect to be the prime source of citizen concern in future Bay management activities. The onus appears to be on this particular public.

Specific Problems:

The citizen who is informed and concerned about Bay management will probably be best able to understand and rank specific problem areas in need of attention by government agencies. In fact, it is specific problem areas which focus the attention of the general public on the Bay, and form the most consistent base for attracting and maintaining citizen involvement in planning. The average citizen will become more involved in dealing with specific questions such as waste disposal, than with more general issues such as design of management institutions [Shabman, 1974]. It follows, therefore, that agencies should use citizen input as one means of identifying problems of major public concern.

Question 3 included 13 items designed to assess directly the perceived importance of major problem areas. These items are listed in Tables 19 and 20, and the results of the rankings are reported in the usual format. Selection of the particular problem items was based upon extensive reviews of literature pertaining to the Bay and discussion with members of government agencies and the CPCB.

Tables 19 and 20 contain a significant amount of information about respondents' perceptions of the most important problems facing the Bay. Both tables clearly suggest that some problems are felt to be more important than others. In both Maryland and Virginia waste disposal, bilge dumping, wetlands preservation, offshore oil development, dredge material disposal, and power plant siting are identified as the most significant problems. In Virginia the status of the commercial fishing industry also ranks as an area of major concern. All other problem areas were assigned lower importance rankings.

The items listed in the paragraph above are not only the highest ranking of the 13 specific problems, but also they rank highest among all 26 items in Question 3 (with the exception of some environmental items). This clearly suggests

TABLE 19

Degree of Importance of Specific Problem Items in Question 3

	Major Importance 4			3			2			Not Important 1		
	MD	VA	All*	MD	VA	All*	MD	VA	All*	MD	VA	All*
Disposal of industrial and municipal waste	84%	72%	79%	10%	18%	13%	3%	3%	3%	1%	1%	1%
Dumping of bilge washings and oil from ships	83	76	78	11	14	14	3	5	4	1	1	1
Need to preserve wetlands	74	62	68	16	20	18	6	9	8	1	4	2
Preparing for the impact of offshore oil development	70	75	72	18	18	18	4	4	4	4	1	3
Careless disposal of dredge material	60	33	53	25	32	27	8	14	11	3	3	3
Siting of power plants	61	48	56	22	28	24	10	15	12	2	4	4
Runoff of pesticides and fertilizers from agricultural land	47	41	45	33	27	29	12	20	15	6	7	5
Erosion of the shoreline	42	42	42	38	29	34	13	20	15	4	4	4

*Includes Maryland, Virginia, Washington, D. C. and all other residences.

Economic and environmental threats to commercial fishing	43	48	44	36	35	35	15	12	14	3	2	3
Too rapid population growth	44	30	37	24	25	25	22	26	23	6	11	8
Need more wildlife management areas	35	30	34	36	29	32	20	28	22	3	9	5
Need continued improvement in port and shipping facilities	36	33	35	25	31	27	23	22	23	9	8	8
Need to improve public assess to the Bay	17	13	17	15	20	28	32	32	31	23	25	22

TABLE 20

Mean of Responses, Rank of Response, and Rank of Problem for Specific Problem Items in Question 3

	Maryland		Virginia	
	Mean	Rank*	Mean	Rank*
Disposal of industrial and municipal waste	3.81	1 (1)	3.71	2 (2)
Dumping of bilge washings and oil from ships	3.79	2 (2)	3.73	1 (1)
Need to preserve wetlands	3.68	3 (3)	3.47	5 (4)
Preparing for the impact of offshore oil development	3.61	4 (4)	3.70	3 (3)
Careless disposal of dredge material	3.48	7 (5)	3.25	9 (7)
Siting of power plants	3.48	8 (6)	3.26	8 (6)
Runoff of pesticides and fertilizers from agricultural land	3.23	13 (7)	3.09	15 (9)
Erosion of the shoreline	3.23	14 (8)	3.14	13 (8)
Economic and environmental threats to commercial fishing	3.22	15 (9)	3.33	7 (5)
Too rapid population growth	3.11	14 (10)	2.80	19 (12)
Need more wildlife management growth	3.09	16 (11)	2.85	17 (11)
Need continued improvement in port and shipping facilities	2.95	17 (12)	2.96	16 (10)
Need to improve public access to the Bay	2.31	26 (13)	2.24	26 (13)

*Numbers in parentheses indicate rank of specific problem among the 13 problem items, while rank numbers not in parentheses indicate overall ranking out of all 26 items in Question 3.

TABLE 21

Specific Problem Items for Which Importance was Significantly Affected by State of Residence

Problem	State of Residence Attaching Greatest Importance
Need to preserve wetlands	Maryland
Siting of power plants	Maryland
Dumping of bilge washings and oil from ships	Maryland
Disposal of municipal and industrial waste	Maryland
Too rapid population growth	Maryland

that citizens identify much more closely with specific problems as opposed to broader management questions.

Of some interest is whether Virginia and Maryland respondents saw the importance of the problems any differently. Clearly there are some differences in problem rankings and a χ^2 test was used to examine this possibility. Table 21 shows the problem items where state of residence had a significant effect on perceived importance of the problem. The state which placed highest importance on the problem is also indicated. In every instance where the test showed a significant difference in felt importance, the Maryland respondents gave the item higher importance than the Virginia respondents.

CONCLUSIONS

This investigation conducted a non-random sampling of opinion about the key issues facing the users of the Chesapeake Bay. The respondents were contacted through a mailing list of organizations having an established interest in Bay management and turned out to be *not* representative of the Bay's overall population as judged by socio-economic criteria. Rather they had a higher socio-economic status than the average citizen. The CPCB and the government agencies charged with Bay management should find this result neither surprising nor disturbing. While every agency of government has a responsibility to keep the broader public informed of its activities, our political system does not function as a "town meeting." Representation of various opinions is accomplished through groups and their leaders that have both the willingness and ability to accomplish this task [Shabman, 1975]. Government agencies, therefore, should be prepared to tailor their decisionmaking system to respond to groups which hopefully represent a "balanced" viewpoint from the entire population.

On the other hand, groups which seek to have a public policy impact in natural resource management should not expect to capture a broad cross section of the public as members. These groups should also recognize that they can not be all things to all people. Membership ultimately will define itself according to the perceived specific mission of the organization, and the citizens' perceived *need* to have that given opinion represented, and the members' perceived likelihood of having their opinion successfully represented. In other words, people are not going to join an organization unless they feel that organization both characterizes and can effectively represent their opinions.

The CPCB has apparently been perceived as having an environmental orientation. At least the respondents who were willing to assist CPCB in this survey effort had such a bias. In a pluralistic decisionmaking process, agencies will be faced with numerous such groups aspiring to represent the citizens' interest. It becomes a responsibility of agencies, therefore, to recognize that any such claim from any given group is neither possible nor desirable. The agency should seek a broad range of groups as the focus of their citizen involvement efforts, including representation from other agencies of government [Shabman, 1975].

Given this perspective, what lessons are provided by the survey experiment reported here: First, the agencies and CPCB can feel relatively assured that the survey response does adequately represent the opinions of higher socio-economic status, environmentally oriented citizens. These people are a group of major significance in any coastal zone management effort and they should be duly respected in resource planning and decisionmaking.

Second, it appears that the relatively stronger level of importance attached to

specific problems as opposed to broad management questions suggests a lack of concern for the "general" issues facing the Bay. The citizen will not spend much time and effort on broad management questions since he perceives a less direct personal payoff. For example, the danger of a "misplaced" power plant has more direct appeal as a problem than the inability of state agencies to cooperate with each other. From a management philosophy viewpoint, this situation is unfortunate as it may result in undue belittlement of important fundamental issues. Nevertheless, it helps to emphasize where public participation "resources" of a management agency should be focused.

In addition to these broad statements, certain specific conclusions may be derived from the survey analysis itself. While these have been alluded to above, they bear repeating at this point.

—Despite the fact that this survey covered an atypically active, intelligent and generally elite segment of the population, felt knowledge of ongoing Bay planning programs was at a very low level even though public information and participation are expressed goals of all these programs. Public participation cannot effectively influence management and planning decisions unless the public is well-informed.

—Concern is frequently expressed that government meddling is becoming excessive. This concern was not convincingly evidenced in this study. There was only a mild dissatisfaction expressed with respect to existing governmental arrangements, although there was little apparent demand for either new or revised institutions.

—While the feeling that the general public was not adequately concerned with Bay management was voiced as an important issue, this group did not blame it on a lack of ability of citizens to influence decisions.

Each agency and organization concerned with use of the Bay may find their own insights in a careful analysis of the results. There are differences between Maryland and Virginia respondents which should be considered in any state programs, and by groups such as CPCB. The people who responded were educated and willing to devote time to public service activities. The agencies can certainly sieze upon this situation to help develop attractive educational programs for these citizens, who can understand and handle technical questions if properly informed. These citizens must be given a challenging and important role in a management program if they are to be successfully interested in and involved in planning.

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APPENDIX I

THE SURVEY FORM

PURPOSE: (1) to give a larger number of individual citizens an opportunity to express their opinions about the problems and future of Chesapeake Bay; (2) to publish the findings and inform the public about important issues related to the Chesapeake Bay; and, (3) to distribute the results of this survey to officials of federal, state and local government, as a means of enhancing their understanding of the public preferences for the Bay.

BENEFITS: (1) a chance for individuals to express their opinion about the Bay to government officials with the assurance that these officials have asked for the results.

Mr. B. C. Leynes, who is in charge of the Virginia Coastal Zone Management Program writes:

> . . . the Chesapeake Bay Questionnaire sponsored by the Citizens Program for the Chesapeake Bay, Inc. is one way of gaining an insight into what the people perceive to be the Bay's problems and management needs. We certainly support this survey and would like to be informed of its results. The responses to the Chesapeake Bay Questionnaire could be of great value to our public participation program and we will give every consideration to this survey's conclusions and recommendations as we proceed with the development of a coastal zone management plan for Virginia.

From the State of Maryland Coastal Zone Management Program, Mr. Scott Brumburgh writes:

> It is my belief that this undertaking (the Chesapeake Bay Questionnaire) will be of significant use to the ongoing activities and planning aspects of Maryland's Coastal Zone Program. I expect that its most direct impact will be on our public education and public participation efforts. The results should better insure that our workshops and conferences on Coastal Zone related issues are truly on target with the concerns of Chesapeake Bay citizenry.

From the Army Corps of Engineers:

> In the Baltimore District's comprehensive Chesapeake Bay Study, we are planning for the most efficient use of the Bay's water resources that are consistent with the people's needs and desires. Because of this we look forward to receiving information from private individuals and groups on how the Bay affects them and what problems they face. Public surveys, when properly conducted, can provide the water resource planner with a measure of understanding of the people's views on water resources utilization and planning. The results of the Citizens Program for the Chesapeake Bay, Inc., survey will be given full consideration in the Chesapeake Bay Study.

(2) A summary of results will be made available to your organization, firm or agency.

NOTE: PLEASE DO NOT WRITE YOUR NAME ON THIS SURVEY. ALL RESPONSES WILL BE KEPT CONFIDENTIAL.

1. Chesapeake Bay is important to me because it means: (Check no more than two. 1 to indicate the most important, and 2 to indicate the next most important.)

Seafood	
A historical and cultural source	
An ecological treasure	
A job	
A base for economic activity	
A natural resource	
Outdoor recreation	
Other (Specify and indicate importance below)	

2. How knowledgeable do you feel you are about the following? Check the appropriate box according to the scale shown.

very knowledgeable — 4 — 3 — 2 — very little knowledge — 1

	4	3	2	1
The Corps of Engineers Chesapeake Bay Study				
The Maryland Coastal Zone Management Program				
Virginia's Coastal Zone Management Program				

3. How important are the following items to the Chesapeake Bay and it's users? Check the appropriate box according to the scale shown.

	major importance 4	3	2	not important 1
Need to improve public access to the Bay				
Poor cooperation between Maryland and Virginia in Bay management				
Need for continued improvement in port and shipping facilities				
Preparing for the impact of offshore oil development				
Need to preserve wetlands				
Dumping of bilge washings and oil from ships				
Tax base threatened by proposed land use controls				
Need to make better use of existing laws affecting the Bay				
Siting of power plants				
Conflict between profits for individuals and the health of the Bay				
Disposal of industrial and municipal wastes				

Need to promote economic growth in Bay area				
Biology of the Bay is threatened				
Excessive power of federal agencies				
Economic and environmental threats to commercial fishing industry				
Lack of influence by citizens on government decisions affecting the Bay				
Need more wildlife management areas				
Lack of public concern about the Bay's future				
Erosion of the shoreline				
Need a single government agency to take leadership in dealing with the Bay's problems				
Excessive costs of meeting environmental standards				
Need harbor and channel improvements for navigation				
Too rapid population growth				
Careless disposal of dredge material				
Runoff of pesticides and fertilizers from agricultural land				
Need new laws to improve Bay management				
Others: (Specify and indicate importance below)				

4. How many voluntary community service or public interest groups are you a member of (examples might be Rotary, PTA, church groups, conservation groups, Chamber of Commerce, etc.)?

_____
number

5. How much time in a week do you normally devote to these activities?

less than ½ day		½ to 1 day		more than 1 day	

6. I live in _____, _____, _____
(city or town) (county) (State)

7. I am a _____ year old, Female ☐ Male ☐

8. My occupation and that of my spouse is (or was, if retired)

	MINE	SPOUSE'S
Manager or Administrator		
Sales or Clerical		
Housewife		
Professional (medical, government, legal educational, etc.)		
Other		

9. We work in the industry of (or did, if retired)

	MINE	SPOUSE'S
Agriculture, Forestry, Fishing, Mining		
Construction, Manufacturing		
Transportation		
Other		

10. Our highest level of education is:

	MINE	SPOUSE'S
did not complete high school		
high school graduate		
some college		
bachelors degree		
graduate or professional degree		

11. Our yearly family income is about:

less than $10,000	
more than $10,000 but less than $15,000	
more than $15,000 but less than $25,000	
more than $25,000 but less than $50,000	
$50,000 and over	

APPENDIX II

COVER LETTER FOR SURVEY FORM

Citizens Program for the Chesapeake Bay, Inc.

Queenstown, Maryland 21658
February 26, 1975

Dear Friend,

Fifty organizations, business firms and agencies that have an interest in the Chesapeake Bay have asked us to find out how citizens feel about the Bay--what they want and expect from it in the future, and how well it is being managed. Vast sums of public tax money are now being spent on a wide range of projects and programs related to the Bay. We want to provide information that will assist these programs in serving the public interest, however, none of this tax money is being used in support of this survey. Rather this survey is an independent effort of the Citizens Program for the Chesapeake Bay, Inc.

You are one of a group of leaders nominated by your own firm or organization, or perhaps by a friend, to assist us in this effort. We hope that you are willing to help. No obligation is involved except your assistance in distributing the enclosed survey blanks to ten members of your firm or your organization, and then collecting and returning them to the Citizens Program for the Chesapeake Bay,

Inc. To make it easy for those who cooperate, a postage paid return envelope is enclosed.

A wide range of citizen's opinions is desired. We hope to reach firms or industries with an economic interest, civic groups, womens clubs, youth groups of high school age or above. In fact, any citizen who is concerned with public problems or issues can help us. If you cannot reach 10 persons in one club or firm, perhaps you can contact another group and give them a chance to help. Or if you can make more than 10 contacts, please return the enclosed post card and more blanks will be sent to you. A wide coverage of public sentiment and opinions is desired.

We expect to summarize and publish the results of our findings but individual comments or opinions are, of course, strictly confidential.

We thank you very much for your help.

Sincerely yours,

Branston Morgan
Cranston Morgan
Chairman of the Board

Ed W Aiton
Ed W. Aiton
President, CPCB

Enclosures

APPENDIX III

TABULATION OF TOTAL RESPONSES TO CITIZEN SURVEY

TABULATION OF CPCB, INC.
SURVEY RESULTS

1. Chesapeake Bay is important to me because it means:

	1st Choice	2nd Choice	Sum
A natural resource	24%	25%	49%
Outdoor recreation	15	25	40
An ecological treasure	22	14	36
Seafood	22	13	35
A base for economic activity	2	11	13
An historical and cultural source	5	7	12
A job	2	2	4
Other (Specify and indicate importance below)	0	1	1

2. How knowledgeable do you feel you are about the following?

	very knowledgeable. . . . . very little knowledge			
	4	3	2	1
The Corps of Engineers Chesapeake Bay Study	2%	14%	23%	59%
The Maryland Coastal Zone Management Program	1	6	17	72
Virginia's Coastal Zone Management Program	2	6	17	72

3. How important are the following items to the Chesapeake Bay and its users?

	Major Importance 4	3	2	Not Important 1
Need to improve public access to the Bay	17%	18%	31%	22%
Poor cooperation between Maryland and Virginia in Bay management	41	32	14	3
Need for continued improvement in port and shipping facilities	35	27	23	8
Preparing for the impact of off-shore oil development	72	18	4	3
Need to preserve wetlands	68	18	8	2
Dumping of bilge washings and oil from ships	78	14	4	1
Tax base threatened by proposed land use controls	13	24	31	19
Need to make better use of existing laws affecting the Bay	40	37	13	2
Siting of power plants	56	24	12	4
Conflict between profits for individuals and the health of the Bay	56	24	12	3
Disposal of industrial and municipal wastes	79	13	3	1
Need to promote economic growth in Bay area	20	21	31	21
Biology of the Bay is threatened	65	21	8	2
Excessive power of federal agencies	29	23	25	12
Economic and environmental threats to commercial fishing industry	44	35	14	3
Lack of influence by citizens on government decisions about the Bay	41	33	15	3
Need more wildlife management areas	34	32	22	5
Lack of public concern about the Bay's future	55	29	9	2
Erosion of the shoreline	42	34	15	4
Need a single government agency to take leadership in dealing with the Bay's problems	32	29	17	14

(continued)

Question 3 (continued)

	Major Importance			Not Important
Excessive costs of meeting environmental standards	24%	28%	23%	17%
Need harbor and channel improvements for navigation	17	27	33	14
Too rapid population growth	37	25	23	8
Careless disposal of dredge material	53	27	11	3
Runoff of pesticides and fertilizers from agricultural land	45	29	15	5
Need new laws to improve Bay management	29	27	21	12
Others: (Specify and indicate importance below)	4	0	0	95

4. How many voluntary community service or public interest groups are you a member of?

Number of Groups	Number of Respondents
0 (no groups and/or no response)	16%
1	14
2	23
3	13
4	12
5	7
6 (or more)	8

5. How much time in a week do you normally devote to these activities?

Amount of Time	Number of Respondents
0 (no response)	15%
less than ½ day	37
½ to 1 day	28
more than 1 day	20

6. I live in: No response—4% Maryland—45% Virginia—46% Other—4%

7. Designation of age and sex: not applicable.

8. My occupation and that of my spouse is (or was, if retired):

	Male	Female
Manager or Administrator	28%	4%
Sales or Clerical	4	9
Housewife	0	40
Professional (medical, government, legal, educational, etc.)	44	25
Other	9	5
No Response	15	17

9. We work in the industry of (or did, if retired):

	Male	Female
Agriculture, Forestry, Fishing, Mining	13%	2%
Construction, Manufacturing	16	2
Transportation	5	2
Other	40	37
No Response	25	56

10. Our highest level of education is:

	Male	Female
Did not complete high school	2%	2%
High school graduate	8	18
Some college	18	21
Bachelors degree	28	30
Graduate or professional degree	33	13
No response	10	15

11. Our yearly family income is about:

	Respondents
Less than $10,000	10%
More than $10,000 but less than $15,000	14
More than $15,000 but less than $25,000	35
More than $25,000 but less than $50,000	28
$50,000 and over	6
No Response	7

APPENDIX IV

χ^2 TEST RESULTS

χ^2 TEST RESULTS

The "Chi-Square" statistic tests whether a systematic relationship exists between two variables. This is done by cross-tabulating observations on the two variables into a matrix, and comparing expected cell frequencies to actual cell frequencies. Expected cell frequencies represent the distribution if *no relationship* existed between the variables, and are computed by the formula,

$$f_e^i = \frac{C_i r_i}{N} \qquad [1]$$

where: f_e^i = expected cell frequency
C_i = frequency in column i
r_i = frequency in row i
N = number of total cases

Then $$\chi^2 = \sum_i \frac{f_e^i - f_e^i}{f_e^i} \qquad [2]$$

where: f_e^i = observed cell frequency
f_e^i = expected cell frequency

From formula [2] it can be seen that the greater the discrepency between expected and observed frequencies, the greater is χ^2. Large values of χ^2 suggest that the variables are related. In order to determine whether the values are "large" or "small," the computed χ^2 is compared to the probability of obtaining a value of χ^2 as large or larger when the variables are in fact independent. The five percent level of significance was applied to the χ^2 tests used in this study. That is, if the probability of obtaining as large a χ^2 as was computed would occur by chance only five or less out of 100 times, we felt confident in saying that the variables were related. The χ^2 test was mainly used to ask whether the response to questions was related to the respondents' state of residence. Other minor uses were considered as described in the text. The results of the χ^2 tests are shown below in Table A-IV-1. This table can be read as testing whether the response to the item in the rows varied according to the column items. If the level of significance of the χ^2 reported was less than or equal to five percent, the hypothesis of dependence was not rejected.[1]

[1] There is some uncertainty about whether χ^2, as with most statistical tests, can be employed only when drawing inferences from a sample to a larger population. In this study, the respondents were considered the population and the χ^2 test was not used for inference. This is considered legitimate by some authors. See, for example, Winch and Campbell [1969].

TABLE A-IV-1

Significance of χ^2 Comparisons

	Residence in Maryland or Virginia	Level of Education	Time Devoted to Community Service
Planning Programs			
Knowledge of Maryland Coastal Zone Management Program	.3845	.8297	.1349
Knowledge of Virginia Coastal Zone Management Program	.3205	.5959	.6575
Knowledge of Corps of Engineers Study	.0001*	.6149	.0358*
Environment / Development			
Conflict between profits for individuals and the health of the Bay	.0129*	n.a.	n.a.
Need to preserve wetlands	.0156*	n.a.	n.a.
Biology of the Bay is threatened	.3554	n.a.	n.a.
Need to promote economic growth in Bay area	.7051	n.a.	n.a.
Tax base threatened by proposed land use controls	.3342	n.a.	n.a.
Excessive costs of meeting environmental standards	.0286*	n.a.	n.a.

(continued)

TABLE A-IV-1 (continued)

	Residence in Maryland or Virginia	Level of Education	Time Devoted to Community Service
Existing Institutions			
Need to make better use of existing laws affecting the Bay	.0010*	n.a.	n.a.
Poor cooperation between Maryland and Virginia in Bay management	.3205	n.a.	n.a.
Excessive power of federal agencies	.5956	n.a.	n.a.
Institutional Change			
Need a single government agency to take leadership in dealing with the Bay's problems	.3423	n.a.	n.a.
Need new laws to improve Bay management	.0897	n.a.	n.a.
Public and the Bay			
Lack of influence by citizens on government decisions affecting the Bay	.2404	n.a.	n.a.
Lack of public concern about the Bay's future	.3239	n.a.	n.a.

Specific Problems			
Need to preserve wetlands	.0156*	n.a.	n.a.
Disposal of industrial and municipal wastes	.0314*	n.a.	n.a.
Need to improve public access to the Bay	.3845	n.a.	n.a.
Too rapid population growth	.0083*	n.a.	n.a.
Siting of power plants	.0233*	n.a.	n.a.
Dumping of bilge washings and oil from ships	.3129	n.a.	n.a.
Preparing for the impact of offshore oil development	.2853	n.a.	n.a.
Careless disposal of dredge material	.0060*	n.a.	n.a.
Runoff of pesticides and fertilizers from agricultural land	.0491*	n.a.	n.a.
Erosion of the shoreline	.0751	n.a.	n.a.
Need more wildlife management areas	.0062*	n.a.	n.a.
Economic and environmental threats to commercial fishing industry	.5086	n.a.	n.a.
Need for continued improvement in port and shipping facilities	.5237	n.a.	n.a.

*Indicates that response to row items was not independent of column items at the five percent level of significance.

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