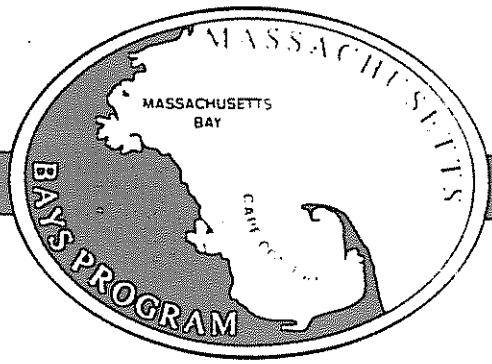


Report to the

MASSACHUSETTS BAYS PROGRAM

REVIEW OF WATER QUALITY PLANNING PROGRAMS RELATIVE TO MASSACHUSETTS BAYS

Prepared By:

Metcalf & Eddy, Inc.
30 Harvard Mill Square
Wakefield, MA 01880

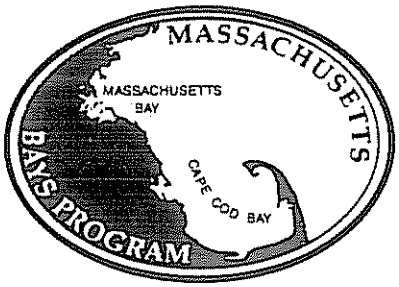
January, 1992

MBP-92-01

The Massachusetts Bays Program is a cooperative venture of the Massachusetts Coastal Zone Management Office and the U.S. Environmental Protection Agency

Review of Water Quality Planning Programs Relative to Massachusetts Bays

January 31, 1992



MASSACHUSETTS BAYS PROGRAM

Massachusetts Executive Office
of Environmental Affairs
Coastal Zone Management
100 Cambridge St., Room 2006
Boston, Massachusetts 02202
(617) 727-9530

U.S. Environmental Protection Agency
Water Management Division
John F. Kennedy Federal Building
Boston, Massachusetts 02203
(617) 565-3514

FOREWORD

In April, 1990, following a formal process of nomination, the Massachusetts Bays Program became part of the National Estuary Program (NEP). The funding provided as part of this joint program of the Environmental Protection Agency and the Commonwealth of Massachusetts is being used to continue a coordinated program of research in the Massachusetts and Cape Cod Bays ecosystem, originally funded by the Massachusetts Environmental Trust. In addition, the funding supports public outreach activities, water quality management demonstration projects, and the development of a Comprehensive Conservation and Management Plan (CCMP) for the coastal and marine resources of Massachusetts and Cape Cod Bays.

As part of the development of an evolving regional water quality management plan for the Bays, the Massachusetts Bays Program sponsored a review of past and ongoing water quality planning programs in Massachusetts. The following report discusses the Southeastern New England Study (SENE) and the 208 Planning Program, as well as eight existing programs, as they relate to the implementation of the recommendations in the CCMP. The report was prepared by Metcalf and Eddy, Inc. with assistance from the Merrimack Valley Planning Commission.

The information in this document has been subjected to Massachusetts Bays Program peer and administrative review and has been accepted for publication as a Massachusetts Bays Program document. The contents of this document do not necessarily reflect the views and policies of the Management Conference.

ACKNOWLEDGMENTS

This project was conducted with the assistance of the Merrimack Valley Planning Commission. In addition, special thanks go to:

Jeffrey Benoit, Chairman of the Massachusetts Bays Program Management Committee and Executive Director of the Massachusetts Coastal Zone Management Office

Fletcher Pyle, Massachusetts Division of Water Resources (DEM)

Elizabeth Kline, former Executive Director, Massachusetts Water Resources Commission

Martin Pillsbury, Water Resources Planner, Metropolitan Area Planning Council

Margo Fenn, Chief Planner, Cape Cod Commission

Daniel Hamilton, Publications Specialist, Cape Cod Commission

James Watson, Old Colony Planning Council

Scott Horsley, Principal, Horsley, Witten, Hegemann

Susanne McCarthy, Massachusetts Division of Water Supply (DEP)

Janet Stearns, Massachusetts Division of Water Supply (DEP)

Nancy Sullivan, U.S. Environmental Protection Agency

Robert Adler, U.S. Environmental Protection Agency

Robert Brown, former Executive Director of the New England River Basins Commission

Robert Kisvinsky, former Project Director for the Southeastern New England Study (SENE)

Mass CZM Office

Bradford Barr
Farah Courtney
Patricia Hughes
James O'Connell
Joseph Pelczarski
Laurel Rafferty
Jan Smith

Massachusetts Division of Water Pollution Control (DEP)

Eben Cheseborough
Russell Isaac
Stephen Halterman
Arthur Johnson

TABLE OF CONTENTS

	Page
EXECUTIVE SUMMARY	ii
CHAPTER 1 INTRODUCTION	1-1
Background	1-1
Scope of Review	1-1
Study Area	1-2
Focus of Review	1-2
CHAPTER 2 HISTORICAL WATER QUALITY PLANNING	2-1
Southeastern New England Study	2-1
208 Program Initiative	2-7
CHAPTER 3 CURRENT WATER QUALITY PLANNING PROGRAMS	3-1
Nonpoint Source Management Plan	3-1
Section 205(j)1/604(b)	3-7
Section 303(e) Basin Planning	3-12
Coastal Zone Management Planning	3-15
Harbor Planning	3-24
Areas of Critical Environmental Concern	3-30
Cape Cod Commission Regional Policy Plan	3-33
Cape Cod Aquifer Management Project	3-36
CHAPTER 4 CONCLUSION	4-1
The Planning Process	4-1
The Planning Context	4-2
Findings	4-7
APPENDIX A MASSACHUSETTS BAYS REGION SENE STUDY RECOMMENDATIONS	A-1
APPENDIX B REGIONAL 208 PLAN RECOMMENDATIONS	B-1

EXECUTIVE SUMMARY

INTRODUCTION

This report contains a review of water quality management and planning programs in Massachusetts as part of an overall project to improve coastal water quality under the Massachusetts Bays Program. The Massachusetts Bays Program includes in its approach the development of a Comprehensive Conservation and Management Plan (CCMP) that will provide a plan of action aimed at the protection and preservation of the ecological integrity of the Massachusetts Bays ecosystem.

The report has two tasks:

1. Review and assess the Southeastern New England Study (SENE) and 208 Planning Program (208) to better understand how effective these programs have been and why, in order to build on previous accomplishments and avoid repeating tactical and procedural errors.

2. Review and assess current water quality planning programs in Massachusetts for applicability to CCMP development and implementation and to identify potential problems and opportunities, in order to maximize available resources and avoid program duplication.

The plans and programs reviewed for this report include:

- Southeastern New England Study
- 208 Planning Program
- Nonpoint Source Planning
- Water quality management and planning in accordance with Section 205(j)1, now 604(b), of the Clean Water Act
- Basin planning in accordance with Section 303(e) of the Clean Water Act
- Coastal Zone Management Planning
- Harbor planning
- Areas of Critical Environmental Concern (ACEC)
- The Cape Cod Commission Regional Policy Plan
- The Cape Cod Aquifer Management Project (CCAMP)

The review focuses primarily on planning and the implementation of plans at the federal, state and regional levels including initiatives undertaken by the five regional planning commissions in the study area. The analysis will emphasize what the plans propose or accomplished and their relevance to the goals and objectives of the Massachusetts Bays Program and CCMP. Below is a brief summary of the findings of the reviews into these plans and programs.

SUMMARY OF FINDINGS

This first portion of this report reviews the lessons learned from past planning studies--the SENE study and the 208 Planning studies. Looking back at these studies can indicate some of their successes and failures, and assist the Massachusetts Bays Program in developing their CCMP. Following is a summary of recommendations related to the development of the Massachusetts Bays Program CCMP resulting from

the review of the lessons learned from the SENE and 208 studies.

- Prove the problem is local to get local implementation of recommendations.
- Structure local involvement so as to have chief elected officials and other local board members actively involved as equal partners.
- Structure general public involvement so that it is representative of all coastal interests (economic as well as environmental) and develops long-term leadership that will strive to implement the plan.
- Ensure that all public agencies involved with producing the plan are committed to its implementation.
- Do not separate the plan from those who will eventually be responsible for funding implementation.
- Develop the plan within the context of economic and political realities.
- Link funding incentives to the plan so that recommendations can be implemented immediately.
- Do not permit public funding of activities which are contrary to the plan.
- Provide funding for technical assistance and capacity building to ensure implementation.
- Strive to keep the project visible and credible by funding demonstrations on an ongoing basis and promoting the improvements they accomplish.
- Simplify the state's structure for implementing water quality.
- Improve coordination among state agencies that administer water quality programs.
- Ensure that there is an organizational structure in place at the end of the planning process to implement the plan, especially the inter-local recommendations.
- Maximize the use of existing agencies and resources before looking to new authorities.
- Address the issue of such a broad geographic area being needed for technical accuracy, versus loss of local ownership, by targeting funding to sub-areas that generate local or regional identities/loyalties.
- Follow up generic recommendations with strategic plans that help communities understand the specific actions they need to take to implement marine water quality improvements.
- Develop a concise, easy-to-read document that clearly spells out who should be doing what, when, and how. Avoid overwhelming the public with too many recommendations and too much detail.
- Emphasize land use planning as a preventive approach versus more costly structural solutions that are more a reaction to pollution.

In addition to the review of past studies, this report also investigates existing water quality programs for their applicability to the Massachusetts Bays Program. All of the programs investigated for this report have direct applicability to the goals of the Massachusetts Bays Program. Specifically, the Nonpoint Source Planning, Coastal Zone Management Planning, Harbor Planning, and Areas of Critical Environmental Concern programs are the most closely related to the Massachusetts Bays Program. Below is a summary of the findings of the two past planning studies and each of the eight existing programs reviewed for this report.

Southeastern New England (SENE) Study

Funded under the federal Water Resources Planning Act, a multi-state regional planning agency known

as the New England River Basins Commission conducted this growth management planning study from 1971 through 1975. The major finding of the SENE review is that despite an extensive public outreach program, many of the structural and growth management recommendations of the SENE study were rejected outright or are still being studied today. The Massachusetts Bays Program, which shares many of the same goals as the SENE program and has similar management and citizen participation structure, must be careful to avoid sharing the same outcome after its five years of work. Following are four of the primary lessons to be learned from the SENE study:

- Clear statements as to who should be doing what, and when, and why must be made.
- All pollution problems and their proposed solutions must be localized in order to achieve local buy-in.
- There needs to be ongoing and follow-up implementation funding not only to complete the work, but to provide direct one-on-one community assistance to help local officials formulate and sell local solutions to town meetings and city councils.
- Once a bylaw, regulation or other implementation measure is in place, there must be local (or regional) capacity to administer it.

208 Program Initiative

Funded under the Federal Clean Water Act during the 1970s and 1980s, state regional planning agencies developed area-wide water quality management plans for each community within their jurisdiction and for their region as a whole. Interviews conducted during the research on the 208 Water Quality Planning Program revealed a common general criticism from those involved with the program, a theme echoed throughout the Massachusetts Bays Program region. The 208 program produced good plans, stimulated important thinking, provided momentum for future work in water quality planning and initiated new programs, but did not accomplish enough tangible results to be remembered primarily for its implementation success. The Massachusetts Bays Program must pay attention to the lessons of the 208 program in order to avoid meeting the same outcome.

Members of the Massachusetts Bays Program region RPAs involved in 208 development and implementation identified reasons for the shortcomings and benefits of the 208 recommendations. Following is a list of the issues addressed by those interviewed.

<u>Shortcomings of the 208 Program</u>

- Limited Federal and State Commitment and Follow-Through
- Local Funding Constraints
- Limited Local Follow-Through
- Widely-Ranging Recommendations
- Lack of Support for Non-Structural Programs
- Duplication of Effort

<u>Benefits of the Program</u>

- The comprehensive approach was an important step in the field of water quality management.
- The program investigated water quality as part of a growth and development process.

- It anticipated future priorities and programs.
- It acted as a springboard for further water resources planning.
- It indicated the importance of flexible priorities and standards.
- The plans were developed from a local perspective.
- The program assisted in developing regional water resource planning staff.

Nonpoint Source Management Plan

Funding under Sections 205(j) and 319 of the Federal Clean Water Act supports the development of state Nonpoint Source Assessment Reports and Nonpoint Source Management Plans. One of the primary functions of the NPS plan and Assessment Report is to act as a vehicle for federal implementation funds. Massachusetts Department of Environmental Protection and the Nonpoint Source Advisory Committee are currently preparing a priority watershed list, and portions of Massachusetts Bays may be included. If some areas of the Massachusetts Bays watershed are designated as priority areas, they will be eligible to submit proposals for 319 funds. The integration of Massachusetts Bays Program goals into the NPS plan will allow federal funding for demonstration projects to control nonpoint source pollution into Massachusetts Bays Program waters. The designation is important because there are few other grant programs that specifically address nonpoint source problems.

The Massachusetts Bays Program and NPS plan share two important objectives regarding plan implementation. The first is a focus on engaging more effective local action to control nonpoint sources associated with land use. The second is a recognition of the need to improve the degree of coordination among the various management agencies at the state, regional and local levels. The NPS plan has taken some action in these areas which may prove useful to the Massachusetts Bays Program.

Section 205(j)1/604(b)

Sections 205(j)1 and 604(b) of the Federal Clean Water Act authorize a water quality management and planning grant program which has immediate applicability to the Massachusetts Bays Program for several reasons. The review of this program indicated the following areas of interest to the Massachusetts Bays Program.

- The 604(b) program has been a reliable source of federal grants for groundwater protection and will continue at least through 1994.
- The protection of groundwater quality through 604(b) can help achieve Massachusetts Bays Program objectives.
- Recent 604(b) reports represent a significant source of information that may be helpful to Massachusetts Bays Program efforts to determine the impacts of groundwater on its coastal estuaries.
- Recommendations made through the 604(b) program to protect groundwaters represent strategies that could help improve coastal water quality.
- The 604(b) program has developed comprehensive local resource protection programs that could be applicable to the Massachusetts Bays Program.
- The 604(b) program has developed some good models for regional protection strategies.

Section 303(e) Basin Planning

The 303(e) basin planning program authorized under the Federal Water Pollution Control Act Amendments of 1972 has ended, however, there are valuable lessons that can be learned. This program was very successful at bringing about implementation mainly because of the extensive implementation powers granted to the program. Because of these powers, all inland strucutral recommendations were implemented. However, coastal and CSO (combined sewer overflow) recommendations are still being studied. The major lesson to be learned from the 303(e) program is that plans can be implemented if funding and enforcement powers are applied by state and federal agencies.

Coastal Zone Management Planning

Many of the current programs of the Massachusetts Coastal Zone Management (MCZM) Office are directly applicable to the goals of the Massachusetts Bays Program and should be investigated for incorporation into the CCMP.

- All programs in the coastal region must be reviewed by MCZM for consistency with program objectives. This includes the Massachusetts Bays Program CCMP.
- MCZM staff work with the Department of Environmental Protection (DEP) relative to the siting of municipal wastewater treatment facilities that discharge to coastal waters.
- MCZM is preparing recommendations and guidelines concerning the use of marine pump-out facilities.
- MCZM directs an annual seashore area cleanup program.
- MZCM staffs the Cape Cod Marine Quality Task Force which focuses on cleaning up marine waters in order to open closed shellfish beds.
- MCZM provides technical assistance and direction in the development of Special Area Management Plans.
- MCZM oversees the coastal portion of the ACEC program.
- The recent reauthorization of the CZMA has shifted the focus of CZM further inland and has begun emphasizing land management strategies.
- MCZM oversees the Harbor Planning Program.
- MCZM has extensive information on shoreline changes.
- MCZM is invloved in the development of the Coastal Nonpoint Pollution Program Plan.
- MCZM is coordinating a coastal data management program as part of the Gulf of Maine Project.
- MCZM staff are available to assist communities in establishing Oil Spill Contingency Plans.
- MCZM includes a citizen participation component, the Coastal Resources Advisory Board.

All of these program will have direct applicability to the implementation of the Massachusetts Bays CCMP. Therefore, there will need to be close communication between these two entities.

Harbor Planning

The state Harbor Planning Program can be an important planning and implementation tool. Harbor Plans are developed locally and, therefore, are comprehensive in their scope, tying together the economy, aesthetics, and resource protection. When water quality is a primary issue, the plan must also address and inventory water quality conditions for the harbor's drainage basin.

All of this work ties directly to the scope of the CCMP. Thus, an ongoing exchange could be arranged now, establishing a good program relationship with those who have the authority to implement many of the future CCMP recommendations. Efforts should be made to ensure that state and local data collection is coordinated concerning who is collecting what, in what format, and on scales useable by both parties.

Another important aspect of this program is that Municipal Harbor Plans (MHPs) will have the "power of law" relative to their enforcement locally and by DEP. Thus, these local or inter-local plans will have more authority than the CCMP. Massachusetts Bays Program staff should be included in all scoping and plan review meetings relative to MHPs. It is highly unlikely that municipal waivers could be granted for anything that would be in conflict with the CCMP as it evolves over the next five years, but staff involvement from the outset should add some insurance.

Areas of Critical Environmental Concerm

Designation as an Area of Environmental Concern (ACEC) is overseen by the state Secretary of Environmental Affairs. A link between the Massachusetts Bays CCMP and locally adopted ACEC management plans may provide an important mechanism for the implementation of Massachusetts Bays Program goals. The ACEC designation process also promotes Massachusetts Bays Program goals by raising public awareness of local environmental concerns. Campaigns for the designation of an area as an ACEC often involve substantial local participation, a process which can develop a strong sense of community "ownership" or "stewardship" over the area and sensitizes the public about the need for "special areas" protection of coastal resources. Most importantly, the public involvement of the ACEC designation process localizes the broader coastal resource concerns embodied in the Massachusetts Bays Program goals, and creates a mechanism for local action.

Cape Cod Commission Regional Policy Plan

The Cape Cod Commission (CCC) and its regional policy plan represent an important mechanism to help implement Massachusetts Bays Program goals on Cape Cod. There is a clear connection between the objectives of the regional policy plan and the Massachusetts Bays Program. In fact, the plan in many ways provides a detailed and comprehensive strategy to implement Massachusetts Bays Program goals.

The CCC and the regional policy plan also extend coastal resource protection powers to local regulators. Furthermore, within two years, a town's land use and development bylaws must be amended to be consistent with their local plan. This ensures that all developments subject to local review, not just those that trip regional thresholds for review, will be judged according to regionally approved standards. The CCC's growing database of coastal resources and marine waters may also be valuable to the Massachusetts Bays Program.

Cape Cod Aquifer Management Project

Because the Cape Cod Aquifer Management Project (CCAMP) focused exclusively on the protection of groundwater resources, its direct applicability to the Massachusetts Bays Program is limited. However, many of the techniques proposed by CCAMP to reduce the impact of land uses on groundwater may be useful to decrease the contamination of coastal resources caused by polluted groundwater. CCAMP's methodology -- the resource-based approach -- may also have important implications for the Massachusetts Bays Program.

CCAMP broke new ground in the development of innovative, interdisciplinary arrangements among the various levels of government. Because coastal resources share a similar lack of regulatory guidance, the Massachusetts Bays Program will need to foster the same interagency cooperation from the outset.

CHAPTER 1. INTRODUCTION

A. BACKGROUND

This report is a review of water quality management and planning programs in Massachusetts as part of an overall project to improve coastal water quality under the Massachusetts Bays Program. The goals of the Massachusetts Bays Program, part of the Environmental Protection Agency's National Estuary Program, are to protect and improve water quality and enhance living resources in Massachusetts and Cape Cod Bays. The Massachusetts Bays Program includes in its approach the development of a Comprehensive Conservation and Management Plan (CCMP) that will provide a plan of action aimed at the protection and preservation of the ecological integrity of the Massachusetts Bays ecosystem. The purpose of this report is to review and assess existing coastal water quality management planning programs in the region for applicability to the development and implementation of the CCMP.

By its very nature, the management and protection of coastal resources includes a wide range of water and land use issues and involves a diversity of agencies across all levels of government. Before the Massachusetts Bays Program embarks on its coastal program, a logical first step is to assess past and current water resource planning programs. As part of its "action now" agenda to take swift and efficient action to protect and preserve coastal water quality, the Massachusetts Bays Program is interested in understanding how the wide range of existing water quality management and planning initiatives undertaken in Massachusetts may apply to the CCMP's management agenda and how the Massachusetts Bays Program may build on the extensive foundation of water resource planning already in place in Massachusetts. This report is designed to provide that review and help the Massachusetts Bays Program integrate its goals with past and current plans to ensure a better "fit" between water quality management agendas for Massachusetts Bay.

The report has two tasks:

1. Review and assess the Southeastern New England Study (SENE) and 208 Planning Program (208) to better understand how effective these programs have been and why. An important question to ask is what can the Massachusetts Bays Program learn from these past experiences--their successes and failures--in order to build on previous accomplishments and avoid repeating tactical and procedural errors.

2. Review and assess current water quality planning programs for applicability to CCMP development and implementation and to identify potential problems and opportunities. An important question to answer is how can the CCMP work with existing programs to protect and preserve water quality, maximize available resources and avoid program duplication.

B. SCOPE OF REVIEW

The report assesses a wide range of land use and water quality planning programs. Its focus is exclusively on planning programs. Analysis of federal, state and local water quality and land use regulatory programs that may affect the CCMP for Massachusetts Bays was not included in the scope of this report. In addition to the SENE study and 208 program, the report will include an analysis of:

- Nonpoint Source Planning
- Water quality management and planning in accordance with Section 205(j)1, now 604(b), of the Clean Water Act
- Basin planning in accordance with Section 303(e) of the Clean Water Act
- Coastal Zone Management Planning
- Harbor planning
- Areas of Critical Environmental Concern (ACEC)
- The Cape Cod Commission Regional Policy Plan
- The Cape Cod Aquifer Management Project (CCAMP)

C. STUDY AREA

The geographic area for this study includes all communities along the Massachusetts Bays coastline from Salisbury on the North shore, south to Provincetown on Cape Cod, and those inland communities that abut the coastal towns.

D. FOCUS OF REVIEW

The review focuses primarily on planning and the implementation of plans at the federal, state and regional levels including initiatives undertaken by the five regional planning commissions in the study area: Merrimack Valley Planning Commission (MVPC), Metropolitan Area Planning Council (MAPC), Southeastern Regional Planning and Economic Development District (SRPEDD), Old Colony Planning Council, and the Cape Cod Commission. Although the analysis emphasizes state and regional programs, local initiatives, such as harbor planning, are also reviewed where they are substantially instructive to the development of the CCMP. The analysis will emphasize what the plans propose or accomplished and their relevance to the goals and objectives of the Massachusetts Bays Program and CCMP.

CHAPTER 2. HISTORICAL WATER QUALITY PLANNING

A. SOUTHEASTERN NEW ENGLAND (SENE) STUDY

Introduction

The federal Water Resources Planning Act created multi-state regional planning agencies to perform water and related land planning activities. The agency covering Massachusetts was known as the New England River Basins Commission. This organization funded and coordinated a request from Massachusetts and Rhode Island for a study to determine ways to accommodate anticipated growth without drastic environmental changes. This four-year planning study, conducted from 1971 through the fall of 1975, had two parts: Regional Guidelines relative to guiding growth; and ten Planning Area Reports. The Planning Area Reports covered ten river basins or drainage areas and included further guidance on the regional growth guidelines, including specific structural or capital acquisition recommendations on water supply, water quality, outdoor recreation, marine management, flood and erosion control, and siting issues.

SENE Study Description

The goal of the SENE program was to identify and recommend a management program for the conservation and development of the region's water and related land resources, over a period of 20 to 50 years. The plan would accommodate conflicting demands for conservation and growth in 215 communities in Eastern Massachusetts, starting with the Ipswich Basin (does not include the Merrimack Basin) to Buzzards Bay and all of Rhode Island. The impacted basins which drain to the Massachusetts Bays Program area are:

- Ipswich - North Shore
- Boston Metro
- South Shore
- Cape Cod and Islands

The source of funding for this program was Title II of the Water Resources Planning Act. The total amount was $4.5 million, of which $725,000 originated from the Army Corps of Engineers and $1 million came from in-kind matches from Massachusetts and Rhode Island.

There were three major findings from this study:

- Enhancing the environment enhances the region's economy.
- Growth can be handled, but must be guided away from fragile resources. In order to guide, there needs to be a State Development Policy that is resource-based.
- No major changes in resource management systems are needed -- Tools already exist. Implementation can occur through existing institutions.

Region-wide findings and recommendations for the four Mass Bay regions are outlined in Appendix A in Tables A-1, A-2, A-3, and A-4.

SENE Study Evaluation

This evaluation of the SENE study looks at its success at implementing its structural and growth management recommendations as well as the citizen participation aspects of the study.

Structural Implementation

Table A-5 in Appendix A lists all the specific water quality structural recommendations for each of the four Massachusetts drainage basins covered in the SENE report that flow to the Mass Bays study area. Beside each structural recommendation, one will find either "yes," "no," or "ongoing" to indicate whether that recommendation was implemented. Since the scope of this study is water quality planning, specific structural or capital recommendations in the categories of water supply, outdoor recreation, flood and erosion control, marine management, etc., were not tracked for their implementation.

In general, many of the structural proposals were very controversial because of their scale, their cost, or the unprecedented regional cooperation necessary. For instance, it was in the SENE study that it was first proposed to divert the Connecticut River to provide water supply for the then MDC eastern Massachusetts customers.

Growth Management Implementation

The growth management recommendations in the SENE study were wide ranging. Recommendations found in the 1990 Final Report of the Special Legislative Committee on Growth and Change, including use of terms such as "sustainable development" and "clustered development", could be found in the 1975 SENE study. Implementation of these recommendations have been sporadic at best. Some communities have implemented aquifer protection bylaws, but most have not. Those which did usually had experienced a direct threat to or loss of a water supply. Some used the technique more as a means to slow growth rather than employing it to protect a water supply.

For the most part, recommendations necessitating state implementation did take place; however, some of the recommendations took nearly twenty years, e.g., adoption of an anti-degradation policy for all surface waters. A great deal of progress has been made since 1975 in the areas of wetland protection and barrier beach protection. It should be noted that, despite a SENE study finding that no new tools were needed to protect environmental resources, new state and federal tools were created, e.g., amendments to M.G.L. Chapter 91 dealing with filled tidal lands, and the federal Safe Drinking Water Act. These laws and other state and federal regulations are examples of what occurs when recommended local actions are not taken. Laws and regulations are promulgated that either shift implementation authority away from purely local control, e.g., Chapter 91, or mandate implementation such as the monitoring and remediation requirements found in the Safe Drinking Water Act.

For the most part, the implementation of the growth management recommendations which did occur took place in the 1980's and later. The implementing actions were the result of:

- State and/or federal regulations that required such action, e.g., FEMA floodplain regulations
- State and/or federal "discretionary" funding provisions that "require" certain land use provisions, e.g., DEP new source approval regulations

- Growth pressures and impacts that resulted from a rapidly-expanding economy

Whether the growth management recommendations were implemented or not, overall, they remain as valid in 1991 as they were in 1975. Their implementation is essential if the Massachusetts Bays Program goals are to be met.

Also, the SENE Study occurred during an economic recession similar to the one we are currently experiencing in Massachusetts. The SENE goals clearly articulate the authors' wish to accommodate development, as well as protect the region's resources. However, there was almost no discussion of the marine economy, its special needs and the conflicts between tourism, development and resource protection, etc. The one economic recommendation found in the study was tied to the then-controversial 200-mile coastal boundary to protect Massachusetts fishermen's access to the rich George's Bank. In order for the Massachusetts Bays Program plan to be perceived as credible, with sound recommendations, it must identify the economic as well as the environmental context of coastal planning. Regardless of how sound the resource-based recommendations may be, if the plan is labeled an "economic disaster," it is highly unlikely that significant implementation actions will occur.

Citizen Participation

Despite the attempts by SENE staff to invite citizen participation, they were largely unsuccessful in gaining local support for many of the recommendations. The study was an inter-agency cooperative effort similar to the Massachusetts Bays Program. It included both policy and technical staff from the following groups, in addition to the staff of the New England River Basins Commission:

FEDERAL-STATE

New England River Basins Commission
New England Regional Commission

STATE

Massachusetts
- Department of Natural Resources
- Water Resources Commission
- Division of Water Resources
- Department of Community Affairs

Rhode Island
- Statewide Planning Program

FEDERAL

Department of Agriculture
- Soil Conservation Service
- Economic Research Service

Forest Service
Department of Commerce
- National Weather Service

National Marine Fisheries Service
Maritime Administration
Bureau of Economic Analysis
Department of Defense
Department of the Army
Corps of Engineers
Department of Housing and Urban Development
Department of the Interior
Bureau of Mines
Bureau of Outdoor Recreation
Fish and Wildlife Service
National Park Service
U.S. Geological Survey
Department of Transportation
Federal Highway Administration
U.S. Coast Guard
Environmental Protection Agency
Water Quality Branch
Water Supply Branch
Federal Power Commission

REGIONAL PLANNING AGENCIES

Merrimack Valley Planning Commission
Metropolitan Area Planning Council
Old Colony Planning Council
Cape Cod Planning and Economic Development Commission
Dukes County Planning and Development Commission
Nantucket Planning and Economic Development Commission
Central Massachusetts Regional Planning Commission
Southeastern Regional Planning and Economic Development District
Southeastern Connecticut Regional Planning Agency

In addition to this inter-agency configuration, there was also both a Citizens Advisory Committee (CAC) and a Regional Scientific Task Force. It should be noted that, after one year, these two groups joined together to become a single advisory committee. Among the CAC members were representatives from each of the ten planning areas and from the fields of business, conservation, industry, real estate, and education. This CAC was intended to have a regional (multi-state) perspective; therefore, in order to gain more local insight, ten basin advisory committees (BACs) were also formed. Members of the BAC included local officials, such as planning board and conservation commission representatives, and private organizations, such as watershed associations, builders' associations, and the League of Women Voters. Questionnaires were distributed and tabulated as yet another technique to reach out to the public to learn their perception of the problems and potential solutions.

Summary

Despite the efforts cited above, many of the structural and growth management recommendations were rejected outright or are still being studied today, e.g., provision of secondary treatment for the

communities in the South Essex Sewer District. Since the public outreach efforts underway for the Massachusetts Bays Program mirror those employed 20 years ago in the SENE study, more follow-up work should be done to speak to the individuals (names available) who served on the CAC and BACs to gain their perspective as to why local "buy-in" did not occur in the SENE program.

Some of the reasons cited for the lack of local buy-in and implementation provided by the public officials interviewed for this review study included:

- There was a lack of follow-up implementation funding, especially for the growth management portions.
- Communities lacked staffing and expertise to implement the recommendations.
- There was no sense of "urgency" to expend time and money on these issues versus other more imminent expenses.
- The problems identified were either general or someone else's, especially Greater Boston. No one would allow their water that might be needed in the future to be used by other communities now.
- There was not enough (or accurate) scientific and engineering documentation to justify the broad-sweeping recommendations made.
- Land use recommendations were too controversial for local officials to want to spearhead their passage.
- There was no clear articulation of who should do what next to implement the recommendations.
- There was no direct link between the SENE plan and future implementation, e.g., no public funds for a treatment plant unless it was recommended in the plan.
- This study was supposed to focus on economic opportunities, as well as resource protection. Yet there is no section on economic development. "This is a no- growth, anti-economy study" was an often-heard criticism.

In fairness to the New England River Basins Commission staff, the SENE study conducted a state-of-the-art (for 1975) public outreach effort. Therefore, SENE's citizen participation problems, number of recommendations, and cost and controversy may not have been the major reasons for slow acceptance of its proposals. It should be noted that the River Basins Commission ceased to exist shortly after the SENE study was released. Therefore, there was no organization to champion the cause of the SENE work. The two states which had represented the study had also experienced major personnel changes soon after SENE due to gubernatorial elections. Thus, there was no institutional ownership to push for implementation.

Among the first questions we received when we asked about the SENE study were: "What is that?" or "Why do you want to look at that old thing? It never amounted to anything!" In fact, the list of implementation actions, included in the appendix of this document, shows that many recommendations, both structural and growth management in nature, were followed. It is unclear whether these actions were a direct result of the SENE study or of others, but it is clear that the SENE study is not currently credited with their success. In general, the SENE study is unknown, or is thought by senior officials who recalled the document, to be too broad and meaningless. None of those interviewed believed that implementation occurred because the SENE plan initiated or required it. Later funding decisions appear not to have been based on the four-year planning study that preceded them.

The Massachusetts Bays Program, which shares many of the same goals as the SENE program and has

similar management and citizen participation structure, must be careful to avoid sharing the same outcome after its five years of work. Clear statements as to who should be doing what, and when, and why must be made. All pollution problems and their proposed solutions must be localized in order to achieve local buy-in. There needs to be ongoing and follow-up implementation funding not only to complete the work, but to provide direct one-on-one community assistance to help local officials formulate and sell local solutions to town meetings and city councils. Also, once a bylaw, regulation or other implementation measure is in place, there must be local (or regional) capacity to administer it.

The Massachusetts Bays Program's Comprehensive Conservation and Management Plan (CCMP) will need some form of validation if it is to be taken seriously by local government. For example, if plan recommendations were to be binding once adopted, then actions contrary to the plan could not occur. Another means of validation would be to tie incentive grants to the plan. A community taking steps to implement the CCMP, would be awarded bonus funds for doing so. This is far more constructive than the "club" approach: "unless you implement the plan, you will lose existing discretionary funding." This negative approach usually causes open opposition and results in communities avoiding the validity of the policies and recommendations articulated, because they focus on and oppose the recommended implementation procedures.

SENE Footnote

The scope of this review study called for an analysis of the 1975 SENE Study for its applicability to ongoing Massachusetts Bays Program efforts. In so doing, another SENE citation was found that has more significance to Massachusetts Bays Program implementation efforts than the 1975 study. In 1969, U.S. Congress provided the Army Corps of Engineers with a SENE authorization to investigate coastal flood protection and navigation interests of the southeastern New England area defined as the area between the Merrimack River and Long Island Sound. This Resolution of Congress is still open and provides a potential funding source for Massachusetts Bays Program recommendations.

The method by which these funds are accessed entails writing a letter to the head of the Northeast Office of the Army Corps of Engineers defining a problem with the development of a water resource. Corps funding can then be made available for a federal reconnaissance study to determine the full scope of the problem and whether an economically-feasible solution exists. This study usually is 100% federally funded and conducted by Corps personnel. Upon completion of the study, a determination needs to be made that "there exists a federal interest in solving the identified problem," i.e., remedy improves commercial navigation. Assuming such a determination is made, then the Corps can proceed to perform the necessary work. The federal share of the implementation costs is 75%, unless it is a deep draft navigation project, and then the federal share can be as high as 80%.

B. 208 PROGRAM INITIATIVE

Introduction

As part of the 208 program during the 1970's and early 1980's, regional planning agencies throughout Massachusetts developed areawide water quality management plans for each town in their jurisdiction and for their region as a whole. The management plans included recommendations designed to protect and improve water quality through: the implementation of various structural and institutional measures, including the construction of wastewater treatment plants; amendments to zoning, subdivision, health and wetlands protection regulations; land acquisition and extension of sewer service.

208 Program Description

The Clean Water Act passed by Congress in 1972 established several goals for the cleanup of the nation's waters. Among the goals were the elimination of pollution discharge into navigable water by 1985 and, wherever attainable, fishable, swimmable waters by 1983. To achieve these goals, the Clean Water Act funded several programs, including the National Pollution Discharge Elimination System (NPDES) and the 208 program which established areawide water quality planning programs across the nation.

Congress broadly defined the parameters of water quality planning under the 208 program. Each regional planning agency worked under federal 208 guidelines which included:

- 208 plans must address point sources and non-point sources of water pollution
- 208 plans must focus on prevention of pollution as well as pollution remediation
- 208 plans must be areawide and address issues and problems that cross municipal boundaries
- The process of developing 208 plans must include citizen participation
- 208 plans must identify the means of their implementation and develop an areawide management system to implement the plans through 1995

208 plans for the Mass Bays area provided for water quality management planning by:

- Assessing Needs: the characterization of water resources in each region and town
- Identifying Problems: the identification of existing and potential sources of water pollution in each region and town
- Scheduling Actions: the presentation of recommendations for the purpose of correcting and preventing water pollution problems
- Assessing Implications of Actions: An assessment of the impacts of proposed actions
- Coordinating Planning and Management: an analysis of the management implications for local, regional, state, and federal governments responsible for plan implementation

Water quality management plans included a delineation of the relative priority of actions recommended toward the prevention and control of water pollution problems. These priorities reflect coordination of 208 planning programs and related plans such as water supply, solid waste, air quality, and coastal zone management.

Funding for the 208 program began in 1972. Initial grants were received in Massachusetts in 1975 and

planning began soon after. Although funding for 208 plan development stopped in 1979, limited follow-up funds awarded competitively through the Department of Environmental Protection (DEP), were made available to Regional Planning Agencies for 208 plan implementation. Follow-up funding ended in 1983.

The Clean Water Act assigned the responsibility of cleaning and restoring the nation's waters to the states. In Massachusetts, 208 planning was assigned to Regional Planning Agencies. All RPAs in the Massachusetts Bays Region received funds for 208 planning. These include:

Merrimack Valley Planning Commission (MVPC)
Metropolitan Area Planning Council (MAPC)
Cape Cod Planning and Economic Development Commission (CCPEDC)
Southeastern Regional Planning and Economic Development District (SRPEDD)
Old Colony Planning Council (OCPC)

An evaluation of three of the 208 planning initiatives conducted by RPAs in the Massachusetts Bays watershed are included at the end of this section. These include:

1. MVPC
2. MAPC
3. CCPEDC

208 Program Evaluation

Interviews conducted during the research on the 208 Water Quality Planning Program revealed a common general criticism from those involved with the program, a theme echoed throughout the Massachusetts Bays Program region. The 208 program produced good plans, stimulated important thinking, provided momentum for future work in water quality planning and initiated new programs, but did not accomplish enough tangible results to be remembered primarily for its implementation success.

One conspicuous measure of the implementation success of the 208 program is the degree to which the structural solutions proposed in the different regions were built. According to information gathered in interviews with the staffs of RPAs and the Division of Water Pollution Control (DWPC), 18 of the 22 proposed treatment facility expansions or constructions were completed or are currently ongoing.

The usefulness of this measure of 208 accomplishments must be qualified. Many of the structural solutions proposed by 208 plans were made in support of ongoing wastewater treatment facilities planning including 201 facilities planning projects. In these circumstances, implementation of the facilities plans cannot be credited to the 208 plan alone. In fact, even those facilities for which a 208 plan can claim primary credit, the actual construction of the facility still required much more in-depth planning and engineering design than provided by the 208 plan. This is not unexpected, as the purpose of the two types of planning programs is substantially different. 208 plans were area-wide and comprehensive, looking at a wide range of water quality problems and alternative improvements, both structural and non-structural, as well as the cost-effectiveness of various actions. 201 facility plans were part of the engineering solution to an identified point of pollution. 201 facility plans were generally carried out pursuant to court or regulatory sanctions and benefited from substantial federal and state grants that often totaled 90% of costs.

The sewerage construction grants program, which is now virtually gone, was, at that time, at its peak. 208 comprehensive water quality planning was viewed by some as a threat to the systematic construction of sewerage treatment plants. Indeed, that was sometimes the case, as some 208 plans recommended against certain sewerage facilities because of limited water quality benefit. It was not until 208 planning was nearly completed that the U.S. Office of Management and Budget issued findings that nonpoint sources of water pollution were the field of improvement where the most cost-effective investments and benefits could be realized (excluding specific areas where fundamental sewerage improvements were still necessary, such as Greater Boston).

Analysis of the implementation of non-structural recommendations made by 208 plans is hard to quantify. One reason is the difficulty in measuring the consequences of a "path not followed"; that is, of environmental problems avoided. Another reason is that, unlike the point source construction program where there was an "implementation schedule" and grants, there was no fiscal or regulatory "schedule" for non-structural recommendations. Yet another reason is that the changes in land management policy recommended to state and local governments to prevent and control water pollution problems were a bit ahead of their time and became part of a long term evolution in land management programs. While many of the recommendations--e.g., the adoption of aquifer protection bylaws or health regulations controlling the installation of underground storage tanks at the local level--have been adopted in many communities, overall implementation of non-structural recommendations has been generally slow, but steady. Those communities that did implement 208 land management recommendations were often motivated by many factors. Threats to water supplies, rapid community growth, and compliance with state regulations were often the prime impetus behind the flurry of local planning and regulatory activity--so called "growth management" planning--in the mid 1980s.

Members of the Massachusetts Bays Program region RPAs involved in 208 development and implementation identified reasons for the shortcomings and benefits of the 208 recommendations. The following provides a summary of these issues, six shortcomings followed by seven benefits.

SHORTCOMINGS OF THE 208 PROGRAM

Limited Federal and State Commitment and Follow-Through

There was general agreement that the primary shortcoming of the 208 program was the lack of funding for and real commitment to the implementation of 208 plan recommendations. Follow- up funds were available to RPAs from EPA and were earmarked for plan implementation. However, these grants were limited in amount and were generally considered insufficient to fulfill the goals of the plans. Unlike the main round of 208 funding, these grants were awarded competitively, further dividing the total amount and limiting the number of grant recipients. All 208 funding ended in 1983; that cut-off is considered the primary reason that the 208 program did not accomplish better results.

There is evidence that continued funding could have improved the implementation record. First, on Cape Cod, the relative success of the CCPEDC 208 was attributed to the receipt of three years of follow-up funds for plan implementation. From 1980 to 1983, staff members funded by 208 engaged in an extensive program of public outreach and technical assistance which included an estimated 300 public meetings and seminars with local officials. These meetings focused primarily on the importance of building public support for the protection of the region's groundwater supply and the abatement and prevention of non-point sources of contamination through comprehensive land management practices. The CCPEDC staff planner responsible for 208 implementation estimated that 80% of the local land

management recommendations were adopted by local governments. The outreach efforts are also credited with raising public awareness of groundwater issues on the Cape and increasing public support for environmental and water resource protection. The generally high level of support made the implementation of expensive local programs--such as septic system maintenance programs or the construction of marine pump-out facilities--easier to achieve on the Cape. The lack of comparable environmental awareness in the other regions in the Massachusetts Bays Program area limited the effectiveness of the 208 plans.

It should be noted that while the success of 208 plan implementation on the Cape can be attributed to the follow-up funds, several factors unique to the Cape distinguish this region from others in the Massachusetts Bays Program area. Follow-up funding is not the only reason for the Cape's success. Other factors include:

- The Cape's geology and reliance on groundwater as the sole source of drinking water--a feature that tends to solidify public support for water protection planning and regulation
- A high level of public awareness of and concern for environmental issues and an active and influential environmental movement spearheaded by the Association for the Preservation of Cape Cod
- A sense of place and character that give the Cape a powerful sense of regional identity

These and other factors present on the Cape--factors that are not present to such a high degree in other coastal regions of the state--created a favorable environment for the successful implementation of the 208 recommendations.

Secondly, as previously mentioned, the implementation of 208 structural solutions was to a large degree the work of the 201 facilities planning and construction grants program. The 201 program refined 208 wastewater treatment recommendations and provided funds that made construction possible. The non-structural recommendations of 208 had no such similar complementary program with a long-term commitment to plan implementation. Indeed, the call by some 208 plans for flexible priorities and cost-effective funding, and for 90% grants for nonpoint source matters and non-structural solutions, was not carried out at the higher levels. New administrations in Washington wanted to eliminate the grants program, and were subsequently successful.

Local Funding Constraints

Another reason for the limited success of 208 implementation cited by RPA planners was the inability of local governments to fund even modest water quality improvement programs due to the constraints of Proposition 2 1/2. Recognizing that land use planning and regulatory tools--such as zoning and health bylaws--are controlled by local governments, and that prevention and abatement of water quality problems, especially non-point contamination problems, would require amendments to local development bylaws, the 208 plans directed much of the responsibility to improve water quality to towns. However, in the absence of federal or state funding, the constraints of Proposition 2 1/2 limited the ability of local governments to undertake aggressive water quality initiatives. In addition, those towns that were able to incorporate water quality regulations into local bylaws found that implementation and enforcement was difficult. Many towns lacked the funds to hire professional staffs necessary to administer the new programs. Federal and state financial assistance was not available for management and enforcement.

Limited Local Follow-Through

The 208 program was to some degree dependent on local implementation of recommendations in order to achieve its goals. This dependence placed the program not only at the mercy of local fiscal constraints but also the ability of each plan to engage local support. To build local support, each plan included a citizen participation element which typically included the involvement of advisory committees: an Areawide Planning Advisory Committee (APAC) made up of members of the public, representatives of federal, state, and local governments and members of environmental interest groups; a Technical Advisory Committee (TAC); and a Citizens Advisory Committee (CAC) composed of citizens and interest groups. These committees provided overall policy input, technical advice, and commentary on preliminary reports. In addition, 208 planning staffs conducted a wide range of public outreach activities including:

- Public meetings
- Workshops and seminars
- Publication and distribution of reports
- Public exhibits and presentations
- Assistance to advisory committees

Despite the efforts of 208 planning staffs to engage political support, including obtaining local government endorsements both before and after plan development, those interviewed generally agreed that the citizen participation work did not ensure local implementation. The level of support varied across the study area. In those areas such as the Cape, where the threat to water supplies was obvious and severe, 208 recommendations experienced a higher rate of implementation. In other areas where overall resistance to the 208 process was higher and environmental awareness was lower, implementation of the 208 recommendations was less successful. More research needs to be undertaken to determine the reasons why certain citizen participation initiatives were more successful than others. It is clear that many factors in addition to the formal citizen participation program affected the level of acceptance of the 208 plans. These factors must also be considered when designing Massachusetts Bays Program public outreach efforts.

Widely-Ranging Recommendations

Another criticism of the 208 plans was that recommendations for structural and non-structural water quality improvements were not always easy to implement. Those interviewed observed that, in the attempt to be thorough and comprehensive, the 208 plans often bit off more than the implementing agencies could chew. The recommended plans were often so broad and far-reaching that they were beyond the realistic capabilities of the agencies involved. Major changes--such as statutory recommendations and broad-based proposals for interagency cooperation--may have been the most effective and visionary solutions. However, because of the difficult nature of their implementation, they may have engendered resistance. Controversial recommendations were often rejected outright or were forgotten after years of agency inactivity.

Interviewees observed that, in a planning effort as comprehensive as a 208 project, there is a fine line between developing a clear action plan and delineation of agency responsibilities and going beyond the capability or receptivity of the implementing parties. They pointed out that the need to develop a long-term, comprehensive plan must be balanced with the need to set achievable objectives and make practical recommendations that will lead to tangible results. This is the dilemma and challenge to any

comprehensive plan.

Lack of Support for Non-Structural Programs

Interviewees also observed that implementation of 208 plans could have been more successful if the EPA had incorporated 208 recommendations into their policy-making and funding decisions in a more systematic manner. While it was acknowledged that 208 plans were considered in EPA decisions to fund large construction projects such as 201 wastewater treatment facilities grants, key aspects of 208 plans, including groundwater protection and nonpoint source reduction, were left to state and local government for implementation. One issue cited was that EPA could have provided policy direction for nonstructural solution options. Federally-promulgated guidelines and best management practices for the control of nonpoint sources and protection of groundwater would have improved the success of local 208 implementation efforts. It is only recently, approximately ten years after the end of the 208 programs, that EPA has developed programs to address groundwater and non-point source pollution problems.

It was also suggested that EPA should have been more flexible in its criteria for grant eligibility. Several of the 208 plans recommended low-level, cost-effective pollution abatement solutions that were less expensive but more effective than grant-eligible construction actions. Comprehensive wastewater treatment alternatives that included combinations of low-cost actions such as stormwater runoff control, septic system management, and other methods that were less expensive than the construction of more traditional wastewater treatment facilities, were not afforded the same funding priority. This policy created an incentive to develop sewage construction plans through the 201 program and, by default, to de-emphasize the 208 plans.

Duplication

Another criticism of the 208 program is that the guidelines for plan development required too much duplication of effort from the various RPAs. In the writing of 208 recommendations, especially for non-structural recommendations directed toward local governments, each RPA wrote model bylaws and fact sheets to promote plan implementation. It was pointed out that some RPAs could have been encouraged to work together to share tasks and projects which could be utilized generically across the state. However, it should also be kept in mind that, at the time, there were few models for nonpoint source issues. Moreover, local government is far more likely to adopt a locally-generated bylaw than one developed at the state or federal level.

BENEFITS OF THE 208 PROGRAM

Despite the criticism, planners at the RPAs and other interviewees considered the 208 program beneficial to water resource planning efforts for several reasons. There are a number of progressive features contained in the 208 plans beyond their specific recommendations and achievements. Some of these positive attributes simultaneously reflect shortcomings described above. Nonetheless, 208 plans clearly advanced the science of environmental management.

Comprehensive Approach

The comprehensive approach of the 208 program, with regard to both water pollution sources and management options, was an important step in the field of water quality management. A wide variety of water quality issues were addressed, their relative importance quantified, and management actions, both

short-term and long-term, integrated into one document. These subjects included:

- Municipal and Industrial Sewage
- Advanced Sewage Treatment
- Septage Management
- Sludge and Waste Disposal, Toxic Materials, and Superfund Issues
- Groundwater Supply Protection
- Urban Runoff
- Agricultural and Silvicultural Runoff
- Combined Sewers and Infiltration/Inflow
- Nonpoint Sources of Water Pollution
- Lake Management
- Critical Environmental Area Management
- Non-Review Issues
- Water Quality Standards
- Non-Construction Water Quality Management Techniques

In most areas, 208 plans provided the first comprehensive strategy for water quality management.

Growth and Development Process

The 208 programs also advanced environmental management by looking at water quality, not as a discrete problem, but as part of the growth and development process. Impacts on natural resources result from the complex process of society and its economy meeting the needs and demands of the people. The economic development process, with all its rough edges and jostling interests, provides the wherewithal for society to fulfill its obligations. These demands may be defined in terms of changes in population and households, income, employment, and land use. Information on these characteristics lays the basis for better definition of needs, problems, and alternative solutions.

The 208 program evaluated the growth and development process by systematically analyzing, and often projecting, demographic, economic, and land use trends on the basis of a regional economy. By taking this approach, 208 plans also better anticipated the economic and political realities that are a necessary part of the implementation of the environmental agenda. Indeed, they are a prerequisite to that agenda because a poorly-performing economy has less ability to afford needed environmental improvements.

Another benefit of this 208 approach was to balance off the largely "end-of-pipe" problem-solving that had previously, and necessarily, occurred. If the environmental agenda is to prefer "pollution prevention" over "pollution correction," then it must reckon with the development agenda. Otherwise, it will always be reactive rather than proactive, inefficiently trying to catch up with a problem.

Anticipated Future Priorities and Programs

One of the most noteworthy accomplishments of the 208 program was in anticipating and initiating future water quality priorities and/or programs.

- **Nonpoint Source Pollution Control.** The 208 program, in most areas, was able to quantify the importance of nonpoint source water pollution. In many areas, nonpoint sources have held back the gains anticipated from sewerage treatment plant construction.

Over the 15 years since the 208 program, nonpoint source water pollution control has received increasing attention and priority from EPA and the environmental community.

- **Septic System and Septage Management.** Most areas are not sewered and, therefore, rely on sub-surface disposal of wastewater. Most 208 plans had strong septic system management components ranging from education to regional septage disposal agreements. Septic system design, regulation, and inspection have received increasing attention from the state and local governments over the past 15 years.

- **Non-Riverine Water Quality Programs.** The 208 program brought attention to non-riverine water quality issues. Prior to that, the construction grants program and the National Pollutant Discharge Elimination System (NPDES) had focused efforts almost exclusively on main stem rivers. The latter was necessary in many cases, especially at the start of the cleanup programs. But the 208 program highlighted the irony that the water resources most heavily and directly used by most people were receiving little attention, e.g., lakes, small streams, aquifers. Many 208 plans initiated programs for those resources.

- **Groundwater Protection.** The 208 program systematically addressed the quality of drinking water supplies and pollution threats thereto. After the closing of numerous contaminated groundwater supplies, there are new state and federal programs designed to help protect groundwater quality, especially near wellheads. Many local governments, as well, have adopted regulations to protect groundwater sources.

- **Waste and Toxics.** The 208 program identified existing and closed waste disposal sites, as well as areas with concentrations of toxic material. Leachates from these disposal areas threatened groundwater and surface water and the public health in general. The 208 effort in this regard supported the development of the "superfund" program.

- **Critical Area Standards.** Many 208 plans identified critical environmental areas important to water quality improvement. Standards for the use and/or protection of these areas were developed, often for the first time, in 208 plans. These areas included aquifers, major wetlands, lakes, stream and pond buffers, and water conservancy areas. The state has since established a formal ACEC program.

Institutional Follow-up

At the institutional level, the 208 program has been credited as a springboard for further water resources planning at the regional and local levels. Many of the issues raised during 208 studies have been the subject of follow-up planning under:

- 208 follow-up program
- 201 facilities planning
- 205(j)1 and later 604(b)
- 205(j)5 and 319

Much of the work done through 205(j)1/604(b) in the 1980's regarding groundwater protection builds on data analysis and technical knowledge developed during 208. Most recently, the Massachusetts Non Point

Source Management plan (1989) emphasized water quality planning and management based on efforts of 208 plans.

The continued relevance of 208 planning issues and recommendations is well illustrated on Cape Cod where the CCPEDC 208 and follow-up plans are credited as the seminal work that launched one of the most progressive and comprehensive regional approaches to water quality management. Planning efforts subsequent to 208 which build on its recommendations include: the delineation of Cape-wide zone II zones of contribution to public water supply wells in 1983, the Cape Cod Sole-Source Aquifer designation in 1986, and the Cape Cod Aquifer Management Project in 1988. The culmination of the Cape water quality planning work can now be found in the Cape Cod Commission Regional Policy Plan, a plan which combines a comprehensive, resource-based planning approach with powerful new implementation authority.

Flexible Priorities and Standards

The comprehensive nature of the 208 program also brought forth the importance of more flexible priorities, programs, and standards. Some plans found that federal and state grant program priorities, in many instances, tend to reward the attainment of abstract standards for certain pollutants instead of the most cost-effective solutions with real benefits. This is true essentially because the heaviest construction programs received the highest priorities for federal and state grants, and the lightest construction programs frequently received no federal and state grants. Such an approach attacked some problems that have little practical significance in terms of improving the usability of water resources, and overlooked other needed water quality improvements. Thus, 208 programs identified the need for greater flexibility in the use of state and federal water quality grants. It was recommended, wherever a more cost-effective alternative program that achieved comparable benefits could be demonstrated, the federal government make all components grant-eligible. 208 plans found that non-structural and nonpoint source measures should be made eligible for grants.

If all water quality management were approached by the federal and state governments in a similarly comprehensive fashion, alternative corrective strategies would be able to compete with one another on the basis of true cost effectiveness, on the relative severity of water quality problems, and on the relative importance of various bodies of water. Indeed, this approach is now rapidly evolving at the federal level in another mode now termed "risk assessment."

Locally-Based Actions

The 208 plans presaged the growing role of local government in environmental and water quality management. The plans were developed from the local perspective; by regional planning agencies as opposed to state or federal impositions. Local endorsements of the 208 plans were required by the state before their preparation, and local approvals required upon completion!

Since that time, federal and state construction grants programs have greatly declined, while the importance of preventive planning through the growth and development process, still largely under local control, has become more evident and vital to environmental concerns. Increasingly, environmental programs are pursued by "thinking globally, acting locally," be it through local bylaws or neighborhood and citizen involvement. Building general public support and political consensus will become more and more important for environmental issues. And, this will mean taking into account all perspectives.

Building Regional Capacity

The 208 program ushered in an important new era of water resources planning and management and established an institutional mechanism to respond to water quality problems centered at the regional level. As a result of the federal funding and direction, RPAs were able to employ full-time, qualified environmental analysts. These professional staffs carried out what was usually the first thorough inventory and analysis of water resources and water quality problems in each region and developed each region's first comprehensive water quality management plan. In all three regions surveyed, RPA staff members indicated that the 208 program was the primary impetus behind the creation of their regional water resource planning staffs and helped establish the efficacy of the regional approach to water resources planning. In some areas, advocacy groups, such as watershed councils or environmental coalitions, were also either established or augmented in their endeavors.

Carrying out the 208 program demonstrated that locally-based regional commissions could effectuate a challenging environmental agenda. Those achievements contributed significantly to the success of the Martha's Vineyard Commission and the establishment of the Cape Cod Commission.

Evaluation of Sample 208 Planning Initiatives

Merrimack Valley Planning Commission

The Merrimack Valley Planning Commission 208 study was conducted from 1977 to 1979 and was funded at approximately $100,000. This study included the following Massachusetts Bays Program area towns:

Amesbury	Georgetown
Newbury	Newburyport
Rowley	Salisbury
West Newbury	

The overall objective of the MVPC Final Water Quality Status Report was to provide a water quality management plan for the Merrimack Valley region. To accomplish that goal, the MVPC plan identified the region's water quality problems and recommended a management program to address problems and improve and preserve regional water quality. The plan was designed to provide a base of information and analysis from which sound water quality management decisions could be made.

The MVPC 208 study set forth recommendations for the improvement of water quality to be carried out by federal, state and local government agencies. For each level and agency, recommendations were categorized by water pollution problem or activity which could potentially affect water quality; 16 issue areas were identified.

Regional Water Pollution Priorities

HIGH	Industrial Wastewater Treatment Needs
	Landfills
	Residuals (septage, sludge) Management

	Stormwater Runoff and Combined Sewer Overflow (CSO) Management
	Groundwater Management
MEDIUM	Septic System Management
	Sand and Gravel Operations
	Erosion and Sedimentation
	Salt Contamination
	Hydrographic Modifications
	Lakes and Ponds Management
	Recreational Use/Multiple Use
LOW	Municipal Wastewater Treatment
	Agriculture
	Silviculture
	Saltwater Intrusion

Due to limited staff and funding, the MVPC 208 plan did not provide a complete analysis of all 16 pollution issue areas. Recommendations for improvement of water quality were made for the issues in which detailed analysis of problems and discussion of solution options were completed. In an effort to optimize its resources and to direct pollution abatement efforts to the problems that posed the most serious threats, the 208 prioritized its list of 16 pollution sources. It suggested that pollution sources listed in the high priority be addressed first. Recommendations resulting from the MVPC 208 planning study are included in Appendix B.

The MVPC received one 208 follow-up grant in the early 1980's for plan implementation. With these limited funds, MVPC staff members developed a four-town, intermunicipal septage management agreement to deter illegal hauling and disposal of septic system septage.

Several towns along the Merrimack River, which did not have sewage or septage treatment facilities, had no legal sites for disposal of septage. In violation of state law, there was no record of how and where the septage in those towns was disposed. Under the initiative of the MVPC, these towns entered into an agreement with the cities of Lawrence and Haverhill to dispose of the septage in those cities' wastewater treatment plants. The agreement resolved the problem of illegal disposal and established a program to regulate septage haulers and track the disposal of septage.

Another product of the MVPC 208 follow-up grant was a septic system owners manual that described the proper use and maintenance of private, on-site septic systems. The 13 page booklet developed by planners at MVPC, contained a discussion and illustrations of the component parts of septic systems, the major problems for their failure and measures that the homeowner can take to correct or prevent septic system problems. The booklet was widely distributed across the MVPC region and was used as a prototype for other public education and outreach efforts across the state.

Metropolitan Area Planning Council

The Metropolitan Area Planning Council 208 study was conducted from 1975 to 1978 and was funded at $2.3 million. This study included the following Massachusetts Bays Program area towns:

Ipswich	Marblehead	Somerville
Hamilton	Swampscott	Quincy
Essex	Lynn	Hull
Topsfield	Nahant	Braintree
Gloucester	Saugus	Hingham
Rockport	Revere	Cohasset
Manchester	Malden	Scituate
Beverly	Winthrop	Duxbury
Wenham	Everett	Norwell
Danvers	Chelsea	Randolph
Salem	Boston	Milton
Peabody	Cambridge	Marshfield
Lynnfield	Weymouth	

The MAPC 208 plan identified the Clean Water Act's national objectives as its primary goals. However, it went on to express other goals, specific to the region, as well. These included:

- To help towns join together in the planning process to develop and implement a plan which will result in a coordinated waste treatment management system for the entire region
- To integrate wastewater treatment planning with a development plan for the region

The MAPC 208 report covers 92 communities in the metropolitan Boston region and a population of approximately 3 million people. The area includes densely-developed cities and rural communities and supports a wide range of land uses. As a result of the high density of land use in the area, the report identified a wide range of water quality problems from point and non-point sources.

In order to respond to these problems, the report set forth comprehensive recommendations for management agencies at the local, state and federal levels. The plan included general recommendations for water quality planning policy and specific recommendations to address immediate and pressing water pollution problems. These recommendations are summarized in Appendix B.

Cape Cod Planning and Economic Development Commission

The Cape Cod Planning and Economic Development Commission completed its 208 study in September 1978. The Massachusetts Bays Program study area towns involved in this study include the following:

Barnstable	Sandwich	Provincetown
Bourne	Yarmouth	Dennis
Chatham	Orleans	Harwich
Brewster	Eastham	Truro
Falmouth	Wellfleet	Mashpee

The CCPEDC's goal was to examine and analyze the Cape's water quality and wastewater management problems and develop a comprehensive and integrated approach to improve water quality and wastewater disposal. The report also cited the CWA's national goals.

The CCPEDC 208 report included a very detailed inventory and analysis of the Cape's groundwater--the

region's sole source of drinking water. It directed extensive recommendations toward federal, state, regional, and local government agencies aimed at protecting and improving water quality. The primary focus was on non-point sources of pollution which were seen as the greatest threat to existing and potential public water supply wells and the groundwater resource as a whole. Recognizing that the control of non-point sources would be best accomplished through improved development bylaws at the local level, the bulk of recommendations were directed toward the Cape's 15 towns. In addition to calling for increased local action, the 208 report emphasized the importance of building intermunicipal and regional strategies to more effectively protect the region's shared water resources.

Recommendations were divided into six categories:

- Wastewater management
- Land use controls
- Water supply management
- Non-point source controls
- Water conservation
- Management agencies

The CCPEDC 208 study plan recommendations are summarized in Appendix B.

Because of the Cape's geology and the nature of pollution threats to groundwater resources, the CCPEDC had a clear focus on groundwater protection. Driven by concern about regional water quality, and the lack of planning and regulatory muscle to protect their resources, the CCPEDC 208 developed an innovative and comprehensive program to improve the management of groundwater. It established one of the first protection programs based on the delineation of recharge areas to wells and analysis of land use impacts on groundwater supplies, concepts which during the late 1970s were ahead of their time -- many of the Cape's delineation and protection concepts are now pursued by EPAs Wellhead Protection Program. It is clear that the CCPEDC 208 contributed significantly to the general body of knowledge in hydrogeology and groundwater protection.

The Cape 208 also had a high level of success in the implementation of water protection recommendations. The primary reason for this was that CCPEDC received three years of follow-up funds from the 208 program to pursue plan implementation. As a result of this extra funding, the plan was successful in generating public support; local measures for groundwater protection were adopted more quickly and more easily than in other Massachusetts Bays Program regions.

In addition to increasing regional public awareness, the Cape 208 also spawned several private and public bodies that still influence water quality planning and decision making. The Water Resources Advisory Committee was begun as a private regional committee to work with the CCPEDC planning staff. It has evolved into an effective committee which influenced water quality planning and the development of regional protection efforts on the Cape since its inception. Another 208 era board is the Barnstable County Water Quality Laboratory which, for the past several years, has administered a region-wide groundwater monitoring program through the County Board of Health and now works closely with the Cape Cod Commission.

CHAPTER 3. CURRENT WATER QUALITY PLANNING PROGRAMS

A. NONPOINT SOURCE MANAGEMENT PLAN

Introduction

Federal funding to support activities related to nonpoint source pollution control include Sections 205(j)5 and 319 of the Federal Clean Water Act. Section 205(j)5 provided a set-aside of up to 1% of each state's construction grants allotment under Section 201. (Section 205(j)5 funds are no longer available because the construction grants program has ended). The funds were to be used: 1) to develop a state's Nonpoint Source Assessment Report and Nonpoint Source Management Plan--two elements of a state's nonpoint source program required by the Water Quality Act--and; 2) to implement the state's Nonpoint Source Management Plan.

The Massachusetts Nonpoint Source Management Plan proposes "an orderly and progressive approach to prevent continued degradation of Massachusetts surface and groundwaters where impacts from nonpoint sources have been observed." The plan is designed to be part of a comprehensive strategy intended to protect drinking water, fish and shellfish, wildlife habitat, recreation areas, open space and shoreline features. The scale of the plan is state-wide. However, following a congressional mandate in the Coastal Zone Management Act reauthorization of 1990, the state must also develop a separate management plan that will specifically address the impact of nonpoint sources on coastal resources and marine water quality. This section will address both these plans.

Plan Description

The state-wide Nonpoint Source Management Plan (referred to here as NPS plan) was developed by the Massachusetts DEP, Division of Water Pollution Control (DWPC) and was published in 1989. The NPS plan identified four objectives:

- Develop a framework for a state-wide nonpoint source control program and coordinate existing management agencies to restore and protect water quality and the biological health of the state's waters. The plan focuses on implementation including land use management and acquisition, source control, remedial actions and water quality standards. It emphasizes pro-active planning and management to build on the efforts of 208 comprehensive plans.
- Identify the best techniques and management tools to achieve and quantify water resource protection. Considerable emphasis will be placed on land use management and on increasing the coordination of management agencies.
- Place emphasis on efforts which will achieve visible and tangible improvements where impacts on various resources from nonpoint sources have been observed. The purpose of this policy is to generate public support, a perceived prerequisite for successful program implementation. The plan also emphasizes public education to raise public awareness of the visible improvements.
- Integrate the issue of nonpoint source pollution into the comprehensive state-wide water resources protection strategy focussing attention on several themes including: source reduction, resource protection and pollution prevention.

The process of developing the state's coastal nonpoint source management plan (coastal NPS plan) is still in a preliminary stage. Those involved at Massachusetts Coastal Zone Management (MCZM), the agency responsible for developing the coastal plan, are currently awaiting federal guidelines that will direct the coastal planning effort. It is anticipated that the goals of the coastal plan will be similar to the statewide NPS with a focus specifically on coastal issues. The coastal plan may establish a sequence for protecting the state's coastal waters based on a prioritization of polluted waters and pollution problems. As is the manner of the state-wide plan, this ranking will guide the disbursement of funds needed to implement pollution abatement programs. In addition, the CZM agent interviewed expected that the Advisory Committee for the state-wide NPS program will also serve as advisor to the coastal nonpoint source plan.

The state-wide NPS plan is organized in two main parts. One of the objectives of the plan is to focus management efforts to those areas of the state that are more affected by nonpoint source pollution. Consequently, the first part of the plan establishes these priority areas using the problems identified in the Nonpoint Source Assessment Report (1988). The process of assigning this statewide ranking was carried out by DEP with the approval of the Nonpoint Source Advisory Committee--a committee made up of representatives from federal, state, regional and local organizations which have an interest in nonpoint source pollution and management. The initial priorities include:

- The Quabbin/Wachusett reservoir system in conjunction with the Massachusetts Water Resources Authority (MWRA) and the Metropolitan District Commission (MDC).
- The Merrimack River watershed
- The Buzzard Bay Project
- An assessment of small streams and wetlands
- Integration of the NPS management plan into the state clean water strategy
- The North River
- Pontoosuc Lake, Berkshire County
- The development of a guidebook to educate and assist local land use managers in the application of nonpoint source control techniques and best management practices through zoning, subdivision and other local regulations -- "the Mega-Manual"
- The Westport River

For each of the projects listed above, the state-wide NPS management plan established a demonstration work program including an implementation strategy with regulatory and non-regulatory management actions and a schedule for project completion. An important part of these demonstration projects will be identifying appropriate management agencies for each site specific problem and the implementation of best management practices to control and address the identified problems. All of these projects are currently underway.

The prioritization of the state's waters has become an important issue because it influences the allocation of funds for nonpoint source abatement projects through section 319. The current ranking is based on a comparison of statewide problems. However, in order to be eligible for federal funding, the NPS management plan must develop its priority list on a watershed basis. This requirement emphasizes 319's intent to solve specific nonpoint source problems and achieve cost effective, visible results.

The importance of the prioritization issue is reflected by the Nonpoint Source Advisory Committee which elected a separate steering committee to develop the ranking process and work on other policy issues. The Steering Committee is currently proposing a set of criteria which will formalize the priority setting process. Consensus among the various interests of the Advisory Committee on the process of setting NPS

plan priorities is seen as essential to best direct the limited supply of 319 funds. Another issue of concern addressed by the Steering Committee is standardization of the review criteria used to evaluate proposals included in the state's yearly work plan.

The second part of the NPS management plan consists of:

- An identification of Best Management Practices and measures that can be used to reduce contamination from a wide range of nonpoint sources
- The development of a short-term state-wide strategy including analysis of what nonpoint issues or problems can be addressed by existing programs or regulations and what issues or problems require new initiatives and utilization of BMPs
- The development of a long-term state-wide strategy to address the frequent, pervasive and widespread nonpoint problems. Long-term management options may include regulatory revisions (e.g. Title 5) and legislative initiatives (e.g. stormwater runoff).

The short-term strategy included a discussion of problems and BMPs regarding:

- Silviculture
- Agriculture
- Construction
- Urban Runoff
- Resource Extraction
- Hydrologic/Habitat Modification
- Underground Storage Tanks
- Road De-icing Chemicals

The long-term strategy included:

- Revisions to Title 5
- Establishment of a soil and sedimentation law
- Implementation of stormwater runoff controls
- State-wide groundwater protection strategy
- Metropolitan Boston water supply watershed protection plan

The plan generally emphasized the importance of pollution prevention as well as clean up and remediation because of the extensive costs of resource restoration. It also recognized the critical need for coordination and sharing of resources among the many state, regional and local agencies responsible for nonpoint source pollution reduction. It concluded that, like other issues dependent on land use regulation, much of the responsibility for the abatement of nonpoint sources would fall to local governments.

This NPS management plan strategy was designed to be implemented over the course of four years. Regular evaluation and updates of the NPS plan and the Assessment Report were recommended in the NPS plan as part of the formal establishment of a state-wide nonpoint source management program. A focus of plan evaluation will be the ranking or priority assigned to various water resource areas in the state and best management techniques designed to reduce nonpoint source impacts.

The 205(j)5 program authorized the use of federal funds for the purpose of carrying out Section 319, i.e., to develop and implement a state's nonpoint source program. In Massachusetts, these funds have been employed since 1987 to create the state's Nonpoint Source Assessment Report and the NPS Plan. 205(j)5 funds also provided two years of funding for plan implementation.

Section 319 focuses clearly on the administration and implementation of a state's NPS Management Plan. 319 grants have four objectives:

- Support state activities for abating or preventing nonpoint source pollution that have the greatest likelihood of producing early, demonstrable water quality results, and that reduce ecological and health risks in areas of greatest concern.
- Award and manage nonpoint source grants in a manner that encourages and rewards effective performance by the states.
- Institutionalize state and local nonpoint source programs.
- Encourage strong relationships among federal, state, and local nonpoint source and nonpoint source-related programs and activities to create long-term program effectiveness.

Section 319 grants are administered in Massachusetts by the Division of Water Pollution Control, the lead agency for the state's nonpoint source program. EPA provides program guidelines that direct DWPC actions. 319 funds are available only for projects that are related to the implementation of the state's NPS Management Plan. Furthermore, EPA requires a NPS Plan make the most effective use of 319 funds by "identifying the sequence for protecting their waters based on a comparative analysis of the state's waters." Such a prioritization helps to focus the expenditure of limited 319 funds and can provide guidance for other federal and state agencies which may address nonpoint source pollution, including the National Estuary Program. Integration of the Nonpoint Source Plan with other water quality initiatives is strongly encouraged by EPA.

The DWPC agent interviewed for this review study estimated that the state received $600,000 to $700,000 of 205(j)5 funds in both 1988 and 1989. For 1990, the final year of 205(j)5 funding, he estimated the amount to be $200,000. That money currently funds six to seven staff positions at DEP and is used by DWPC for NPS plan administration and implementation projects, including public outreach, nonpoint source program enforcement and development of the "mega-manual".

Funding for 319 was authorized by the Water Quality Act. The amount available is dependent upon yearly allocations by Congress. The state received $383,687 in FY 1990 and will receive approximately $470,000 in FY 1991.

The allocation of 319 funds is determined by DEP in conjunction with the Nonpoint Source Advisory Committee and is overseen by EPA. Grants are administered by each EPA regional office and awarded to states. Each state, using priorities established in the NPS Management Plan, establishes a yearly work program which includes a base program, i.e., starting points for plan implementation, and an application for additional grants available competitively on a regional basis.

The final work program, made up of separate project proposals by state, regional, or local agencies, are reviewed by the Nonpoint Point Source Advisory Committee and then approved by the state agencies overseeing the NPS program. Final award of the 319 base and competitive funds is subject to EPA approval. Grants will cover 60% of the proposed work plan. The individual recipients of the grants through DEP are required to provide at least 40% of project funding.

Proposals for implementation projects can be accepted by DEP from a wide range of public and private agencies, including RPAs, state agencies, towns, watershed associations, conservation districts, and federal agencies. Proposals are selected competitively. The Advisory Committee has produced a ratings criteria and is preparing a package of information for proposal applicants. The 1991 workplan includes proposals from state agencies, RPAs and conservation districts.

Recipients for the two years of 205(j)5 funds in fiscal years 1988 and 1989 included the Soil Conservation Service, RPAs, the MDC, and a group of conservation districts. Projects included: watershed and groundwater management, underground storage tank management, statewide nonpoint source outreach and public education/technology transfer.

The 1990 319 recipients included:

- University of Massachusetts for Title 5 revisions
- MDC for rehabilitation of filter beds for Wachusett Reservoir, including implementation of BMP and associated monitoring program
- Conservation districts for a project regarding soil bio-engineering
- Cape Cod Commission for a groundwater monitoring project to assess nonpoint source impacts on Waquoit Bay

Applicability to Ongoing and Future Massachusetts Bays Program Efforts

One of the primary functions of the NPS plan and Assessment Report is to act as a vehicle for federal funds. Section 319 of the Clean Water Act requires that, in order to become eligible for the award of federal grants to implement nonpoint source programs, states must develop and receive EPA approval of a nonpoint source management plan. Through the 319 program, federal grants are made available to the state on an annual basis to implement approved plans. At the moment, the 319 program is the only grant program that focuses specifically on nonpoint source program implementation. Federal funding under 319 is not available for projects not listed in the NPS plan. Consequently, only those issues or demonstration projects identified in the NPS plan are eligible for funds.

MA DEP and the Advisory Committee are currently preparing the priority watershed list, and portions of Massachusetts Bays may be included. If some areas of the Massachusetts Bays watershed are designated as priority areas, they will be eligible to submit proposals for 319 funds. The Buzzards Bay watershed was designated as a priority area and has received direct assistance from the state NPS plan objectives. Since the control of nonpoint sources may be important to the implementation of the CCMP, the Massachusetts Bays Program should pursue 319 funding for any designated priority areas within the Massachusetts Bays Program watershed.

The process of gaining NPS plan designation for the Massachusetts Bays Program nonpoint source management goals can begin by placing a representative of the Massachusetts Bays Program on the NPS Advisory Committee. This body has several responsibilities regarding NPS program policy and the allocation of the state's allotment of 319 funds. Representation on the Advisory Committee is especially important in relation to the development of the Coastal plan. There is an important opportunity here to incorporate the Massachusetts Bays Program goals with CZM planning and ongoing implementation programs.

The Massachusetts Bays Program and NPS plan share two important objectives regarding plan implementation. The first is a focus on engaging more effective local action to control nonpoint sources associated with land use. The second is a recognition of the need to improve the degree of coordination among the various management agencies at the state, regional and local levels. The NPS plan has taken some action in these areas which may prove useful to the Massachusetts Bays Program.

The Massachusetts Bays Program can take advantage of NPS work done to continue outreach and technical assistance to local decision makers and improve local regulatory control. As identified in the NPS plan priority list, DWPC has been developing a guidebook to help local planning boards, boards of health and conservation commissions implement more effective nonpoint source control programs. This guidebook--dubbed the "Mega-Manual" because of its size and comprehensive approach to NPS problems and management options--will contain information regarding the establishment of substantive, long term control programs at the local level. In addition to an extensive discussion of nonpoint source problems and potential threats associated with land uses, the manual will describe the authority and responsibilities of the local boards and emphasizes an interdisciplinary--board/commission approach to formulate a comprehensive land management plan.[1] Because the Massachusetts Bays Program and NPS plan share many goals regarding the reduction of nonpoint source pollution, this manual will be directly applicable to Massachusetts Bays Program goals.

Section 319 has direct applicability to the goals of Massachusetts Bays Program, a fact identified by the 1991 EPA 319 guidance document that outlines the disbursement of 319 funds. In an effort to integrate nonpoint source programs with other water quality initiatives, EPA guidelines strongly encourage states to coordinate the development of their nonpoint source program priorities with the objectives of other elements of a state's clean water strategy, including Section 320, the National Estuary Program. It should be a goal of the Massachusetts Bays Program to promote its objectives as an important part of the statewide and coastal NPS plans, and gain acceptance of the CCMP into NPS plan priorities.

The integration of Massachusetts Bays Program goals into the NPS plan will allow federal funding for demonstration projects to control nonpoint source pollution into Massachusetts Bays Program waters. The designation is important because there are few other grant programs that specifically address nonpoint source problems.

[1] It should also be noted that in December 1990, the Legislature passed an amendment to M.G.L. Chapter 41, Section 81D which better defined the content of a Comprehensive Plan (The first change in this definition since its passage in the 1930's). However, due to the fact that local planning boards are required to produce a Comprehensive Plan but the scope of that plan was recently expanded, the State Auditor's Office has ruled this a mandate under the provisions of Proposition 2 1/2. Thus, while most communities will now avoid developing a Comprehensive Plan until the state provides the needed funding, if such a plan is produced, its minimum content is legally specified.

B. SECTION 205(J)1/604(B)

Introduction

Sections 205(j)1 and 604(b) of the federal Clean Water Act authorize the award of grant monies to the states for the purpose of funding water quality management planning. In Massachusetts, these grants are administered by the Department of Environmental Protection (DEP). In the past, DEP has awarded grants to Regional Planning Agencies (RPA) for specific water quality planning projects. Since 1989, grants have been available to a wider variety of organizations. Recent projects include: municipal groundwater supply protection, inter-municipal agreements for septage management, and regional aquifer protection strategies. All funding through 205(j)1 has ended, and grants are now available through Section 604(b).

Program Description

The goal of this program is the provision of funds for water quality management planning, including the development of strategies to protect surface and groundwater resources. In its award of past 205(j)1/604(b) planning grants, DEP has placed priority on specific topics related to water quality. A review of recent studies revealed a strong emphasis on the development of strategies to protect local groundwater supplies. These projects often included extensive data collection and analysis, resource mapping (e.g., the delineation of zone II's and analysis of the effect of existing, local land use controls and development bylaws on ground water quality). The reports generally stress the importance of local implementation of water resource protection programs and typically recommend the development of comprehensive groundwater protection strategies at the local level, which include amendments to local development regulations. Several reports recommended the institution of inter-municipal or regional agreements among neighboring communities to protect shared resources. Other themes presented by 205(j)1/604(b) reports were: the importance of coordination among local boards i.e. planning boards, boards of health, conservation commissions, and similar governing bodies, and the need to emphasize citizen participation and local buy-in for water resource protection. This last point was seen as essential for plan implementation in several reports, although it is not a theme identified by the 205(j)1/604(b) program.

In its award of 1991 grants, DEP will prioritize those projects which include multi-community involvement and encourage the establishment of permanent water resource protection committees to facilitate program implementation. DEP's priority project topics include:

- **Wellhead or Watershed Protection of Public Water Supplies**

  Grants will be targeted toward communities which have experienced closure of public water supplies and/or communities which have systems in which volatile organic compounds have been detected. Projects should include:

  - Land use evaluation including resource mapping and identification of potential sources of contamination
  - Analysis of the adequacy of existing water resource protection regulations
  - Analysis of options for multi-town coordination

- **Merrimack River Basin Water Supply Protection**

  Projects should complement DEP's ongoing initiative for the river basin and emphasize the protection of shared resources and the implementation of intermunicipal agreements for resource protection.

- **Contingency Planning for Public Groundwater Supplies**

  Projects should focus on the development of contingency plans in accordance with the Safe Drinking Water Act amendments for the provision of alternative drinking water supplies in the event of primary supply contamination. Emphasis should be on assessment of regional resources and the development of regional cooperative agreements.

Funding for this program comes from Section 205(j)1 and Section 604(b) of the Clean Water Act administered in Massachusetts by the Department of Environmental Protection. All future funds will be administered through 604(b), the successor to 205(j)1. The 604(b) program is expected to be funded through 1994 when federal legislation comes up for reauthorization. To date, funding has totaled $703,827 with a $281,065 "pass through" in FY 1991.

Since 1987, an EPA mandate has required that DEP "passthrough" 40% of the state's allotment of 205(j)1/604(b) funds to regional, public, comprehensive planning organizations and interstate organizations. In 1990, 10 of the state's 13 regional planning agencies received grants ranging from $26,000 to $37,500 (a statewide total of $264,000) to fund projects related to water quality protection. The 1991 funding amount available for passthrough is expected to be $281,065. Grants to 1991 recipients are not expected to exceed $40,000 per award.

The 60% share of the total 604(b) funds, not passed through to the RPAs, is used within DEP. The FY 1991 share, $422,762, will be spent to support 604(b) program administration and DEP overhead. A DEP official interviewed indicated that these funds will also support 7.85 staff positions and fund 604(b) workplans, quarterly reports to EPA, mapping projects and in-house planning efforts. More research should be done to determine how DEP's share of 604(b) funds are used in order that Massachusetts Bays Program can better coordinate its activities with DEP, especially relative to demonstration and Mini-Bays grants.

Regional Public Comprehensive Planning Organizations and Interstate Organizations are eligible recipients of funds through this program. In the past, grants were awarded solely to regional planning agencies. However, pursuant to a 1989 EPA mandate, grants are now available to other regional organizations chartered with appropriate powers. Grants will be awarded competitively among regional planning agencies, councils of state governments, cities, counties and other sub-state agencies and inter-state agencies. While grants are now available to a wider variety of organizations, DEP has emphasized that applicants must represent regional interests. All the regional planning agencies in the Mass Bays study area have received funds through the 205(j)1/604(b) planning grant program.

Below are discussions of two planning initiatives undertaken through the 205(j)1/604(b) planning program in the Massachusetts Bays Program area. These projects include the following reports as examples of the type of 205(j) work underway or completed:

(1) CCPEDC/Cape Cod Commission 1989 "Harwich and Brewster Wellhead Protection Project"
(2) MVPC 1991 "Merrimack Valley Groundwater Protection Report"

CCPEDC/Cape Cod Commission -- Harwich/Brewster Wellhead Protection Project

During 1989 and 1990, the CCPEDC and its successor the Cape Cod Commission, conducted an extensive hydrogeologic investigation and land use survey in the area surrounding two public water supply wells in Harwich and Brewster. The project, which made extensive use of Geographic Information Systems (GIS) data, provided hydrogeographic and land use data sufficient to meet DEP's requirements for Zone II, Zone of Contribution (ZOC) delineations. As a result of the project, both towns have increased their ability to enact detailed water supply protection measures.

The project involved:

- A complete hydrogeologic investigation of each wellhead including time of travel zones to help track pollutants
- A thorough land use survey in each zone II including the identification of potential contamination sources and evaluation of nitrogen loading impact
- Use of GIS data to provide precise mapping and better foundation for regulatory measures enacted to protect water quality
- A comprehensive action plan for groundwater quality protection

Recommendations included:

- Revisions to local water protection districts to reflect new designations
- Incorporation of time of travel information into local emergency spill response programs
- Strengthening and specifying regulations regarding hazardous land uses; mandate the removal of underground storage tanks over thirty years in age
- Require nitrogen loading analysis impact of all subdivisions
- Conduct hazardous household waste pickup programs

MVPC -- Merrimack Valley Groundwater Protection Project (1991)

During 1989 and 1991, the MVPC conducted a regional groundwater protection project to inventory and map underground storage tanks (USTs) and septic systems within the ZOCs to public water supply wells in four towns: Georgetown, Groveland, Merrimac and Newbury. The project was undertaken with the cooperation of DEP, the state fire marshall's office, local boards of health, water departments and fire departments. Its purpose was to compile information on the location, size, ownership, age, structural composition and chemical contents of commercial, municipal, and residential USTs in the four communities. Locations of the USTs and subsurface septic systems were mapped to identify potential contamination risks to the towns' groundwater resources.

The project also included public outreach efforts which included a series of public meetings with local health and fire officials, and a regional workshop on UST management. The report and workshops sought to improve local control of USTs and presented a methodology for developing, inventorying, and regulating underground tanks in small communities constrained by volunteer boards and tight budgets.

The project made several contributions toward groundwater protection:

- The development of expanded databases on USTs and septic systems in primary recharge areas
- Heightened public official awareness of the water quality implications of UST mismanagement and the need for strict tracking of UST installations at the local level
- The initiation of local board and department actions to enhance groundwater resource identification and wellhead protection

Applicability to Ongoing and Future Massachusetts Bays Program Efforts

The 205(j)1/604(b) water quality management and planning grant program has immediate applicability to the Massachusetts Bays Program for several reasons.

Duration and Continuity

The past eight years of federal planning grants for groundwater protection has established the 205(j)1/604(b) program as a reliable source of funding for regional and local groundwater protection. During the past three years alone, DEP has awarded an average of 12 grants per year to regional planning agencies amounting to approximately $830,000, for an average of $20,000 per grant. This represents a significant investment in local/regional solutions to groundwater pollution problems. DEP and EPA administrators have indicated that the emphasis on groundwater will continue for the near future. The 205(j)1/604(b) grants program will continue at least through 1994.

Compatible Goals

Although 604(b) and the Massachusetts Bays Program are not directed toward the same specific goals, the protection of groundwater quality through 604(b)can help achieve Massachusetts Bays Program objectives. As identified by the Buttermilk Bay case study in the Buzzards Bay Project Final Draft CCMP (5/91), groundwater can contribute a significant amount of pollution to coastal water quality. That report found that 85% of the nitrogen entering Buttermilk Bay was transported by groundwater. Similar conditions may prevail in Massachusetts Bays Program communities. Preceding groundwater protection planning accomplished under 205(j)1/604(b) can provide a proven model for the control of groundwater contamination. Furthermore, recent 205(j)1/604(b) reports represent a significant source of information that may be helpful to Mass Bays efforts to determine the impact of groundwater on its coastal estuaries.

In addition, the 205(j)1 reports reviewed herein placed significant emphasis on identification and abatement of non-point sources of groundwater contamination, including pesticides, stormwater runoff and septic systems. Recommendations made pursuant to those reports seek to implement strategies to reduce identified nonpoint sources by controlling those land use activities which cause the problems. In coastal communities, these regulations, even though they are aimed at protecting groundwater drinking supplies, will have the effect of decreasing the pollution content of surface water runoff which may eventually enter coastal waters. These 205(j)1 implementation programs designed to protect groundwater quality may, in this fashion, help improve coastal water quality.

Pollution Prevention

Both the 205(j)1/604(b) program and Massachusetts Bays Program stress the importance of pollution prevention, in addition to pollution remediation.

Agency Cooperation

The 205(j)1/604(b) projects reported that the management of groundwater resources by its nature requires the involvement of a diversity of land use agencies. Consequently, the reports surveyed outlined a comprehensive approach to groundwater protection that requires the involvement of several local regulatory boards including planning boards, boards of health and conservation commissions. Most recommended the adoption of local aquifer protection bylaws that delineated specific actions to be taken by these and other local boards. Most included model aquifer protection district bylaws as part of the report. In addition to individual agency actions, the reports recommended improved coordination and communication among these boards. Increased cooperation among local boards was seen as an important element of groundwater protection strategies.

Like groundwater, coastal water resources are threatened by many non-point sources, sources that are usually under the jurisdiction of local governments. Also similar to groundwater a strategy designed to protect coastal waters will require a comprehensive approach and coordination of local regulatory activities. The work accomplished under the 205(j)1/604(b) program to develop more coordinated and comprehensive local resource protection programs is directly applicable to Massachusetts Bays Program goals for coastal water quality.

Regional Cooperation

In addition to the focus on local solutions, several of the 205(j)1/604(b) reports recommended the development of regional agreements for groundwater protection. This reflects the stated DEP priority to award grants to agencies that propose inter-municipal cooperation. It also reflects a growing awareness that protection strategies to protect groundwater resources which transcend municipal boundaries will require inter-municipal cooperation.

Given the wide geographic range and the nature of the pollution problems in the Massachusetts Bays Program study area, the CCMP may include regional resource protection options. Several good models for regional protection strategies have been developed using 205(j)1/604(b) grants that may be useful to the Massachusetts Bays Program. The 1989 Barnes Regional Aquifer Protection report prepared by the Pioneer Valley Planning Commission provides a good example of such a regional agreement.

C. SECTION 303(E) BASIN PLANNING

Introduction

The 303(e) basin plans were prepared in accordance with PL92-500, the Federal Water Pollution Control Act amendments of 1972. These plans were completed in order for Massachusetts, its municipalities, and its districts to qualify for federal sewerage treatment construction funds. These plans were based primarily on current water quality problems and, therefore, were short-term in nature. The 303(e) plans focused on surface water pollution. Based on water quality testing that occurred, these basin plans determined the constraints for waste discharges based on current waste load allocations. They determined the degree of treatment needed to meet federal and state water quality standards.

Program Description

A 303(e) basin plan is a water quality-oriented document which is based on the most recent water sampling/monitoring data available. The plan's primary functions are:

- Establish pollution abatement priorities within each basin based on present water quality
- Establish effluent limitations for individual discharges necessary to meet water quality standards
- Establish schedules of compliance or target dates for abatement of pollution
- Identify and establish controls for non-point pollution sources (in fact was mainly left to 208 to perform this analysis)
- Identify further studies needed regarding future water quality goals
- Evaluate and, if needed, propose new water quality standards
- Establish monitoring and surveillance

The primary focus issues of the basin planning program are the following:

- Surface water
- River basins or fresh water versus the marine/saltwater focus of Massachusetts Bays Program
- Water quality was examined primarily by looking at: coliform bacteria, dissolved oxygen, solids, color, nutrients, Ph and metals, temperature and other items such as oil, pesticides and floating debris.

The 303(e) basin plans were authorized in 1972 and covered 25 river basins, except the Charles River Basin which was covered in the EMMA study (description immediately following). The state, through the Division of Water Pollution Control, conducted this planning effort from 1973 through 1990. Work in the later 1980's focused primarily on water sampling and monitoring to ensure that structural recommendations which were implemented were achieving desired results.

The 303(e) plans were utilized by the state and federal government. Treatment plants could not receive funding from either the federal or state government, which amounted to 90% of the total system cost, unless the need for such a facility had been detailed in the 303(e) basin plan. The availability of such an extensive public subsidy was a strong incentive to motivate local government(s) to act on their own.

However, if incentives alone did not work, the state had the authority to order cities and towns to correct verified pollution problems. If a community still failed to take the necessary actions, then the state could fine the municipality sizeable penalties, e.g., $20,000 per day, until they reached compliance. The state was assured payment of the fine by withholding the amount from the Cherry Sheet for Local Aid.

The program has combined state and federal funding. It is estimated the state has received $1 million per year for fifteen years; that was matched by another $1 million per year in state funds. This funding covered planning, intensive water quality surveys, simulation models, and monitoring. All work was done by state staff at the Division of Water Pollution Control.

Due to funding problems, there are no plans to continue 303(e) basin planning. The only way this could change is if the federal Clean Water Act, up for reauthorization this year, includes a renewed and funded federal emphasis on such basin plans.

Applicability to Ongoing and Future Massachusetts Bays Program Efforts

Unless federal law stipulates otherwise, the 303(e) basin planning effort has been concluded. However, there are still lessons to be learned from this program. Due to the implementation powers outlined in the introduction of this section, all inland structural recommendations were implemented, and the water quality of surface waters in this state vastly improved. However, coastal and CSO recommendations are still being "studied," due to a federal provision which enabled municipalities to seek a waiver of secondary treatment if they had a coastal outfall with primary treatment and it met water quality standards. All Massachusetts coastal communities sought this 301(h) waiver; only Gloucester was successful in obtaining this waiver.

The coastal priorities in the 303(e) plans have not changed:

1. Control of continuous discharges
2. Elimination of combined sewer overflows
3. Elimination of non-point pollution

There has been a federal and state emphasis on inland or fresh water pollution control. Very little 303(e) staff time was spent on saltwater or marine issues. Nationally, the state-of-the-art for marine sciences was behind inland waters due to the focus established by funding priorities.

It should be remembered that many treatment plants were brought on-line in the mid- to late 1970's. They have a design life of twenty years, and, therefore, are reaching their maximum capacity. Planning updates may be needed to determine if extensive population and economic growth is anticipated, and if the existing or even expanded plant can meet the state's new surface water classifications and the anti-degradation policy.

The major lesson from 303(e) is that plans can be implemented if funding and enforcement powers are applied by state and federal agencies as a follow-up to those plans.

EMMA STUDY

Wastewater and Engineering Study for Boston Harbor and the Eastern Massachusetts Metropolitan Area

This 27-volume study, done on behalf of the Metropolitan District Commission and the Army Corps of Engineers by Metcalf and Eddy, was approved by EPA as a substitute 303(e) basin plan. It began in 1973 and was completed in 1976, and was intended to guide MDC sewerage district decisions for the next 80 years.

The EMMA study region included 109 communities, or everything east of I-495, including communities bisected by this highway. It focused on the three major tributary rivers to the harbor and their pollution problems with respect to the harbor (i.e., Mystic, Charles, and Neponset).

The EMMA study, conducted in conjunction with a Citizens Advisory Committee and a Technical Subcommittee, had as its major purposes:

1. Determine the extent of the MDC sewerage district, including the communities to be served by Nut Island and Deer Island
2. Determine how large the interceptors, pumping stations, and treatment facilities should be when their upgrading becomes necessary
3. Determine the most critical problems to be addressed
4. Determine the cost of achieving water quality goals and how best they should be paid
5. Determine what type of management organization would work best

The major drainage areas included in this study cover many of those in the Massachusetts Bays Program area:

Boston Harbor	Taunton
North Coastal	South Coastal Area
Merrimack	Sudbury-Assabet-Concord
Blackstone	

The plan concluded that the 43-member sewer district should be expanded by only 8 more communities: Dover, Hopkinton, Lincoln, Lynnfield, Sharon, Southborough, and Weston. It also stated that CSO projects are needed for Dorchester Bay, the Charles River, Neponset River, and the Inner Harbor. It also recommended an advanced treatment facility for the Neponset River to be located in the Canton/Norwood area which would also handle the five upstream communities. The other structural solution outside of Deer and Nut Island was an advanced treatment facility on an island in the Charles River to handle Needham and the eight communities upstream.

In order to make these recommendations, the plan included population projections and consequent waste projections, and then broke the waste projections out by type, e.g., residential, commercial, and industrial. This data may be useful to the Massachusetts Bays Program socioeconomic planning work. The 1990 census data could be compared to EMMA population projections which are now fifteen years old. If population figures are within range, then the industrial, residential, etc. sewerage figures should still be useful.

D. COASTAL ZONE MANAGEMENT PLANNING

Introduction

Of all the water quality planning programs outlined in this "Review Report," the program with the highest potential for integration with the Massachusetts Bays Program is the Massachusetts Coastal Zone Management (MCZM) Program.

In 1972, the U.S. Congress actively acknowledged the critical importance of the country's coastal resources--and the pressures threatening them--by passing the Coastal Zone Management Act (CZMA) which offered financial assistance to the states to develop and implement comprehensive coastal management plans.

The Massachusetts program was developed through the combined efforts of the Legislature, local, state, and regional officials and hundreds of interested citizens. In 1978, the MCZM Program became the first on the eastern seaboard to be granted federal approval. In 1983, the MCZM Office was established by the Legislature as part of the Executive Office of Environmental Affairs (EOEA).

From 1978 through 1991, the Commonwealth has received, and equally matched, a total of $16.7 million in annual grants from the National Oceanic and Atmospheric Administration's Office of Ocean and Coastal Resource Management (OCRM) for implementation and continued development of the MCZM Program.

Unlike several other states, Massachusetts did not create its coastal management program as a regulatory body. Instead, the Commonwealth sought to take advantage of existing agencies and programs through a "networking" process. The MCZM Office would serve as a policy/planning group, provide technical and financial assistance, and include only the limited regulatory review process provided in the CZMA which allows participating states to review federal activities affecting the coastal zone to ensure that they are in compliance with the state's coastal program. Most of the implementation of the MCZM program is done by the various Departments and Divisions within the Commonwealth's environmental agencies.

The management system is embodied in a series of 27 Program Policies, 13 of which are directly supported by state statutes and regulations and 14 of which guide actions by state agencies. The Program Policies are incorporated directly or by reference into many state regulations and thereby have the force of law.

The program outlined below will focus on program activities within the MCZM Office and their relationship to the water quality efforts of the Massachusetts Bays Program.

Program Description

The goals of the MCZM Program are to protect or restore the quality of natural and man-made coastal resources by developing solutions to current problems and managing the multitude of uses supported by the coastal zone. As successive objectives have been accomplished, the focus of the MCZM Office has changed as outlined below.

- Wetlands Protection

  Resulted in the establishment of the Wetlands Coastal Protection Regulations.

- Protection of Georges Bank

  Resulted in active opposition by the state's Attorney General's office to all drilling proposals. In 1990, the U.S. Department of the Interior announced a drilling moratorium for Georges Bank. Mass CZM will continue to work for a permanent ban within the 400 meter isobath.

- Regional Cooperation and Local Capacity

  Resulted in the assignment of regional staff to four regional office sites presently located at:

  - Buzzards Bay, Marion
  - Cape Cod, Barnstable
  - North Shore, Gloucester
  - South Shore, Norwell

- Barrier Beaches

  Resulted in the signing of Executive Order 181 prohibiting any state agency from funding or permitting actions that would encourage development on barrier beaches.

- Harbors

  Resulted in passage of harbor planning funds and technical assistance program.

- Public Access

  Resulted in the amendment of M.G.L. Chapter 91 to clarify that the Chapter extended to filled tidelands and regulations mandating public access provisions prior to receiving a Chapter 91 license.

Current Objectives

- Water Quality Improvements to the Marine Environment
- Non-Point Pollution Sources

Seventy-eight communities fall within the Massachusetts Coastal Zone; however, its jurisdiction does not follow municipal boundaries. The Mass Coastal Zone includes the lands and waters within the area defined by: the seaward limit of the Commonwealth's three-mile territorial sea, extending from the Massachusetts/New Hampshire border south to the Massachusetts/Rhode Island border and landward for 100 feet inland of specified major roads, rail lines, or other visible rights-of-way. It also includes all of Nantucket, Gosnold, Martha's Vineyard, and Cape Cod. Presently, MCZM is re-examining these boundaries for possible extensions, especially in light of their current focus on non-point source pollution.

The federal CZM program began in 1972. It was reauthorized by Congress on November 5, 1990 for

another five years. Major new requirements for state coastal programs were included in that reauthorization. Therefore, Congress has indicated a strong commitment to coastal issues and continued federal funding.

Fiscal year 1991 federal CZM funding for Massachusetts is $1.23 million. The state meets its 50% matching requirement with in-kind contributions from other state-funded agencies whose actions help implement the MCZM Plan, e.g., DEM, DEP, FW&EE, etc. The federal funding comes from the National Oceanic and Atmospheric Administration (NOAA), while the Massachusetts Bays Program receives its funding through the National Estuary Program administered by the federal EPA. Since 1978, MCZM has received a total of $16.7 million in annual grants from NOAA. The U.S. Department of the Interior has also funded the MCZM Office for special projects. All of this funding remains with the MCZM Office. However, at the Secretary's discretion, some funding can be awarded to other state agencies that implement the overall CZM Program.

Applicability to Ongoing and Future Massachusetts Bays Program Efforts

The Massachusetts Bays Program is closely coordinated with the MCZM Office. On the state level, the Massachusetts Bays Program is located within the MCZM Office and the Office Director serves as the Chair of its Management Committee. At the federal level, NOAA and EPA signed a memorandum of agreement in 1988 in which EPA agreed that, as a matter of policy, final CCMPs will be submitted to the respective state CZM agencies for consistency review under CZMA Section 307 (further discussion of consistency is provided below). NOAA agreed that, to the extent permitted by law, approved CCMPs will be incorporated into state CZM programs, thereby serving as a vehicle for implementation.

In addition, under Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990, states with federally-approved CZM programs are required to develop coastal nonpoint source programs. State coastal nonpoint source programs must be approved by both NOAA and EPA. Guidance on this new program is under development.

The remainder of this section provides a brief description of some of the ongoing MCZM activities that directly relate to water quality and that would be directly applicable to the Massachusetts Bays Program.

Ongoing MCZM Activities

Federal Consistency Review

The federal Coastal Zone Management Act Section 307 mandates that: "Federal agencies [must] conduct or support activities if they affect natural resources, land uses, or water uses in the coastal zone, in a manner consistent 'to the maximum extent practicable' with approved state management programs."

The MCZM Office reviews all significant activities proposed within the coastal zone to ensure that proposed federally permitted, funded, or conducted activities are consistent with all MCZM Regulatory Program Policies as well as in compliance with related state regulations, executive orders, and policies. This consistency review applies to the CCMP to be prepared by Massachusetts Bays Program.

Once the CCMP is approved, it will be included as part of the state's Coastal Zone Management Plan. Thus, all federal actions that affect the coastal zone relative to that plan will be reviewed, and, if

necessary, negotiations entered to ensure the federal actions are consistent with the CCMP.

Wastewater Treatment Review

MCZM staff work with DEP relative to the siting of municipal wastewater treatment facilities that discharge to coastal zone waters. This can help improve marine water quality immensely. However, it is important that their discharges are planned so as not to impact marine resources on a broader scale.

Marine Head Discharges

CZM Office chairs an interagency task force on marine head discharges, and it is preparing recommendations and guidelines concerning the use of marine pump-out facilities and the designation of no-discharge zones in Massachusetts waters.

COASTSWEEP

This is an annual seashore/coastal area cleanup held during Coastal Zone Week each fall. This effort is financed through corporations and sponsored by MCZM.

Cape Cod Marine Quality Task Force

MCZM staffs this task force of the Cape Cod Commission. Its primary focus is cleaning up marine waters in order that shellfish beds, currently closed due to bacterial contamination, can be reopened.

Special Area Management Plans (SAMPs)

This is defined as an area that is special, unique, or serves a critical regional need. Examples of such "special areas" include ocean sanctuaries, designated ports, areas of critical environmental concern, or barrier beaches. Staff has produced guidelines on how to develop a SAMP and are available to provide technical assistance as the work proceeds.

Areas of Critical Environmental Concern

See full Program Description provided in Section F of this chapter.

Ocean Management Policies

The recent reauthorization of the federal CZMA contains a mandate for state coastal programs to develop ocean management policies. The reauthorization includes guidance for the development of the State Programs. All State Programs must include:

- implementation of management measures in conformity with EPA guidance
- identification of land uses which may cause or contribute to coastal water degradation
- identification of critical coastal areas
- implementation of additional management measures within the identified critical coastal areas
- technical assistance to local governments and the public to implement management measures

- opportunities for public participation
- mechanisms to improve coordination among State and local agencies
- modification of State coastal boundaries to include inland areas impacting coastal water quality.

This policy work should tie directly to ongoing Massachusetts Bays Program work and needs to be closely coordinated. This is an example of how the limited Massachusetts Bays Program resources could be stretched by incorporating CZM federally-mandated and funded work into the CCMP.

Harbor Planning

See Program Description provided in Section E of this chapter.

Shoreline Change Project

In 1989, MCZM Office produced shoreline change maps for much of the Commonwealth's outer shoreline showing its movement over the past 140 years over three or four time intervals. Massachusetts is only one of eight states with such information.

Coastal Non-Point Pollution Program Plan

See Non-Point Description in Section A of this chapter.

Gulf of Maine Project

In December 1989, the Governors of Massachusetts, New Hampshire, and Maine signed an agreement with the Premiers of New Brunswick and Nova Scotia to protect the environmental integrity of the Gulf of Maine. The Gulf of Maine Council on the Marine Environment and its Working Group has prepared a draft action plan and an environmental monitoring plan to preserve the Gulf's marine resources. As part of that effort, the Mass CZM Office will coordinate a $250,000 coastal data management program. CZM staff has offered to keep the Mass Bays Management Committee fully informed on the overall Gulf effort relative to possible Massachusetts Bays Program tie-ins and, in particular, to coordinate Massachusetts Bays Program data efforts with the Gulf data program.

Oil Spill Contingency Planning

This water quality program is a response and containment effort, as opposed to a pollution prevention program. CZM Office staff are available to help local communities establish Local Response Plans. In addition, Congress enacted the 1990 Oil Pollution Control Act which mandates the development of Area Contingency Plans by new area response teams. The CZM anticipates helping communities understand the federal, state, and local roles required to respond to an oil spill. Information such as equipment needed, potential for regional acquisition of that equipment, and "special resource areas" needing prioritized protection from spills will be provided. Communities also need help in understanding when to call DEP, CZM, Massachusetts Civil Defense, and/or the Coast Guard. Regrettably, there is no funding available for this contingency response planning.

Citizen Participation

The broad and diverse Coastal Zone Management Program also includes a citizen participation component. This group is called CRAB, or Coastal Resources Advisory Board. It is composed of sixteen individuals appointed by the Secretary of EOEA. They advise the Secretary on general coastal policy issues and general administrative issues concerning the CZM Office and its multi-state agency coordination.

In addition to this policy advisory board, special task forces are created when more detailed, project-specific work is being undertaken. For instance, a task force is presently developing technical criteria for performance standards relative to development allowed in floodplains. Those standards will be incorporated into the regulations implementing the State Wetlands Act and applied on a project-by-project basis.

MASS COASTAL ZONE POLICIES

Policy 1	Protect ecologically significant resource areas (salt marshes, shellfish beds, dunes, beaches, barrier beaches, and salt ponds) for their contributions to marine productivity and value as natural habitats and storm buffers.
Policy 2	Protect complexes of marine resource areas of unique productivity (Areas of Preservation or Restoration (APRs)/Areas of Critical Environmental Concern (ACECs)); ensure that activities in or impacting such complexes are designed and carried out to minimize adverse effects on marine productivity, habitat values, water quality, and storm buffering of the entire complex.
Policy 3	Support attainment of the national water quality goals for all waters of the coastal zone through coordination with existing water quality planning and management agencies. Ensure that all activities endorsed by CZM in its policies are consistent with federal and state effluent limitations and water quality standards.
Policy 4	Condition construction in water bodies and contiguous land areas to minimize interference with water circulation and sediment transport and to preserve water quality and marine productivity. Approve permits for flood or erosion control projects only when it has been determined that there will be no significant adverse effects on the project site or adjacent or downcoast areas.
Policy 5	Ensure that dredging and disposal of dredged material minimize adverse effects on water quality, physical processes, marine productivity, and public health.
Policy 6	Accommodate offshore sand and gravel mining needs in areas and in ways that will not adversely affect marine resources and navigation.
Policy 7	Encourage the location of maritime commerce and development in segments of urban waterfronts designated as port areas. Within these areas, prevent the exclusion of maritime-dependent industrial uses that require the use of lands subject to tidelands licenses.
Policy 8	For coastally-dependent energy facilities, consider siting in alternative coastal locations. For non-coastally-dependent energy facilities, consider siting in areas outside of the coastal zone. Weigh the environmental and safety impacts of locating proposed energy facilities at alternative sites.
Policy 9(a)	Accommodate exploration, development, and production of offshore oil and gas resources while minimizing impacts on the marine environment, especially on fisheries, water quality, and wildlife, and on the recreational values of the coast, and minimize conflicts with other maritime-dependent uses of coastal waters and lands. Encourage maritime-dependent facilities serving supply, support, or transfer functions to locate in existing developed ports.

Policy 9(b) Evaluate indigenous or alternative sources of energy (coal, wind, solar, and tidal power) and offshore mining to minimize adverse impacts on the marine environment, especially with respect to fisheries, water quality, and wildlife, and on the recreational values of the coast.

Policy 10 All development must conform to existing applicable state and federal requirements governing sub-surface waste discharges, sources of air and water pollution, and protection of inland wetlands.

Policy 11 Protect designated scenic rivers in the coastal zone. Support designation of areas for preservation or restoration as "sign-free areas."

Policy 12 Review proposed developments in or near designated or registered historic districts or sites to ensure that federal, state, and private actions requiring a state permit respect their preservation intent and minimize potential adverse impacts.

Policy 13 Review developments proposed near existing public recreation sites in order to minimize their adverse impacts.

Policy 14 Encourage and assist commercial fisheries research and development, restoration, and management of fishery resources, development of extensive and intensive aquaculture, and enhancement of anadromous fisheries, initiated at local, state, and federal levels.

Policy 15 Ensure that state and federally-funded public works projects proposed for location within the 100-year coastal floodplain will:

(a) Not exacerbate existing hazards or damage natural buffers
(b) Be reasonably safe from flood and erosion-related damage
(c) Not promote growth and development in damage-prone or buffer areas, especially in undeveloped areas of APR's

Policy 16 Encourage acquisition of undeveloped hazard-prone areas for conservation or recreation use, and provide technical assistance for hazard area zoning and mitigation of erosion problems.

Policy 17 Provide funding for protection from tidal flooding and erosion, emphasizing the use of non-structural measures where feasible.

Policy 18 Encourage, through technical assistance and review of publicly-funded development, compatibility of proposed development with local community character, and scenic resources.

Policy 19 Promote the widest possible public benefit from channel dredging, ensuring that designated ports and developed harbors are given highest priority in the allocation of federal and state dredging funds. Ensure that this dredging is consistent with marine environmental policies.

Policy 20 Encourage, through technical and financial assistance, expansion of water-dependent uses in designated ports and developed harbors, redevelopment of urban waterfronts, and expansion of visual access.

Policy 21 Improve public access to coastal recreation facilities, and alleviate auto traffic and parking problems through improvements in public transportation. Link existing coastal recreation sites to each other or to nearby coastal inland facilities via trails for bicyclists, hikers, and equestrians and via rivers for boaters.

Policy 22 Increase capacity of existing recreation areas by facilitating multiple use and by improving management, maintenance, and public support facilities. Resolve conflicting uses whenever possible through improved management rather than through exclusion of uses.

Policy 23 Provide technical assistance to developers of private recreational facilities and sites that increase public access to the shoreline.

Policy 24 Expand existing recreation facilities, and acquire and develop new public areas for coastal recreational activities. Give highest priority to expansion or new acquisitions in regions of high need or where site availability is now limited. Assure that both transportation access and the recreational facilities are compatible with social and environmental characteristics of surrounding communities.

Policy 25 Encourage energy conservation and the use of alternative sources such as solar and wind power in order to assist in meeting the energy needs of the Commonwealth.

Policy 26 Ensure that state and federally-funded transportation and wastewater projects primarily serve existing developed areas, assigning highest priority to projects which meet the needs of urban and community development centers.

Policy 27 Encourage the revitalization and enhancement of existing development centers in the coastal zone through technical assistance and federal and state financial support for residential, commercial, and industrial development.

E. HARBOR PLANNING

Introduction

There has been an evolution of coastal planning in Massachusetts. At first, the focus was on the water resource itself. This expanded to include related land resources such as barrier beaches and filled tidelands. These land features were included for their natural resource characteristics more than for their general use. In the mid 1980's, it became clear that a more comprehensive approach to coastal planning was needed, and this would have to include a thorough examination of the working harbors of Massachusetts, including functions served, relationship to state and local economies, as well as natural resource contributions.

At first, technical assistance was provided by Massachusetts Coastal Zone Management (MCZM) staff to local groups interested in protecting their harbor. Recently, state funds have been made available to help communities defray some of the costs of conducting these planning efforts. In addition, MCZM has recently promulgated regulations pertaining to the implementation of M.G.L. Chapter 91, which regulates if and how development can occur within the Commonwealth's tidelands. These regulations include a provision for a Massachusetts Department of Environmental Protection waiver if a MCZM EOEA approved harbor plan exists for the area under review.

Described below are two components of the CZM harbor planning program--the Harbor Planning Grants Program (HPGP) and the regulatory program for state review and approval of Municipal Harbor Plans (MHP).

Program Description

Municipal Harbor Plans set forth:

1. a community's general goals and objectives for a harbor planning area and applied policies;
2. an implementation program which specifies the regulatory and non-regulatory measures which will govern utilization of harbor waters and lands;
3. a planning analysis which utilizes data, community input, and other information for evaluating alternative courses of action;
4. a review of the public participation process which contributed to the development of the plan;
5. other elements deemed necessary by the Secretary.

General goals for the MCZM Harbor Planning Program include: preserving and enhancing the harbors of Massachusetts so as to ensure water quality, protecting natural resources, incorporating harbors into local and/or regional plans, preserving and promoting traditional water-dependent activities, and determining appropriate amount and location of non-water-dependent development. More specific goals include:

- Promoting long-term, comprehensive, municipally-based planning of harbors and other waterway areas which fully incorporate state policies governing stewardship of trust lands, as defined in the Massachusetts Tidelands legislation and which establish, through

early and continuing consultation, an effective partnership between the Commonwealth and its municipalities in such planning efforts

- Carrying out overall state environmental policy by, among other things, providing for the management of water and land resources to assure the protection and balanced utilization of such resources; promoting the best usage of land and water by encouraging and providing for, in cooperation with other appropriate state agencies, planned industrial, commercial, recreational, and community development; encouraging the restoration and reclamation of degraded or despoiled areas, including harbors and coastal waters; and assisting other state and regional agencies in developing programs and policies relating to land use planning and regulation in the Commonwealth

State funding for the development of municipal harbor plans is available from the MCZM Office under the HPGP program. This funding is authorized as part of the Coastal Facilities Improvement Program (CFIP) which is funded through a General Obligation Bond. CFIP has an authorization of up to $10 million, and Harbor Planning Grants can be made for up to 10% of that figure, or $1 million. However, currently, due to state fiscal problems, Secretariats are not being allowed to access their full bonding authorization. Therefore, Harbor Planning Grants funds have been limited to $137,500, and 100% of these funds were allocated in the first round of grants. Harbor Planning Grants may cover up to 50% of the cost of the plan, with the local match including in-kind contributions, as well as cash contributions.

In order to obtain harbor planning financial assistance through the HPGP an application must be filed which includes:

- Establishment of the need for a comprehensive harbor plan
- Description of the capability to complete a harbor plan
- Outline of methodology and structure and planning process
- Draft scope of work of the plan

Recipients of HPGP funds include the following:

Recipient	Status
Dennis	Planning work underway
Nantucket	Draft plan before CZM for review
New Bedford/Fairhaven	Planning work underway
Newburyport	Plan before CZM for review
Truro	RFP under development
Wareham	Planning work underway
Wellfleet	Planning work underway
Weymouth	Plan before CZM for review

In addition to funding under the HPGP, municipalities may obtain approval of their harbor plans from the Massachusetts Secretary of Environmental Affairs in order that such approved plans may serve to guide EOEA agency actions affecting the implementation of waterway management programs at the local level. State review of harbor plans ensures:

- that the harbor plans are comprehensive and tie into overall community goals and objectives defined as Community Vision.

- that the relationship between land-side and water-side issues is fully understood and incorporated into the planning.
- high-quality citizen participation and involvement of all locally-pertinent boards and agencies.
- that good data collection and analysis occur to justify options and decisions made.
- that harbor policies are carried out through pragmatic and enforceable implementation measures.

This plan review is particularly important relative to DEP's administration of M.G.L. Chapter 91 when licensing or permitting waterfront development. Cities and towns can apply local height, setback, and other dimensional requirements to non-water-dependent projects, as well as substitute acceptable forms of land use through this harbor planning mechanism.

In order to acquire an EOEA-approved plan, the municipality at the outset of its planning process must file a written request with the EOEA Secretary for a Scope for the local or regional plan. This request must include, at a minimum, the following information:

(a) A description of the harbor planning group and any staff or consultants that will be available to such group; in the case of a harbor shared by more than one municipality, such description must identify any arrangements that have been made for collaborative or coordinated planning efforts

(b) An appropriately-scaled map identifying the proposed harbor planning area and showing street names, buildings, topography, navigation channels, and other key reference points as appropriate

(c) A concise historical narrative of land and water use and development in the harbor planning area, and a summary of current problems, opportunities, and other harbor planning issues

(d) A review of planning efforts undertaken to date, and a discussion of any results thereof and how such results will be incorporated into future planning efforts

(e) A proposal detailing how the municipality intends to incorporate the relevant provisions of the Harbor Planning Guidelines in the course of developing a municipal harbor plan; in particular, the proposal shall include the following elements:

(1) A participation program that includes early and continuing interaction with the public; close coordination with municipal boards, committees, and officials having jurisdiction over land and/or water resources affecting the harbor planning area, including those of neighboring municipalities as appropriate; and consultation with affected state, regional, and federal agencies, including those owning real property or otherwise responsible for the implementation of plans or projects in the harbor planning area

(2) A study program which identifies the sources of information and methods of analysis to be employed in conjunction with such key planning functions as the establishment of boundaries and inventory of resources; the identification and

prioritization of relevant issues; the formulation of goals, objectives, and policies; and the assessment of alternatives, impacts, and tradeoffs to inform the choice of preferred courses of action

(f) A listing of CZM policies and tidelands policy objectives that are relevant to the planning effort, and of the specific provisions of the waterways regulations whose application within the proposed harbor planning area is likely to be affected by the plan

When the Secretary receives such a request, a Scope is developed and notice of issuance of the Scope is published in the MEPA Environmental Monitor. As stated in 301 CMR 23.03(4), the Scope submitted to the municipality shall include, but not be limited to, specifications as to how the Harbor Planning Guidelines are to be applied to the municipality and a listing of additional information and analysis required to determine whether the plan complies. Special emphasis will be placed on including all state agencies with "legal jurisdiction or special expertise relative to the matters under consideration, including, but not limited to, DEP, DEM, and state agencies owning real property or otherwise responsible for the implementation of plans or projects within the harbor planning area."

Once a Scope has been issued, the plan must be drawn up in accordance with its provisions. A proposed plan must be submitted to the EOEA Secretary, within two years of the Scope being issued, for review and approval. In order to attain approval, the plans must comply with the following standards (contained in 301 CMR 23.05):

- The plan must be consistent with the Harbor Planning Guideliens of CZM including the Scope and any written statement of the Secretary relative to how such guidelines are to be applied to the municipality.
- The plan must be consistent with all CZM Policies, as applicable.
- The plan must be consistent with state tidelands policy objectives and associated regulatory principles, as set forth in the waterways regulations of DEP.
- The plan must include all feasible measures to achieve compatibility with the plans or planned activities of all state agencies owning real property or otherwise responsible for the implementation or development of plans or projects within the harbor planning area.
- The plan must include enforceable implementation commitments to ensure that, among other things, all measures will be taken in a timely and coordinated manner to offset the effects of any plan requirement less restrictive than that contained in the waterways regulations.

The Secretary may qualify, limit, or otherwise condition such approval. This approval is good for five years before the plan must be reviewed for potential updating, although amendments may be filed at any time. It should be noted that proposed amendments must also go through the review and approval process.

Presently, Boston is the only city with a state approved plan, which covers much of Boston's waterfront. Because it was started prior to the promulgation of this regulation, this plan was reviewed under special transition procedures applicable to plans in progress which were filed with EOEA by January 12, 1991. Two plans presently submitted under these transition procedures of 301 CMR 23.09, are being done by Chatham and Mashpee.

Applicability to Ongoing and Future Massachusetts Bays Program Efforts

The Harbor Planning Program can be an important planning and implementation tool. Harbor Plans are developed locally and are comprehensive in their scope, tying together the economy, aesthetics, and resource protection. When water quality is a primary issue, the plan addresses and inventories water quality conditions for the harbor's drainage basin, as opposed to just the harborfront. Other items to be inventoried under these conditions include:

(1) Flushing rate of the harbor (length and number of tidal cycles required)
(2) Sediment types, transport and distribution patterns throughout the harbor
(3) Natural and man-made impediments to flushing the harbor
(4) Amount of drainage into the harbor (off land, riverine, non-point surface run- off , and septic systems)
(5) Number, location, and size of storm drains
(6) Number, location, and composition of other point discharges, particularly industrial discharges
(7) Nature and extent of commercial and recreational fishing activity for shellfish, finfish, and crustaceans
(8) Status of DMF shellfish sanitation testing
(9) Disposal practices of boatyards in scraping, sanding, and painting boats
(10) Number of marine head discharges and pump-out facilities
(11) Identification of sanitary waste handling practices and dredge material classifications
(12) Number of fuel handling facilities and adequacy of fuel handling practices, including location, construction, installation, and inspection of storage tanks
(13) Number of transient vessels in the harbor, length of stay, and estimated volume of any discharges
(14) Cumulative impacts of harbor-wide nutrient loading

Other important components of these harbor plans include: maps, an inventory of all man-made resources in the harbor planning area, an inventory of all natural resources, and extensive data analysis. Plans must contain enforceable implementation measures, which may include:

- Waterfront land use controls, e.g., reservation of tidelands for predominantly public use and appropriate development or no development of flood-prone areas
- Water management for user groups such as commercial fishermen, shellfishermen, recreational boaters, large industrial shipping, swimmers, aquaculture, and even windsurfers
- Harbor improvement financing
- Natural resource management
- Dredging master plan
- Permanent harbor management designation

All of this work ties directly to the scope of the CCMP. It should be noted that harbor plans are underway now; therefore, they provide an opportunity to collect needed information, data, and maps from the communities for incorporation into the Massachusetts Bays Program data bank. On the other hand, the Massachusetts Bays Program and EOEA's GIS staff may already have some of the locally-needed information; thus, an ongoing exchange could be arranged now, cementing good program relationships

with those who have the authority to implement many of the future CCMP recommendations.

Efforts should be made to ensure that state and local data collection is coordinated concerning who is collecting what, in what format, and on scales useable by both parties. It appears that current-state GIS files are not on a scale to be useable for the lot-by-lot analysis described in the CZM Harbor Planning Guidelines.

Another important aspect of this program is that Municipal Harbor Plans (MHPs) approved under CMR 23.00 will have the "power of law" relative to their enforcement locally and by DEP. Thus, these local or inter-local plans will have more authority than the CCMP. Massachusetts Bays Program staff should be included in all scoping and plan review meetings relative to MHPs. It is highly unlikely that municipal waivers could be granted for anything that would be in conflict with the CCMP as it evolves over the next five years, but staff involvement from the outset should add some insurance.

In summary, harbor plans will be a very important part of Massachusetts Bays Program efforts. If they are truly as comprehensive as described in the MCZM Harbor Planning Guidelines and achieve local adoption, then their implementation will also implement the CCMP. Thus, ongoing coordination is needed now to ensure the maximum reciprocal benefit.

F. AREAS OF CRITICAL ENVIRONMENTAL CONCERN

Introduction

The designation of certain areas of the state as Areas of Critical Environmental Concern (ACECs) is overseen by the Secretary of Environmental Affairs. ACECs can be established in both coastal and inland areas. The coastal segment of the program is administered by Massachusetts Coastal Zone Management (MCZM) and the inland segment by Massachusetts Department of Environmental Management (DEM). This program protects significant state surface water resource systems by ensuring that activities that impact them are carried out to minimize adverse effects. Currently, 18 ACECs exist in Massachusetts; 12 of the 18 are in coastal areas with many included in the Massachusetts Bays Program region.

Program Description

The coastal segment of the ACEC program provides the state with a mechanism to achieve, in part, the goals established by CZM, i.e., to protect and restore the quality of marine resources by developing solutions to current problems and managing the uses supported by the coastal zone. The ACEC program focuses on the preservation and protection of certain areas of the state that, because of the presence of significant natural features, require special attention. Activities within areas designated as ACECs must be designed and carried out to minimize adverse effects on:

- Marine productivity
- Habitat values
- Water quality
- Storm buffers

The ACEC designation recognizes the critical environmental and cultural importance of these areas and seeks to raise public awareness of the need for protection and alert federal, state and local regulatory agencies that activities in these areas must meet high environmental standards.

Areas can be nominated as ACECs by groups of citizens, local chief executives and local planning and conservation agencies. MCZM or DEM can recommend action on a nominated area. However, designation of an area as an ACEC is by the state Secretary of Environmental Affairs. Any area of the state may be designated as an ACEC. However, to become eligible, an area must contain at least four of the following features:

Fisheries habitat
Coastal features -- beaches or dunes
Estuarine wetlands
Inland wetlands
Inland surface waters
Water supply areas
Natural hazard areas
Agricultural areas
Historical/archaeological resources
Habitat resources
Special use areas

The Secretary uses several criteria in his/her decision to designate an ACEC including:

- Threat to public health from inappropriate use
- Quality of the area's natural characteristics, productivity, and uniqueness of the area

- Irreversibility of impact
- Imminence of threat to the resources
- Economic benefits

Because CZM and DEM do not have direct regulatory power over activities or land uses in ACECs, they must rely on federal, state and local permitting agencies for the implementation of ACEC policies. In coastal ACECs, CZM coordinates an interagency effort that may include:

State DEP and DEM
- Wetlands Division
- Waterways Division
- Division of Water Pollution Control
- Ocean Sanctuaries Program

Local
- Planning Boards
- Boards of Health
- Conservation Commissions

In addition, the Massachusetts Environmental Policy Act (MEPA) requires that all projects proposed in an ACEC that involve the use of state funds or require certain state permits must be described on an Environmental Notification Form or, if necessary, in an Environmental Impact Report. Also, federal agencies, such as the Army Corps of Engineers, must ensure that their activities are consistent with the CZM program.

The state's first ACEC--Parker River/Essex Bay--in Gloucester, Essex, Ipswich, Rowley, and Newbury was designated in 1979. The most recent area--Canoe River--in Easton, Foxborough, Mansfield, North Sharon, and Taunton was designated in 1991. The most recent coastal ACEC--Wellfleet Harbor--in Eastham, Truro, and Wellfleet was designated in 1989.

Applicability to Ongoing and Future Massachusetts Bays Program Efforts

During the ACEC program's 12-year history, an important criticism has been that the program is principally reactive and only responds to threats to an area's resources. The call for a more proactive approach was answered in the 1990 amendments to the Massachusetts Waterways Regulations, better known as Chapter 91. These amendments mandate, for the first time, the development of ACEC Resource Management Plans and establish a direct statutory mechanism to compel plan implementation.

According to 310 CMR 9.32:(e)4c, no private piers will receive Ch. 91 permits for construction unless they are consistent with an ACEC Resource Management Plan adopted by the municipality which has received approval from the Massachusetts Secretary of Environmental Affairs. This provision is seen as a method of encouraging the development of ACEC management plans for all twelve coastal designated ACECs and, the first step in requiring consistency between the plans and the regulatory programs designed to implement them. It should be pointed out that this is one of the few provisions in state statutes that requires consistency between planning and regulation.

Guidance for the development of resource management plans is currently in draft form and has not been

approved by the Secretary of Environmental Affairs. This draft guidance indicates that, should towns choose to develop plans, they must include an inventory and analysis of:

- Natural resources including: wildlife habitat, shellfish, salt marshes and ponds, wetlands, fish runs and water quality information
- Human uses including elements of the built environment and all sources of point and nonpoint pollution
- Land and water management plans and regulations and development bylaws with jurisdiction over areas included in the ACEC

ACEC Resource Management Plans may be written by the municipality or by a private group(s) authorized by the town. This flexibility allows significant citizen participation and a chance for those involved in the ACEC designation to influence ACEC management.

The Resource Management Plan initiative and the direct link established between the plan and state Waterways Regulations, represents significant authority to control development in ACECs and a proactive approach to ACEC management. Although the Chapter 91 amendments affect only the development of private piers, the requirement of consistency between ACEC plans and regulatory mechanisms could eventually be expanded to address more land use issues including those that directly affect water quality. Broadened consistency between ACEC plans and state and local regulatory programs could have an important impact on Massachusetts Bays Program goals. A link between the Mass Bays CCMP and locally adopted ACEC management plans may provide an important mechanism for the implementation of Massachusetts Bays Program goals.

Efforts to control land uses in ACECs are most effective when state agency review is required, primarily because developments that require only local permits do not trigger MEPA review. Consequently, there has been little opportunity for the ACEC program to address the cumulative impact of small scale development. However, there is opportunity to address the longer term impacts of development through increased coordination between MEPA and other state programs. Working in conjunction with the "antidegradation" provisions of the State Water Quality Standards, MEPA review can provide an important level of protection to coastal water quality.

Developments in ACECs which require state permits--such as water discharge permits--could be required to carry out a cumulative analysis of the project's impact on coastal water quality including consideration of existing pollution contributions. Proposed developments that increase pollutant levels above the antidegradation standards would not be permittable according to state policy. Through this type of interagency coordination, the ACEC designation can provide an effective extra level of review and control to protect coastal water quality.

The ACEC designation process also promotes Massachusetts Bays Program goals by raising public awareness of local environmental concerns. Campaigns for the designation of an area as an ACEC often involve substantial local participation, a process which can develop a strong sense of community "ownership" or "stewardship" over the area and sensitizes the public about the need for "special areas" protection of coastal resources. Most importantly, the public involvement of the ACEC designation process localizes the broader coastal resource concerns embodied in the Massachusetts Bays Program goals, and creates a mechanism for local action.

G. CAPE COD COMMISSION REGIONAL POLICY PLAN

Introduction

In early 1990, the Massachusetts state Legislature established and the voters of Cape Cod ratified a special act that created the Cape Cod Commission (CCC). The legislation established a regional land use agency (replacing the CCPEDC) with broad powers to protect the Cape's natural, cultural and social resources that were threatened by uncoordinated and inappropriate uses of the regions's land and water. The purpose of the CCC is to protect natural, coastal, scientific, historical, cultural, architectural and recreational values including:

- natural and undeveloped areas
- wildlife and flora
- endangered species habitat
- coastal resources including aquaculture
- water quality including groundwater, surface water and ocean water

The CCC has a principal role in the review and permitting of large developments, the designation and regulation of areas determined to be of critical importance and the development and implementation of a regional policy plan. This section focuses on the CCC's regional policy plan (the plan) and its applicability to coastal resources and the Massachusetts Bays Program.

In keeping with the mandate provided in the legislation, the CCC published a final draft of the regional policy plan (March 1991, one year after the agency's inception) and submitted it to the Barnstable County Assembly of Delegates (the county legislature) for approval. The plan was approved by the Delegates on July 31, 1991. On September 6, 1991, it became an ordinance of Barnstable County and provided the legal foundation for regulations promulgated by the CCC.

Plan Description

The legislation required that the plan identify the Cape's critical resources and provide a region-wide growth policy. The plan encompasses a wide range of issues including:

Land use/growth management
Natural resources
- Water resources
- Coastal resources
- Wetlands
- Wildlife and plant habitat

Affordable Housing
Historic preservation/community character
Economic development
Community Facilities/Services
- Transportation
- Solid and hazardous waste
- Capital facilities
- Energy

Open space and recreation

For each issue area, the plan contains goals and policies that provide planning guidelines for the region. The policies are organized into two categories: minimum performance standards and other development review policies. These are standards and criteria that developments of regional impact are expected to meet. Performance standards are mandatory and contain the word shall; developments of regional impact must meet these standards. The other development review policies are standards that the CCC seeks to

promote. The goals and policies also provide guidelines for local comprehensive plans, which may be prepared by the 15 towns of Barnstable County.

The coastal resources section of the regional policy plan establishes three broad goals:

- To protect the public interests in the coast and rights for fishing, fowling and navigation, to preserve and manage coastal areas so as to safeguard and perpetuate their biological, economic and aesthetic values, and to preserve and where appropriate expand public access to the shoreline.
- To limit development in high hazard areas in order to minimize the loss of life and structures and the environmental damage resulting from storms, natural disasters and sea level rise.
- To maintain and improve coastal water quality to allow shellfishing and/or swimming in all coastal waters as appropriate, and to protect coastal ecosystems which support shellfish and finfish habitat

In pursuit of those goals, any development determined to be a development of regional impact affecting coastal resources, may be required to meet the plan's minimum performance standards. These include:

- New development or redevelopment along the coastline shall not interfere with existing public access and traditional rights of way to and environmentally appropriate uses of the shoreline
- No new development, except for water dependent uses, shall be allowed within FEMA V flood zones. Existing structures may be reconstructed or renovated provided there is no increase in floor area or intensity of use
- No development or redevelopment shall be permitted on barrier beaches or coastal dunes as defined by the Wetlands Protection Act and associated regulations and policies. Existing structures may be reconstructed or renovated provided there is no increase in floor area or intensity of use. Water-dependent public recreational facilities in these locations may be developed providing that it can be demonstrated that the proposed development will not compromise the integrity of coastal resources.
- In order to accommodate possible sea level rise and increased storm intensity, ensure health and safety, and protect the integrity of coastal landforms and natural resources, all new buildings including replacements, within FEMA A and V flood zones shall be designed one vertical foot above existing FEMA base flood elevations and state building code construction standards
- Within flood hazard zones (FEMA A and V) new mounded septic systems shall be prohibited except to upgrade existing substandard septic systems where such systems pose a demonstrated threat to public health, water quality or natural resources.
- In order to accommodate a one foot relative rise in relative sea level, all new and replacement septic systems within FEMA A and V zones shall be designed with a minimum five foot separation to groundwater.
- No new direct, untreated stormwater discharges shall be permitted into any coastal waters or wetlands, including discharges above or below the mean high water level.
- In order to avoid loss of shellfish habitat and minimize impact on wetlands, construction or expansion of docks and piers, rather than separate structures serving individual lots, shall be required wherever possible. In significant shellfish habitat areas as identified by the Division of Marine Fisheries and/or local shellfish officials, the construction or

expansion of docks or piers shall not be permitted.

- New marinas of 10 or more slips, moorings or active landward storage berths, and expansions of existing marinas by 10 or more slips, moorings or berths shall provide or contribute to the provision of adequate boat sewage pump-out facilities in each harbor
- New dredging projects or expansion of existing dredging projects shall not occur unless a substantial benefit can be demonstrated including but not limited to enhancement of fish or shellfish habitat or necessary improvements to navigational safety.
- Undisturbed buffer areas of 100 foot width surrounding coastal wetlands and/or landward of the high water mark of coastal waterbodies shall be protected as specified in other sections of the plan

In Marine Water Recharge Areas--consisting of recharge areas to nitrogen sensitive embayments mapped by a method acceptable to the CCC:

- Development and redevelopment may be required to delineate the groundwater recharge areas to downgradient embayments and other marine waters that may be nitrogen sensitive in order to identify and mitigate potential adverse impacts
- Except as specified in the plan, development and redevelopment shall not exceed identified critical nitrate-nitrogen loading standards for nitrogen impact on marine ecosystems. Developments that generate more than 200 gallons per day of sewage effluent may be required to prepare a cumulative impact analysis, including flushing rate determination, using the methodology presented in the Buzzards Bay Management Plan

Applicability to Ongoing and Future Massachusetts Bays Program Efforts

The Cape Cod Commission and its regional policy plan represent an important mechanism to help implement Massachusetts Bays Program goals on Cape Cod. For the first time in Massachusetts, a regional planning Commission has the legal authority to compel compliance with its plan. For instance, using criteria established in the regional plan, the CCC can prohibit or impose strict performance standards on certain developments that may threaten coastal resources. As seen by the list of goals and performance standards (on the previous page) there is a clear connection between the objectives of the regional policy plan and the Massachusetts Bays Program. In fact, the plan in many ways provides a detailed and comprehensive strategy to implement Massachusetts Bays Program goals. A further step would be to incorporate aspects of the CCMP, if not covered by the plan, into the regional policy plan and, therefore, place the CCMP's objectives under the CCC's legal umbrella. This would provide a direct link between the CCMP and the CCC's powerful implementation tools.

The CCC and the regional policy plan also extend coastal resource protection powers to local regulators. The regional policy plan provides an outline for local comprehensive planning efforts. Although the CCC cannot compel towns to develop comprehensive plans, it provides several incentives for them to do so. If a town decides to plan, its plan must meet the approval of the CCC and be consistent with the regional policy plan. Furthermore, within two years, a town's land use and development bylaws must be amended to be consistent with their local plan. This ensures that all developments subject to local review, not just those that trip regional thresholds for review, will be judged according to regionally approved standards.

The CCC's growing database of coastal resources and marine waters may also be valuable to the Massachusetts Bays Program.

H. CAPE COD AQUIFER MANAGEMENT PROJECT

Introduction

The Cape Cod Aquifer Management Project (CCAMP) was a three-year water quality planning project initiated in 1985. The purpose of the project, motivated by the extreme vulnerability of the Cape's sole source aquifer, was to examine the effectiveness of the way in which the region's groundwater resources were being protected. It was a uniquely cooperative effort among various government agencies: U.S. EPA Region 1, Massachusetts Department of Environmental Quality Engineering (DEQE), CCPEDC, The U.S. Geological Survey (USGS) and local government agencies in Barnstable and Eastham.

Program Description

CCAMP had a clear focus on groundwater quality and the management of groundwater resources. The project selected the towns of Barnstable and Eastham to test four suppositions:

- Prevention, not correction, is the proper groundwater management approach
- The present institutional arrangement for protecting groundwater is ineffective due to a fragmented regulatory process
- A comprehensive resource-based approach to groundwater management, rather than individual source-by-source controls, is the preferred method
- Greater knowledge and improved data is required at the local level for land use decision making

The theme of the project was that current groundwater protection programs at the federal, state and local levels are media-specific and focus on individual sources of pollution without an awareness of the cumulative effect of the multitude of potential contamination sources. Furthermore, groundwater protection programs are typically carried out without a thorough understanding of the resource that required protection. CCAMP set out to address both of these issues. It sought to establish new institutional arrangements among levels of government and implement a resource-based approach to groundwater protection. Underlying the resource- based approach was an attempt to develop a proactive, prevention-oriented plan for groundwater management. It featured the following components:

- Thorough characterization of the aquifer system so that the zones of contribution to the public supply wells can be delineated as accurately as possible
- A comprehensive inventory of all potential sources of contamination located within the Zone of Contribution (ZOC)
- Assessment of the federal, state and local controls in place for the regulation of all sources
- A strategy for protecting groundwater based upon relative risk from individual sources, cumulative impacts from several sources, and possible future problems from potential sources

Much of the project's effort was directed toward the technical aspects of groundwater resource characterization. CCAMP produced detailed maps using Geographic Information Systems (GIS) technology, that portrayed each town's zone II, zones of contribution to public water supply wells. This technical information was integrated with comprehensive land use inventories that identified all existing

and potential sources of contamination in those ZOCs. By characterizing land uses and potential risks, it was then possible to evaluate the effectiveness of existing management programs and to design comprehensive strategies directed to all levels of regulatory agencies based on detailed site specific information.

CCAMP's hydrogeological and land use analyses and management recommendations were completed for Barnstable and Eastham. However, the process and institutional arrangements developed were meant to be a template for groundwater resource planning and protection for the entire Cape.

CCAMP made comprehensive, detailed recommendations to federal, state, regional, and local agencies involved in groundwater protection policy or agencies with jurisdiction over land uses that could affect water quality. Recommendations covered a wide range of topics including:

Water supply planning	Landfills
Private wells	Underground storage tanks
Septage and sludge	Septic systems
Construction grants	Groundwater discharge permits
Groundwater classification	Toxic and hazardous materials
Pesticides	

The project recommendations clearly promoted an interdisciplinary approach to these issues, focusing particularly on strengthening local regulatory programs in conjunction with developing regional solutions to resource protection. CCAMP expressed strong support for 1988 state legislation proposing the creation of a regional land use agency with planning and regulatory power to manage land uses and, as a consequence, protect groundwater. Many of CCAMP's recommendations are currently being implemented by the Cape Cod Commission, the regional agency established by that legislation. (See Section G of this chapter.)

Applicability to Ongoing and Future Massachusetts Bays Program Efforts

Because CCAMP focused exclusively on the protection of groundwater resources, its direct applicability to the Massachusetts Bays Program is limited. However, many of the techniques proposed by CCAMP to reduce the impact of land uses on groundwater may be useful to decrease the contamination of coastal resources caused by polluted groundwater. For example, the town of Falmouth's nutrient loading bylaw (adopted prior to CCAMP) utilizes techniques similar to CCAMP to identify and protect certain coastal embayments from land-based contamination transported to the coast by groundwater.

CCAMP's methodology -- the resource-based approach -- may also have important implications for the Massachusetts Bays Program. The comprehensive approach which included: 1) a thorough resource characterization; 2) a land use inventory of existing and potential contamination risks; 3) an assessment of existing regulatory controls; and 4) the development of a comprehensive management strategy, was widely accepted as a model for resource protection.

CCAMP was perceived as successful because it demonstrated:

- The importance of a resource-based approach to groundwater protection
- The effectiveness of administrative and scientific personnel from each level of

government working together in a cooperative process

- The value of developing creative management tools to insure informed decision making
- The need to transfer technical information in a usable form, from federal and state agencies to local groundwater protection managers.

CCAMP broke new ground in the development of innovative, interdisciplinary arrangements among the various levels of government. It pointed out the importance of establishing partnerships among regulatory agencies and the need to integrate management and data collection/analysis activities. It identified the GIS system as an important link between data analysis and the development of a management strategy. The importance of coordination was made more important in the absence of federal policy guidance and the lack of comprehensive regulatory programs at the federal or state level. Because coastal resources share a similar lack of regulatory guidance, the Massachusetts Bays Program will need to foster the same interagency cooperation from the outset.

CHAPTER 4. CONCLUSION

This review study provides background information on water quality planning programs which have occurred or are ongoing in Eastern Massachusetts. The primary purpose for conducting such a review is to enable the Massachusetts Bays Program to meet its goals of preserving and enhancing the marine resources within the Bays area in a coordinated and efficient manner. There is a full array of public agencies at all levels which are conducting or have conducted water quality planning activities. The Massachusetts Bays Program needed to understand the general content and findings of past plans, the process by which they were developed, the evolution of water resource planning, opportunities for coordination such as the sharing of data and funding, as well as what worked and what did not. The Massachusetts Bays Program should benefit from and build upon past efforts. The Comprehensive Conservation and Management Plan (CCMP) must have optimum opportunity for acceptance and implementation by all levels of government.

Therefore, this section extrapolates the lessons learned from prior planning efforts based upon interviews with those who were involved and an analysis of the final plans as adopted.

A. THE PLANNING PROCESS

To accomplish any objective, one must have a plan of attack, at least in a generic sense. Thus, it is necessary to have a clear understanding of what a plan is and what the CCMP can reasonably provide. The definition of the term "plan", as found in The Practice of State and Regional Planning (written and edited by the American Planning Association and published in cooperation with the International City Management Association), is:

> "A plan is a predetermined course of action ... its purpose will be to affect the future in a positive way ... The idea is to learn more about current problems and future prospects before deciding on a course of action toward the future. By this means, the decision becomes more rational, more objective, and fully informed; it relies less on intuition and more on facts ..."

All of the plans reviewed in this report had goals, collected data, defined problems, and recommended a course of action, all of which are essential components of the planning process. However, frequently essential steps were missing. The planning process as defined by Preston P. LeBreton and Dale A. Henning, in their book Planning Theory (Prentice-Hall, 1961), includes:

1. Problem identification (awareness of need)
2. Goal setting
3. Data collection
4. Refinement of goals (based on research and awareness of financial, political, and technical parameters)
5. Development of alternative policies and/or plans (options)
6. Evaluation of alternatives (impact analysis)
7. Adoption of preferred policies or plans
8. Implementation
9. Monitoring and evaluation of results
10. Feedback (recycle the planning process as needed to meet emerging circumstances)

Often the programs and plans reviewed in this report lacked one or more of the above components. For instance, frequently, a plan did extensive problem identification and data collection but failed to spell out alternatives, and skipped directly to the proposed solutions. The public did not feel that they understood why this was the recommended course of action, and, therefore, did not implement it. Implementation is frequently forgotten as being a part of the planning process. People think the process stops with the "plan document" or recommended course of action. If the plan does not clearly spell out how recommendations are to be implemented, by whom and when, then it may well fail. Even when actions necessary to implement the plan do occur, there needs to be monitoring of those actions and follow-up evaluation to determine if those actions are having the desired impact or whether other actions could be more effective. Very little monitoring has occurred outside of the 303(e) process. It was difficult for the writers of this report to determine if planning implementation had occurred, if actions which did occur were a direct result of a planning document, and if those actions undertaken validated the preferred recommendations of the plan. Even when plans were implemented, actions taken were not often publicly accredited as resulting from a plan, so the planning process was not necessarily being validated in the eyes of the general public.

B. THE PLANNING CONTEXT

The Practice of State and Regional Planning also discussed the seven dimensions or context of the planning process:

1. Organizational location (or clientele)
2. Purpose
3. Openness
4. Time horizon
5. Scope
6. Specificity
7. Flexibility

Although the authors go on at some length to define these dimensions in general terms, the writers of this report will utilize them to discuss the pitfalls to be avoided and the lessons learned with the water quality planning efforts reviewed in this report.

Organizational Location or Clientele

This dimension raises several issues. To begin with, it usually was the case that the federal or state government initiated the water quality planning process either through their agency or a private consultant. However, the actions needed to implement the plan often fell to local government. Local government was the recipient of a lot of good advice that they may have never really asked for. Therefore, there was little interest expressed in implementing this unsolicited advice.

An even more common issue occurred when Congress mandated that the planning occur. Congress was the client, but the organization that had to carry out the planning process may not have seen the need for a plan. The plan had to be done, but there was no commitment on the part of the "client" to utilize their authority to implement that plan, unless there was a mandate or financial assistance. This was especially true when the function of planning was required by Congress to be done by an entity other than the

funding agency. For example, DEP was much quicker to follow up on the 303(e) basin plans produced by their own staff than they were the 208 studies produced by the RPAs. Agency loyalty prefers to see the money kept in-house, since they have more knowledge of the qualifications of those producing the plan and more control over the content of the plan. This problem can come full circle, however, in that the more one controls the planning process, the less opportunity there is for outside participation and support.

Planning clients may sometimes use a "plan" as a substitute for action or funding they may not be ready to undertake. They do not want to perform a needed action, so they say they need a plan to be certain if it is necessary and how it should be done. They are only buying time or hoping that they can raise enough issues during the process to obfuscate the problem, and that eventually advocates for that idea will give up or go away.

Another component of this dimension occurs when the plan is produced but is not tied to the organization or entity that has the ultimate authority to implement it. In the first instance above, the client passes implementation off to another who may or may not have any interest in implementing the plan. In this instance, the client may sincerely want to implement the plan, but lacks the legal authority to do so. In this instance, getting a "buy-in" from others very early on in the process is essential. The Massachusetts Bays Program will need locally-elected officials extensively to implement the CCMP. They must be brought into the process quickly and in a meaningful way so as to be equal partners in the production of the CCMP.

Purpose

Every plan ultimately has as its purpose to implement change so as to achieve a goal or rectify a problem. There will always be those who want to try to protect the status quo. Local government may want to avoid the cost or political problems associated with implementing plans. Private property owners may want to protect the development potential and profitability of their property. And governmental agencies may want to protect their "power" to make decisions, be it funding, density, locational, etc., without oversight from above or delegation to another entity below.

The purpose of the plan, i.e., the remedying of a major problem shared by all, must be clearly spelled out. Unless people see themselves directly sharing in that problem (e.g., loss of quality drinking water) and benefiting from its solution, implementation will not occur voluntarily. For example: "I may not want to clean the water for those downstream if I lose my job or income in the process".

It is more difficult to explain the purpose of the plan when it is preventive in nature, such as, preserving water quality, than it is when it is reactionary in nature, i.e., correcting contaminated water supplies. For instance, residents on the Cape, after learning about sole source aquifers and existing pollution problems, were quick to apply pressure to have plans developed to prevent similar pollution problems from occurring again. This resulted in the expansion of the Cape's regional planning agency into a regulatory commission with implementation powers.

Since the Massachusetts Bays Program program will necessitate local actions, it will be necessary to prove that the problem is local and that there will be local benefits if there is to be local implementation.

Openness

We will use this dimension to discuss the problem of citizen participation. Starting with SENE over 15 years ago, good water quality plans were repeatedly produced. While recommended structural solutions may have occurred, the land use and environmental recommendations sometimes did not. Why, then, were some not implemented? One of the major reasons was lack of broad public support and understanding for these recommendations. People were either unaware that a plan had been produced, or were opposed (possibly indifferent) to specific recommendations. The Massachusetts Bays Program will need to involve a broad range of citizens and the media in its work and make the work meaningful to both.

The role of local officials and the general public cannot be overstated, if they are the ones to ultimately implement the plan through passage of regulations or raising implementation funds. If the state and federal government have the authority to implement the plan or intend to provide extensive financial incentives, then citizen leadership is helpful but not essential. Problems that will need to be overcome in order to get public involvement include:

- Distrust -- A skepticism on the part of citizens that "government" wants to hear their opinion versus using them as a "rubber stamp"

- Motivation -- Getting people to see why this is as important to them as other items in their daily lives

- Defensive position -- Those most likely to get involved will do so to protect their interests, e.g., business, land value, local control, agency jurisdiction

- Lopsided participation -- If one sector of citizens predominates the membership of a committee or public meetings, then a perception is given that the project is a front for their policy positions

- Structuring useful involvement -- Meetings that do not impart information appear to be a waste of time, yet too much information gives the impression the program is off and running without their input

- Too complicated -- Information on marine toxicology, pollutant pathways, etc. can be overwhelming for general citizens. Also, the bureaucracy of laws, regulations, and agencies in charge is confusing (possibly deliberately)

- Bureaucratic-- A CAC is often a committee of participating public agencies and interested groups from all levels, rather than general citizens representing shorefront homeowners, fishermen, developers, hospitality industry, boatyard owners, etc.

- Leadership -- Even when well informed and in agreement with the plan's recommendations, participants return to their personal lives upon plan document completion, as opposed to following through to achieve its implementation.

It should be emphasized that public support is based on immediately understandable issues and solutions, broad media coverage, and credible advocates. Creation of committees, convening of meetings, body counts of participants, and even endorsements by public officials should not be automatically perceived as qualitative measures of public understanding and support.

Time Horizon

Planning is a statement about the future, but how far out can one predict the future and still have it accurate and meaningful for government leaders and general citizens? The SENE Study was a 50-year plan. Such a long-range perspective does not provide any sense of immediacy. No one was assigned specific actions or any timeline, so people waited for someone else to do it. However, short-term plans are usually too focused on one imminent problem to be integrated and address problems that have multiple causes, such as sources and remedies for current and future marine pollution. A combination of comprehensive and strategic planning is needed. The comprehensive plan should not address more than 15-20 years, and the assumptions made to produce the plan must build from a foundation that is reflective of current financial and political realities in order to be credible with the public. Thus, the plan will be more general in nature, but it cannot stop there. More specific recommendations will need to be developed for each issue. These will address the specific implementation steps needed for each general recommendation and may be undertaken in a very short time frame.

Scope

The Massachusetts Bays Program covers a very broad area from Salisbury to Provincetown. It will be difficult to have the citizens of Salisbury truly care about occurrences on the Cape. Yet the interrelationships of ocean currents and pollutant flows have been documented. Scientists need to look at this broad geographic area, but localize the issues to maintain local interest.

Also, the diverse forms of pollutants (toxics, urban runoff, atmospheric deposition, point versus nonpoint) necessitate a very broad scope of study. The Massachusetts Bays Program runs the risk of seeming unfocused to the citizen. Everything cannot be a top priority. However, when priorities are set, documentation is needed to explain those decisions. If people think "their" issue is not going to be covered or not covered in depth, they will lose interest.

The broad diversity of issues will also necessitate a broad list of recommendations to local government. Too many issues being thrown at them at once, most of them also controversial, will result in withdrawal. Local government does not have the money or the staffing capacity to deal with multiple, controversial issues and still continue to perform daily government functions, especially when their own fiscal problems must take precedence.

Two steps are, therefore, needed to help implementation to occur. First, the complex set of issues must be packaged in a concise, easy-to-follow format so as not to be overwhelming. Second, there needs to be follow-through with local government to help them initiate the implementation process. Instances where 208 plans were followed up with smaller implementation grants showed the most success. Intermunicipal agreements for septic sludge removal were ironed out and land use regulations were enacted, but it required funding to provide technical assistance at the local level. These capacity building grants could go to regional planning agencies, to local government to hire new staff, or to consultants to provide specialty expertise. How it is done can be negotiated later, but that this local capacity is

needed is unquestionable.

Specificity

This was an issue with some of the more comprehensive plans. Criticism was made about the lack of detail to justify specific decisions or guide implementation. This led one state official to draw the distinction between horizontal and vertical policies. Policies such as "wetlands need to be protected" and "barrier beaches should not be built upon" are true, no matter what community you are dealing with. They are so broad that they are really goals. However, to implement those policies locally requires more specific detail, e.g., where are these lands, who owns them, how are they presently zoned, what regulatory amendments stand a chance of passage. Comprehensive plans cannot always be expected to provide this degree of detail, but follow-up project planning must get down to this level.

Flexibility

Since a plan sets the course for future actions, it is often ahead of its time. For instance, the 208 plans emphasized nonpoint pollution problems and nonstructural solutions, while funding agencies were still focused on point sources and structural solutions. Eventually, when facilities were on-line, but pollution problems continued, attention had to turn to nonpoint sources and nonstructural actions. It should be noted that Table II-5 (providing status of SENE recommendations) indicates that many of these 16-year-old recommendations are just now being implemented. The plan was technically correct about what was needed to remedy the pollution problems, but the cost of the solutions or the intermunicipal cooperation required and other factors prevented the plan from being implemented in a timely manner. Being cognizant of the context in which you are planning is almost as important as scientific accuracy.

The plan places the problem in its full context and should establish reasonable expectations about how the problem can be remedied. It needs to be "technically pragmatic" which means that it must be accurate, but also reflect the times in which it is being written. It must consider the economy, the political realities of trying to implement it, and the willingness of the voters to trust its recommendations and act to implement them. But it must also be visionary so that necessary long-term objectives are not ignored.

Also in the vein of being flexible, there arise two additional policy considerations. First, which is the best approach to planning work -- a centralized or decentralized approach. A central approach has one group in one location do the work for the entire geographic area within the study. A decentralized approach has sub-areas of the study area do the work. There are advantages and disadvantages under both systems. The centralized technique usually requires fewer people, provides a consistent content and style, and enables cooperation to occur more easily. The decentralized approach is closer to the issue being studied and, therefore, allows for better citizen input, more local context relative to implementation problems, potentially more local ownership, and more opportunities for implementation through nearby technical assistance and follow-up. Both techniques have been used in the programs reviewed. SENE and 303(e) efforts were centralized, statewide planning reports, while 208 and 205(j) have been decentralized efforts. The availability of follow-up funding seems to have had more of an impact on plan implementation than the method of conducting the plan. The Massachusetts Bays Program will have to judge the pros and cons of each approach as it prepares requests for proposals and awards contracts.

The second policy consideration relates to plan implementation -- the dilemma of whether to target

priority areas for funding or to allow implementation to occur on a more random basis generated by local interest. A major reason for targeting is that enough activity occurs in a small area to establish visible impacts, in turn establishing credibility for the project. Even when only a small amount of implementation funding is available, a small target area could implement several recommendations in order to test their collective impact on the pollution problems, e.g., opening a previously-closed shellfish bed.

On the other hand, targeting can have its drawbacks. First, those who will not get funds will try to exert political influence to scuttle the targeted approach and may even generally oppose the plan. The Massachusetts Bays Program does not need this type of problem. Second, every community in the target area would need to be similarly motivated to participate in order to achieve the collective impact desired. This seldom happens. Truly motivated funding applicants will spring up randomly throughout the study area. Locally-motivated applicants usually achieve more than those who are hand-selected by a higher authority to participate. However, random grant awards will not achieve the same visible impacts and validation of the plan. This issue may be settled by the federal government as it comes down more on the side of targeting. EPA is requiring states to prioritize their wetlands and nonpoint sources for pollution prevention funding. If this trend continues, the Massachusetts Bays Program will have to address the political difficulties of targeting grant areas, but will also benefit by testing its recommendations on a micro scale.

C. FINDINGS

Based on the above analysis of the dimensions of a planning process, the following specific findings are being made to the Massachusetts Bays Program as they develop their CCMP. The reader is also encouraged to reread the "Program Evaluation" components of both the 208 and SENE write-ups and the "Applicability to Ongoing and Future Massachusetts Bays Program" components of the programs found in Chapter III.

- Prove the problem is local to get local implementation of recommendations.
- Structure local involvement so as to have chief elected officials and other local board members actively involved as equal partners.
- Structure general public involvement so that it is representative of all coastal interests (economic as well as environmental) and develops long-term leadership that will strive to implement the plan.
- Ensure that all public agencies involved with producing the plan are committed to its implementation.
- Do not separate the plan from those who will eventually be responsible for funding implementation. Implementors will not be committed to a plan in which they have not participated.
- Develop the plan within the context of economic and political realities.
- Link funding incentives to the plan so that recommendations can be implemented immediately thereafter, thereby gaining momentum.
- Do not permit public funding of activities which are contrary to the plan.
- Provide funding for technical assistance and capacity building to ensure implementation. Locally-based agencies, such as regional planning agencies, are well suited for this type of follow-up work.
- Strive to keep the project visible and credible by funding demonstrations on an ongoing

basis and promoting the improvements they accomplish.

- Simplify the state's structure for implementing water quality. Presently, it is very confusing for local officials and the general public to understand what programs exist and who administers them. When you build a house, you assemble all the tools on site. You do not go to one store for the hammer, another for the nails, and another for the lumber; but we expect people to know when to utilize the CZM Office, DEM, DWPC, MEPA, Waterways, etc. to achieve their water quality goals.
- Improve coordination among state agencies that administer water quality programs. Frequently, chief policy staff understood programmatic interrelationships, but line staff and program heads who administered the programs were not well acquainted with the Massachusetts Bays Program or other similar water quality planning efforts.
- Ensure that there is an organizational structure in place at the end of the planning process to implement the plan, especially the inter-local recommendations.
- Maximize the use of existing agencies and resources before looking to new authorities.
- Address the issue of such a broad geographic area being needed for technical accuracy, versus loss of local ownership, by targeting funding to sub-areas that generate local or regional identities/loyalties.
- Follow up generic recommendations with strategic plans that help communities understand the specific actions they need to take to implement marine water quality improvements.
- Develop a concise, easy-to-read document that clearly spells out who should be doing what, when, and how. Avoid overwhelming the public with too many recommendations and too much detail.
- Emphasize land use planning as a preventive approach versus more costly structural solutions that are more a reaction to pollution.

This report's findings may appear self-evident, but in fact are very difficult to accomplish. It is difficult to maintain visibility and keep the public's interest over a five-year period. Public agency staff and local elected officials will change, necessitating re-orientation sessions; and, certainly, maintaining the funding levels to develop local capacity and implement small-scale projects will be a problem. Yet on the basis of the reviews summarized in this report, it is evident that these are essential ingredients to successful planning. The CCMP will place marine quality issues in context and explain their interrelationships. It will then fall to local government, regional planning agencies, citizen advocates and environmental organizations to develop more specific strategies and implement them. It will fall to the federal and state governments to help finance these implementation efforts. The cooperative effort being structured now through the Management Committee will need to continue long after the initial five-year planning period in order to achieve the shared goal of improving and enhancing marine resources.

Massachusetts Bays Program should take encouragement from the fact that a good number of the recommendations in previous plans were eventually implemented over a number of years due to their logic and technical correctness. This sometimes happened even when follow-through was minimal and implementation circumstances were not yet ripe. It should also be remembered that not all problems can be addressed early and resolved quickly. Indeed, many fundamental environmental issues will require a long-term horizon for resolution.

This review has provided a retrospective on the progressive evolution of water quality planning activities in Eastern Massachusetts. The Massachusetts Bays Program can build upon and benefit greatly from these earlier and current works. The report has found that a combination of factors contribute to the

success of planning and implementation activities. There is no simple formula for success. The mix of factors and their relative weight must be individually arranged for each unique project. Strong state or federal funding or regulation can secure successful follow-through on a plan. Absent such force, it is critical that the problems and solutions be made directly relevant and immediate to local government and the general public. However, in doing so, a plan should not sublimate its vision. This presents somewhat of a dilemma -- specificity is necessary for tangible short-term benefits, but comprehensiveness is needed for long-term impact and pollution prevention. This is a problem for many comprehensive plans. But, as U.S. EPA Administrator William K. Reilly has noted:

> "For 20 years we have established goals on a pollutant-by-pollutant and medium-by- medium basis without adequately considering broader environmental quality objectives ... We have seldom if ever been directed by law to seek out the best opportunities to reduce environmental risks, in toto, or to employ the most efficient, cost-effective procedures."

The Massachusetts Bays Program is the type of comprehensive program that can make major strides toward those broad environmental quality objectives.

APPENDIX A

MASSACHUSETTS BAYS REGION SENE STUDY RECOMMENDATIONS

RECOMMENDATIONS

GUIDING GROWTH (Chapter 3)

1. Protect priority Critical Environmental Areas.
2. Restrict development on other Critical Environmental Areas.
3. Manage growth on Developable Areas.
4. Use SENE resource development capability analysis to guide future growth.
5. Accommodate growth where services already exist.

WATER SUPPLY (Chapter 4)

1. Institute water conservation practices in all municipalities.
2. Continue to use ground water in Wenham.
3. Develop additional ground water in six northern municipalities.
4. Regulate land use in recharge areas of planning area municipalities.
5. Revise and enforce septic tank regulations.
6. Use zoning regulations to restrict use on recharge lands.
7. Consider development of recharge structures in four municipalities.
8. Use existing surface water supplies in Lynn and North Andover.
9. Use existing ground and surface water in Manchester and Newburyport.
10. Continue transfer of water from Newburyport to Newbury.
11. Continue to supply seven municipalities with MDC sources.
12. Construct Reservoir 30-B to supply water to eight municipalities.
13. Rely on Lynnfield reservoir to supply 1990 needs of six municipalities.
14. Consider forming a regional water management agency.

WATER QUALITY (Chapter 5)

1. Carry out current state non-degradation policies in the planning area.
2. Attenuate runoff from new developments in at least eight planning area municipalities.
3. Study and define the landfill leachate problem.
4. Begin stormwater and wet-weather stream sampling in urbanized municipalities.
5. Provide pump-out facilities and treatment for watercraft wastes in coastal communities.
6. Form a regional sewer district of North Reading, Wilmington, Lynnfield, West Peabody and Middleton.
7. Construct an advanced watewater treatment facility in Hamilton after 1990.
8. Construct a secondary treatment facility in Lynn.
9. Provide secondary treatment for South Essex Sewer District.
10. Provide secondary treatment in Gloucester, Rockport, Swampscott, and Ipswich.
11. Construct an advanced wastewater treatment facility with ocean discharge in Essex.
12. Upgrade Newburyport treatment plant to secondary with discharge to the Merrimack River estuary.
13. Serve Groveland by Haverhill treatment facility.
14. Continue to serve North Andover by Greater Lawrence Sewer District.
15. Continue Metropolitan Sewer District service in Winthrop, Reading, Revere, and Wakefield.
16. Maintain existing secondary treatment facility in Manchester.

OUTDOOR RECREATION (Chapter 6)

Swimming

1. Secure public access to the shoreline.
2. Continue to investigate best methods to widen and protect Revere Beach.
3. Expand or improve public transportation to North Shore beaches.
4. Acquire Phillips Beach (in Swampscott) and West Beaches (in Beverly) for local use.

Boating

5. Encourage orderly boating growth in at least 5 municipalities.
6. Guide future development in at least 15 marinas.
7. Maintain channels, if justified by favorable economic and environmental benefits.

General Outdoor Recreation

8. Develop guidelines for low intensity recreation on storage water supply reservoir lands.
9. Designate the Ipswich River a component of scenic rivers system.
10. Acquire and develop 1000 acres near Ravenswood Park.
11. Develop trails and picnicking facilities in Lynn Woods.
12. Expand the Harold Parker State Forest.
13. Expand Breakheart Reservation.
14. Acquire islands along the North Shore coast.
15. Use SENE Development Capabilities Maps for open space and greenbelt programs.

Wildlife and Fresh Water Fisheries

16. Use Natural Resources Planning Program to enforce wetlands legislation.
17. Use Self-Help funds to acquire significant wetlands.
18. Change Great Ponds legislation for fishing ponds.
19. Acquire public access to 41 ponds.
20. Acquire public access to 15 streams.

MARINE MANAGEMENT (Chapter 7)

Offshore Fisheries

1. Continue to support an interim offshore 200-mile economic zone.
2. Support national fisheries management policy.
3. Improve market for underutilized fish species.
4. Accommodate coastal fish facilities through improved planning.
5. Allow privately financed purchase of foreign-built fishing boats.

Shellfish and Aquaculture

6. Increase state's technical assistance for local shellfish management.
7. Fund State to assist towns having aquacultural potential.
8. Give priority to new treatment plants with deep-ocean outfalls.
9. Research removal of virus and bacteria from wastewater to reduce shellfish health hazards.

Commercial Navigation

10. Conform with regional port development study findings.
11. Consider deepening Gloucester channel.

Urban Waterfronts

12. Coordinate local waterfront planning and development.
13. Provide guidance and set criteria at the state level for priority waterfront uses.
14. Review and coordinate waterfront use.
15. Provide federal funding for state and local waterfront development plans.

FLOODING AND EROSION (Chapter 8)

1. Develop flood plain management programs which maximize non-structural solutions.
2. Undertake a comprehensive flood plain management study of the Ipswich River.
3. Adopt local flood plain zoning preventing adverse flood plain development.
4. Establish local sediment and erosion control ordinances.
5. Establish forest buffer zones.
6. Establish local regulations to strengthen flood plain management.
7. Acquire significant flood plains and wetlands.
8. Investigate a diversion channel in Wilmington.
9. Locate in existing safe buildings in the flood plain.
10. Encourage natural stabilization of coastal erosion areas.

LOCATING KEY FACILITIES (Chapter 9)

1. Reconsider the Lynnway site for a power plant.
2. Consider regional implications of petroleum facility siting policy.
3. Develop better terminal information on petroleum facilities siting.

RECOMMENDATIONS

GUIDING GROWTH (Chapter 3)

1. Protect priority Critical Environmental Areas.
2. Restrict development on other Critical Environmental Areas.
3. Manage growth on Developable Areas.
4. Use SENE resource development capability analysis to guide future growth.
5. Accommodate growth where services already exist.

WATER SUPPLY (Chapter 4)

1. Expand MDC sources by completing the Northfield Mountain Facility and carrying out conservation measures; plan the Millers River Facility.
2. Protect ground water sources in Everett and Woburn.
3. Extend MDC service to supplement sources in Wellesley, Natick, and Dedham.
4. Expand the capacity of Echo Lake to serve Milford.
5. Develop ground water sources to serve Franklin, Medway, and Wrentham.
6. Develop ground water supplies in other Upper Charles municipalities.
7. Maintain and upgrade ground water sources in Canton and Norwood.
8. Develop ground water sources in Sharon to meet 1990 needs.
9. Develop Willett Pond in Walpole for supplementary supplies.
10. Extend MDC service to Westwood and Stoughton.
11. Expand the Richardi Reservoir to serve Braintree, Holbrook, and Randolph.
12. Treat existing standby wells in Weymouth to meet 1990 needs.
13. Make best use of local resources in south coastal municipalities.

WATER QUALITY (Chapter 5)

1. Carry out current Massachusetts non-degradation policies.
2. Attenuate runoff from new urban developments.
3. Begin stormwater and wet-weather stream sampling.
4. Continue current industrial permits program.
5. Give additional consideration to several land disposal sites.
6. Connect southern Bellingham to the Woonsocket treatment facility.
7. Expand Medfield's treatment facility to serve Millis, if possible.
8. Construct advanced facility in the middle Charles basin to serve western suburbs.
9. Construct advanced facility in Canton to serve southern suburbs.
10. Study and define the landfill leachate problem.
11. Provide pump-out facilities for watercraft wastes.

OUTDOOR RECREATION (Chapter 6)

Swimming

1. Study best method to widen and protect Nantasket Beach.
2. Improve access along the Dorchester waterfront.
3. Improve facilities at Wollaston Beach, Merrymount Park, and Blacks Creek marsh.
4. Construct one bathhouse at City Point-Carson Beach area.
5. Provide parking and access to Moswetusset Hummock.

Recreational Boating

6. Establish state boating advisory committee.
7. Consider fore-and-aft mooring practices.
8. Continue maintenance of 13 recreation channels.
9. Develop boat ramps and parking facilities.

General Outdoor Recreation

10. Complete developing Boston Harbor Islands Park.
11. Improve inner-city recreation opportunities.
12. Designate the Charles an initial component of scenic rivers system.
13. Expand the Mystic River Reservation.
14. Develop a park behind the Amelia Earhart Dam in Somerville and Everett.
15. Acquire parts of the surplused Chelsea Naval Hospital.
16. Develop Middlesex Fells Reservation and expand Blue Hills Reservation.

17. Expand Wompatuck State Park.
18. Expand Rocky Woods, Noon Hill, and Hale Reservations.
19. Develop Hallet Street Dump for recreation.
20. Connect Neponset River Reservation and Blue Hills Reservation with a stub of land near I-95.
21. Acquire access to Massapoag Lake.
22. Develop guidelines for low-intensity outdoor recreation on secondary reservoir lands.
23. Use Critical Environmental Areas identified on SENE Development Capabilities Map (Plate 1).

Wildlife and Fisheries

24. Use Natural Resources Planning Program to enforce wetlands protection legislation.
25. Use Self-Help Funds to acquire significant wetlands.
26. Acquire public access to potentially most productive streams.
27. Change Great Ponds legislation and acquire access to potentially most productive ponds.

MARINE MANAGEMENT (Chapter 7)

Port Development

1. Develop a regionwide port development strategy.
2. Maintain nine channels in Boston Harbor.
3. Consider deepening two channels in Boston Harbor.
4. Attract private investments to the Port of Boston.
5. Improve Fort Point Channel.
6. Relocate work boats upstream of Northern Avenue Bridge to Pier 7.
7. Consider a new marina between Northern Avenue and Congress Street.

Commercial Fishing

8. Study upgrading Boston Fish Pier.
9. Consider developing a new fish pier in Boston Harbor.
10. Continue to support an interim 200-mile offshore economic zone.
11. Support national fisheries management policy.
12. Improve market for underutilized fish species.
13. Accommodate coastal fish facilities through improved planning.
14. Allow privately financed purchase of foreign-built fishing vessels.

Urban Waterfronts

15. Coordinate local waterfront planning and development.
16. Provide guidance and set criteria for priority waterfront uses.
17. Review and coordinate waterfront use.
18. Support state and local waterfront development plans.

Offshore Sand and Gravel

19. Develop a policy and program regulating commercial mineral extraction in coastal waters.
20. Coordinate future leasing of far-shore sand and gravel sites.
21. Develop predictive modeling techniques for offshore sand and gravel operations.

FLOODING AND EROSION (Chapter 8)

1. Develop a flood plain management program for the Neponset Watershed.
2. Apply structural solutions selectively.
3. Study flooding problems in Braintree.
4. Adopt flood plain zoning preventing adverse flood plain development.
5. Establish local sediment and erosion control ordinances.
6. Establish forest buffer zones.
7. Establish local regulations to ensure flood plain protection.
8. Acquire significant wetlands and flood plains.
9. Locate in existing safe buildings in the flood plain.
10. Encourage natural stabilization of coastal erosion areas.

LOCATING KEY FACILITIES (Chapter 9)

1. Study deepwater port facility off Metropolitan Boston within a New England-wide context.

RECOMMENDATIONS

GUIDING GROWTH (Chapter 3)

1. Protect priority Critical Environmental Areas.
2. Restrict development on other Critical Environmental Areas.
3. Manage growth on Developable Areas.
4. Use SENE resource development capability analysis to guide future growth.
5. Accommodate growth where services already exist.

WATER SUPPLY (Chapter 4)

1. Protect existing supplies and encourage water conservation measures.
2. Develop additional ground water sources to serve Rockland.
3. Form a South Shore water district or board.
4. Develop and protect ground water in six municipalities.
5. Treat existing well sources in Hanover.
6. Construct second small reservoir and act to protect well sites in Scituate.
7. Limit per capita use of water in four municipalities, if necessary.
8. Construct a new reservoir on Bound Brook in Cohasset.
9. Study long-range water supply options.

WATER QUALITY (Chapter 5)

1. Study potential for using treated wastewater to recharge Plymouth ground water.
2. Provide streambank buffer strips.
3. Establish local regulations to inhibit pond eutrophication.
4. Expand Cohasset's existing secondary treatment facility.
5. Complete an advanced treatment facility to serve Rockland.
6. Expand Plymouth's secondary treatment facility.
7. Construct a new secondary treatment facility in Marshfield.
8. Consider an advanced treatment facility on the North River.
9. Study and define the landfill leachate problem.
10. Provide pump-out facilities and treatment for watercraft wastes in coastal communities.

OUTDOOR RECREATION

Swimming

1. Secure public access to the shoreline.
2. Protect and manage Duxbury Beach, the Gurnet, and Saquish.
3. Construct parking lots along Route 3 and provide bus service to beaches.
4. Protect and manage five miles of beach in Scituate and Marshfield.
5. Encourage boat dry-storage high-rise facilities.
6. Consider fore-and-aft mooring practices.
7. Develop additional boat launching ramps in appropriate harbors.
8. Consider developing regional marina facilities in North Plymouth Harbor.

General Outdoor Recreation

9. Provide more camping and picnicking sites at Myles Standish State Forest.
10. Acquire additional access to "Great Ponds".
11. Develop guidelines for low-intensity recreation on selected storage reservoir lands.
12. Acquire the Pine Hills area in Plymouth.
13. Study the development of a trail along abandoned railroad beds.
14. Use SENE Development Capabilities Map for open space protection.
15. Designate the North and South Rivers as part of the state Scenic Rivers system.
16. Consider a visitors' center at the Route 3 North River bridge.

Wildlife and Fresh Water Fisheries

17. Use the Natural Resources Planning Program to reinforce wetlands legislation.
18. Acquire the most productive wetlands for wildlife.
19. Designate ponds 10 acres or larger as "Great Ponds".
20. Acquire public access to productive fishing ponds.
21. Acquire public access to productive streams.

MARINE MANAGEMENT (Chapter 7)

Aquaculture

1. Study aquaculture potential of estuaries.
2. Study potential for reuse of wastewater in aquaculture processes.

Urban Waterfronts

3. Coordinate local waterfront planning and development.
4. Provide guidance and set criteria at the state level for priority waterfront uses.
5. Review and coordinate waterfront use.
6. Provide federal funding for state and local waterfront development plans.

FLOODING AND EROSION (Chapter 8)

1. Develop flood plain management programs which maximize non-structural solutions.
2. Adopt local flood plain zoning preventing adverse flood plain development.
3. Establish local sediment and erosion control ordinances.
4. Establish forest buffer zones.
5. Establish local regulations to strengthen flood plain management.
6. Acquire significant flood plains and wetlands.
7. Locate in existing safe buildings in the flood plain.
8. Encourage natural stabilization of coastal erosion areas.

LOCATING KEY FACILITIES (Chapter 9)

See Regional Report, Chapter 9

RECOMMENDATIONS

GUIDING GROWTH (Chapter 3)

1. Protect priority Critical Environmental Areas.
2. Restrict development on other Critical Environmental Areas.
3. Manage growth on Developable Areas.
4. Use SENE resource development capability analysis to guide future growth.
5. Accommodate growth where services already exist.

WATER SUPPLY (Chapter 4)

1. Form Cape Cod and Martha's Vineyard water management agencies.
2. Regulate ground water pumping rates to prevent salt water intrusion.
3. Recycle cooling water by on-site aquifer recharge.
4. Prevent lowering of water table below mean sea level pending hydrologic studies.
5. Prohibit ground disposal of waste materials until health effects have been fully studied.
6. Determine position of salt-fresh water transition zone in coastal aquifers.
7. Establish local building codes, subdivision regulations, and zoning ordinances to encourage stormwater recharge basins.

WATER QUALITY (Chapter 5)

1. Enforce local subsurface disposal regulations.
2. Establish local regulations to inhibit pond eutrophication.
3. Construct or expand small collection systems in 14 towns.
4. Construct three new collection systems on Nantucket.
5. Investigate five possible inter-town sewer service areas.
6. Construct small secondary plant at Cuttyhunk with pump-out facilities for visiting yachts.
7. Consider land disposal, when proven feasible.
8. Construct pump-out facilities at marinas wherever possible.
9. Study pollution of ground and surface waters by solid waste leachates.
10. Attenuate runoff from new urban development.

OUTDOOR RECREATION (Chapter 6)

Swimming

1. Consider building parking lots on Route 6 with buses to the beaches.
2. Secure public access to the shoreline.

Recreational Boating

3. Maintain, or dredge, up to ten recreation boating channels.
4. Guide future marina development.
5. Encourage fore-and-aft mooring practices in protected anchorages.
6. Construct fishing piers and boat ramps along the shoreline.

General Outdoor Recreation

7. Encourage private campground and picnic area developments.
8. Increase the number of picnic facilities at the National Seashore, as necessary.
9. Manage Critical Environmental Areas for camping, picnicking, or hiking.
10. Acquire upland natural areas.
11. Maintain Noman's Land as a wildlife preserve.
12. Construct bicycle paths.
13. Use SENE Development Capabilities Map for open space protection.

Fish and Wildlife

14. Continue wildlife management on Otis Air Force Base.
15. Use the Natural Resources Planning Program to reinforce wetlands legislation.
16. Acquire the most productive wildlife habitats.
17. Include ponds 10 acres and over in Great Ponds legislation.
18. Acquire access to the most productive fish ponds.
19. Acquire access to the most productive fish streams.

MARINE MANAGEMENT (Chapter 7)

Shellfish

1. Provide State technical assistance for local shellfish management.
2. Study aquacultural potential of estuaries.
3. Provide State assistance for local aquacultural licensing and management.
4. Consider wastewater reuse for aquacultural operations.

FLOODING AND EROSION (Chapter 8)

1. Adopt flood plain zoning to prevent adverse flood plain development.
2. Acquire significant flood plains and wetlands.
3. Locate in existing safe buildings in the flood plain.
4. Encourage natural stabilization of coastal erosion areas.

LOCATING KEY FACILITIES (Chapter 9)

See Regional Report – Chapter 9

APPENDIX B

REGIONAL 208 PLAN RECOMMENDATIONS

MVPC 208 Plan Recommendations

Federal Recommendations

EPA

Industrial Wastewater Treatment

- Supply clear pre-treatment regulations, user charge requirements and industrial cost recovery guidelines
- Work with MA DWPC to update NPDES files

Landfills

- Carry out legislative mandate to develop landfill regulations

Stormwater Runoff and CSO Management

- Provide state and regional agencies with up-to-date information on stormwater sampling and modeling techniques and control measures

Soil Conservation Service

- Expand Essex County Soil Conservation Service to include soil scientist available for on-site inspections

State Recommendations

DEQE

Septic System Management

- Provide assistance in the review of large waste disposal systems

Industrial Wastewater

- Provide assistance to local boards of health regarding sub-surface disposal of industrial wastewater

Agricultural Activities

- Establish formal system of coordination among regional, state and federal agencies regarding agricultural pollution control programs

Residuals Management

- Investigate disposal of organic wastes not accepted for treatment at area treatment plants
- Establish program in conjunction with New Hampshire to control illegal hauling of septage across state lines
- Establish clear policies on septage disposal and utilization
- Clarify state agencies roles involved in sludge management
- Help communities establish programs for sludge management

DWPC

- Develop water quality model for Merrimack River

Septic System Management

- Reinstitute free sampling of surface water quality at Lawrence Environmental Station

Industrial Wastewater Treatment

- Provide pre-treatment guidelines to treatment plants with NPDES permits
- Work with EPA to update NPDES files
- Work with DEQE to issue permits that discharge to ground

Agricultural Activities

- Establish a non-point source sampling program including agricultural sites

Landfills

- Develop a monitoring program in conjunction with DEQE and local health boards

Residuals

- Develop state hazardous waste program in conformance with federal regulations

Stormwater Runoff and CSO Management

- Intensify stream sampling efforts
- Assess impact of untreated "pass through" wastewater at area treatment plants
- Develop storm and stream models for planning purposes
- Provide technical assistance regarding need to eliminate CSOs in area cities

Regional Recommendations

MVPC

- MVPC should emphasize implementation of the 208 plan and receive additional funds to carry out their responsibility

Septic System Management

- Determine appropriate setback requirements to lessen nutrient loading
- Provide technical assistance to communities to develop water quality related bylaws and regulations
- Analyze septic system failures and develop alternative disposal options
- Work with local health boards to establish water quality sampling programs

Industrial Wastewater Treatment

- Coordinate local compliance with federal regulations including technical assistance and data management

Agricultural Activities

- Work with Soil Conservation Service to establish forums among government agencies to discuss abatement of agricultural pollution problems

Residuals Management

- Serve as liaison among communities to solve septage disposal management problems
- Coordinate levels of government in an effort to establish a program of residuals management using innovative disposal techniques
- Coordinate levels of government to establish a policy for sludge management

Stormwater Management

- Work with DWPC and local boards to establish stormwater sampling sites
- Help communities identify sources of funding for abatement of stormwater runoff pollution
- Assess impact of stormwater runoff contamination of shellfish

Recreational Use of Wastewater Treatment Facilities

- Analyze recreational opportunities associated with treatment facilities and publicly owned lands
- Identify environmentally critical areas
- Develop criteria and guidelines to determine suitability of sites for recreational use
- Develop public participation program to assess recreation needs

Local Recommendations

For each community in the MVPC study area, the 208 plan performed an inventory and analysis of pollution problems affecting water quality. It provided specific pollution abatement recommendations for each community in each of the 16 issue areas for which sufficient analysis was performed. Specific recommendations included structural solutions, such as the expansion of wastewater treatment facilities, and management solutions aimed at improving local land use control programs. The non-structural solutions often involved amendments to local development bylaws to increase the protection of critical water resources. The following is a representative list of recommendations directed to communities in the Merrimack Valley region.

Municipal Wastewater Treatment

- The MVPC 208 report recommended construction or expansion of wastewater treatment facilities in Amesbury, Salisbury and Newburyport.

Septic System Management

- Perform detailed studies to determine the impact of septic system contamination of ground and surface water
- Increase setbacks between septic systems and water bodies to 75 feet
- Establish surface water monitoring programs
- Establish public education programs regarding septic system maintenance
- Develop board of health monitoring programs
- Regulate septic system installers through a permitting program
- Raise minimum lot sizes in problem areas

Industrial Wastewater Treatment

- Work with EPA to determine the need for pre-treatment programs to control industrial discharges to public treatment facilities
- Perform surveys of local industrial wastewater discharges
- Perform on-site inspections of local industries
- Update local sewer ordinances to control unregulated industrial sewer hookups

Agricultural Activities

- Work with regional and state agencies to strengthen existing programs through the use of memoranda of understanding; develop best management practices for the control of

agricultural pollution

- Work with DWPC to develop non-point source sampling program

Residuals Management

- All septage from Georgetown, Rowley, West Newbury, Merrimack and Salisbury should be hauled to Haverhill and/or Greater Lawrence Treatment plants

Stormwater Runoff and CSO Management

- Establish programs and build systems to improve stormwater collection including:
  - Street sweeping
  - Catch basin cleaning
  - Stream channel maintenance
  - Vegetated buffer strips
  - Improved infiltration systems, detention basins
- Establish stormwater sampling programs
- Encourage use of natural drainage features and non-structural controls
- Establish programs for routine maintenance of runoff collection systems

Lakes and Pond Management

- Establish water quality sampling program; locate sampling stations in areas where future development borders water bodies

MAPC 208 Plan Recommendations

General Recommendations

The MAPC 208 report covers 92 communities in the metropolitan Boston region and a population of approximately 3 million people. The area includes densely-developed cities and rural communities and supports a wide range of land uses. As a result of the high density of land use in the area, the report identified a wide range of water quality problems from point and non-point sources.

In order to respond to these problems, the report set forth comprehensive recommendations for management agencies at the local, state and federal levels. The plan included general recommendations for water quality planning policy and specific recommendations to address immediate and pressing water pollution problems.

Federal general recommendations

- Connect the objectives of federal statutes and funding and administrative priorities to broader national goals regarding land use, environmental protection, and economic development
- Balance priorities between wastewater treatment and water supply infrastructure development
- Encourage and promote water quality planning initiatives at the local level
- Coordinate federal water resources planning with the wide variety of federal programs which impact collectively on metropolitan regions

State general recommendations

- Continue and escalate emphasis on comprehensive growth management, and coordinate goals of various state programs
- Develop strategy for collaboration among state agencies and develop constituencies favorable to problem solving
- Emphasize preservation of environmental resources as well as restoration

State specific recommendations

- Provide regulation and management of coastal resources
- Develop state policy regarding protection of areas of critical environmental concern
- Promote optional land use patterns: cooperation between state agencies for environmental protection, economic development, transportaton, and recreation
- Develop environmental data management capabilities
- Advise and assist local governments

State recommendations were made for:

- Executive Office of Environmental Affairs (EOEA)
- Coastal Zone Management (CZM)
- Department of Environmental Quality Engineering (DEQE)
  - Develop guidance for acceptable publicly-operated treatment works (POTW) regarding treatment processes and practices

- Relax prohibition on communal subsurface disposal systems
- Resume jurisdiction over discharges between 2,000 and 15,000 gallons per day
- Provide technical assistance
- Amend landfill regulations to prevent poor siting selection

Local Recommendations

The MAPC 208 also set forth important water quality protection and preservation recommendations to be carried out at the local level. The solutions recommended were developed and chosen by the regional agency in conjunction with citizens and public officials of the MAPC communities. Because water is a shared resource, the MAPC 208 plan was developed with a regional perspective. However, because Massachusetts has a strong home rule tradition, recommendations were developed for each municipality.

The specific recommendations included structural and non-structural proposals organized into major issue areas, including:

- Wastewater Treatment
- Stormwater Management
- Industrial Wastewater
- Non-Point Sources
- Preventive Land Use Controls
- Management

Wastewater Treatment

Recommendations for improvement of wastewater treatment included both structural and non-structural actions to resolve water quality problems. The towns in which the 208 Plan proposed structural solutions, (e.g., expansion or construction of a wastewater treatment facility or conveyance infrastructure) are listed below. In addition, a description of representative non-structural recommendations is provided. Structural wastewater treatment solutions were proposed in the following towns:

Location	Proposed Action	Completed
Boston	Eliminate combined sewer overflows (CSOs)	Ongoing
Cohasset	Expansion of existing facility and extension of sewerage service area	No tied into Hull
Danvers	Eliminate CSOs according to 201 planning	Ongoing
Hull	Complete current expansion	Yes
Lynn	Complete current plant construction	Ongoing
Nahant	Complete current plant and infrastructure expansion; extend sewer lines to problem areas	Yes
Randolph	Complete current expansion, further planning	Yes
Salem	Complete current improvements	Ongoing
Somerville	Combined sewer overflow improvements	Ongoing

In most cases the recommendations for structural improvements included continued planning in conjunction with the 201 Construction Grants Program. Recommendations that propose the construction or expansion of treatment facilities also emphasized the importance of considering the implications of additional growth due to expanded sewer service.

In those communities for which no structural solutions were proposed, the 208 plan set forth a range of non-structural recommendations to improve the management of wastewater problems. Non-structural recommendations included:

- Septic system maintenance programs that include monitoring and public education
- Water conservation measures
- Regional coordination for the disposal of sludge
- Assessment of the future need for expansion of sewer services, especially in relation to combined sewer overflow problems in densely populated areas

Stormwater Management

Recommendations for the control of stormwater runoff and combined sewer overflow pollution included both structural and institutional solutions. The 208 study determined that the most appropriate runoff control methods included:

- Street sweeping
- Catch basin cleaning
- Outfall maintenance
- Stream channel maintenance

Specific recommendations for each town in regard to stormwater management typically included these types of maintenance control methods. In problem areas, however, recommendations included more stringent controls including:

- Amendments to local development bylaws to reduce impervious surfaces and prevent pollution transport off the land surface
- Use of natural drainage characteristics
- Structural controls such as construction of end of pipe storage treatment, settling basins, and routing to treatment plants

To remedy combined sewer overflow problems the 208 plan typically recommended construction or expansion of structural controls such as separation from sewage disposal and the installation of catchment mechanisms to remove solids, and filter or disinfect runoff.

Industrial Wastewater

The MAPC 208 plan included an assessment of industrial wastewater pollution problems in the region. This involved an inventory of all industrial discharges to water courses or to wastewater collection systems, and an analysis of the cumulative impact of industrial discharges on water quality. The study made specific recommendations to supplement regulatory actions taken by federal and state agencies controlling industrial discharges through the National Pollution Discharge Elimination System. These recommendations included:

- Adoption of local sewer user laws to regulate the installation of sewer connections
- Encourage industrial programs to conserve and recycle processed wastewater
- Require new industries to pretreat wastewater eventually disposed to publicly- owned treatment works

Non-Point Sources

While the MAPC 208 plan acknowledged many sources of non-point pollution, recommendations in the non-point section were limited to landfill leachate and the storage and application of road salt. Recommendations to control contamination of water from landfills included:

- Surface and groundwater monitoring to determine the impact of landfill leachate
- Closing and sealing landfills that threaten local water quality
- Cooperation among neighboring towns and consideration of regional options for future solid waste disposal and management

Recommendations to control the impact of road salt storage and application included:

- Requirements that salt be stored in covered sheds with impervious floors
- Development and implementation of sensitive salt application programs including mapping of local drainage basins and the locations of salt sensitive environmental receptors, and the designation of sensitive areas as no salt or minimal salt zones
- Training of highway crews in minimal salt application procedures

Preventive Land Use Controls

The MAPC 208 plan recommended the use of preventive land use management techniques to supplement the development bylaws and water quality protection regulations of each town. The plan recommended specific management tools to strengthen local zoning, subdivision and land use regulations and called for comprehensive and cooperative management among various local boards and officials. For some communities, several recommendations are made; most have one or two recommendations, usually in the form of amendments to zoning or subdivision regulations. The recommended land use controls included:

- Natural resource districts:
  - wetlands districts
  - floodplain districts
  - aquifer recharge districts
  - buffer districts
  - watershed protection districts
- Use and density regulations
- Cluster and planned unit development (PUD)
- Site plan review
- Subdivision controls
- Innovative controls

Management

In order to facilitate the implementation of structural and non-structural solutions made throughout the

208 study the plan, included management recommendations for local administrators. For the most part, these recommendations are aimed at planning boards, boards of health and conservation commissions, although other municipal agencies and administrators were mentioned. The plan recommended specific actions that boards in each town should take to improve local water quality management; however, these specific recommendations are too numerous to mention. In general, they stressed inter-municipal cooperation and coordination of water quality planning goals, increased interaction among local boards, and sharing of resources and data to avoid duplication of work.

Although the plan generally promoted local solutions, it also recommended, where appropriate, inter-community or regional solutions to water quality management problems. This was especially true when regional solutions were seen to be more cost-effective than local management options. Inter-municipal agreements were particularly beneficial for large structural management solutions.

CCPEDC 208 Plan Recommendations

General Recommendations

The CCPEDC 208 report included a very detailed inventory and analysis of the Cape's groundwater--the region's sole source of drinking water. It directed extensive recommendations toward federal, state, regional, and local government agencies aimed at protecting and improving water quality. The primary focus was on non-point sources of pollution which were seen as the greatest threat to existing and potential public water supply wells and the groundwater resource as a whole. Recognizing that the control of non-point sources would be best accomplished through improved development bylaws at the local level, the bulk of recommendations were directed toward the Cape's 15 towns. In addition to calling for increased local action, the 208 report emphasized the importance of building intermunicipal and regional strategies to more effectively protect the region's shared water resources. Recommendations were divided into six categories:

- Wastewater management
- Land use controls
- Water supply management
- Non-point source controls
- Water conservation
- Management agencies

Wastewater Management

The Cape 208 report found that the greatest threat to the region's water quality was the failure of on-site septic systems. The plan identified and mapped three categories of problem areas and recommended management plans according to these categories. For the areas with the worst problems--densely-populated town centers or areas within recharge areas to public water supply wells--the report recommended differing degrees of centralized sewerage facilities expansion or construction. Seven areas were identified in Category I:

Buzzards Bay/Wareham	Chatham
South Sagamore/Sandwich	Barnstable
Falmouth	Provincetown/Truro
Yarmouth	

In these areas, the report recommended coordination of the 208 recommendations with sewerage facilities planning under the 201 program.

In Category II areas, the report recommended improved on-site septic systems management such as mandatory inspection and pump-out programs, and the construction of small treatment facilities or package plants. Six areas were identified in this category:

Barnstable	Harwich
Bourne	Orleans
Dennis	Wellfleet

For Category III areas, the report recommended further analysis of existing and potential water quality

problems. In these areas, and in the rest of the Cape not identified in any of the three categories, the report recommended adoption of on-site septic system managment controls and improved land use development bylaws at the local level.

Wastewater management recommendations include:

State

- Revise Title 5 to more accurately reflect soil conditions
- DWPC should base funding priority on Cape-wide 208 recommendations
- DEQE should promote regional treatment facilities and septage treatment options

Local

- Category I towns should complete 201 plans and complete construction in five years
- Enter into regional agreements for septage treatment
- Hire health agent and require inspections and upgrading of marginal septic systems
- Prohibit the use of septic system cleaners
- Develop public education programs for septic system use
- Adopt health bylaws more stringent than Title 5 (model bylaws provided)

Land Use Controls

The 208 report recommended adoption of a wide range of local land use controls stating that improved development bylaws could protect water quality in three ways:

- Prevent harmful activities
- Allow activities in areas where they do not harm resources
- Modify land uses to minimize the effect of activities

The recommendations were directed primarily at local governments gave special emphasis to non-point pollution sources that occurred in and around:

- Recharge areas to public water supply wells
- Areas relying on private wells
- Areas upgradient of great ponds and coastal embayments

One of the primary tools recommended for adoption by towns was an aquifer or watershed protection district. The report recommended that towns work with CCPEDC to delineate the recharge areas to local water supplies and then adopt a strategy to protect the areas. The proposed strategy included amendments to existing zoning and adoption of zoning overlay districts, amendments to health bylaws and land acquisition programs. The report included a model aquifer protection bylaw which a wide range of regulatory elements:

- Regulation of on-site septic systems based on a calculation of nitrogen loading to groundwater--not to exceed 5 ppm (parts per million)
- Minimum lot size limits
- Prohibition of hazardous land uses
- Cluster and open space provisions
- Lot coverage maximum of 10%

- Provisions to limit surface water runoff

In addition, the report recommended that state and federal governments provide funds for aquifer land acquisition and that CCPEDC provide technical assistance to towns to delineate recharge areas to public wells.

Water Supply Management

The 208 report stated that the Cape has an abundant supply of water in its regional aquifer and that prevention of contamination should be the primary priority. It found a great need for cooperation and integration among public and private water suppliers and for regional coordination to develop a Cape-wide resource protection strategy.

Recommendations include:

Federal
- Work with CCPEDC to designate the Cape's groundwater as a sole-source aquifer

State
- Coordinate permitting for new water supply sources with 208 recommendations
- Provide funds for development of a regional water supply management plan

Regional
- Expand groundwater monitoring program in conjunction with USGS
- Provide technical assistance to towns
- Work toward sole-source designation

Non-Point Source Controls

The 208 report considered non-point sources as the greatest threat to groundwater. The vast array of recommendations in this issue area reflect this regional priority. Six categories of pollution sources are identified; recommendations are made to address these problem areas:

Landfills
Stormwater runoff
Road salt storage and application
Gasoline and oil storage and spills
Saltwater intrusion
Vessel discharges

Recommendations include:

State
- DEQE/DWPC/EOEA should improve and enforce landfill policy and regulations and promote source reduction
- Develop Best Management Practices for stormwater management
- Construct salt storage facilities
- Require construction of vessel pump-out facilities in problem areas
- Require that underground storage tanks be constructed of fiberglass

Regional

- Develop regional solid waste management program; encourage recycling and source reduction
- Encourage Best Management Practices to reduce agricultural runoff
- Develop a reduced road salt application program
- Locate, map and develop education program for underground storage tanks

Local

- Expand life of local landfills through recycling, compaction and composting
- Adopt performance standards to reduce stormwater runoff and erosion
- Eliminate use of salt in recharge areas
- Build salt storage facilities
- Require testing and replacement of old and marginal underground storage tanks

Water Conservation

The 208 report identified public education as the critical element in a regional water conservation policy. It recommended that CCPEDC coordinate the development of such a conservation plan. Other recommendations include:

State

- Develop state-wide water conservation plan

Local

- Install water-saving devices in all municipal buildings
- Require water-saving devices in all local building codes

Management Agencies

The 208 plan recommended the establishment of regional and local water resources advisory committees to provide public input in the development of regional policies and in local development decisions.

The regional Water Resources Advisory Committee (WRAC) was designed to:

- Work with CCPEDC staff on water protection strategies
- Review and comment on the 208 report
- Support and contribute to 208 implementation
- Review local 201 planning and construction projects

The local Water Quality Advisory Committees were designed to:

- Provide coordination between town boards on water resource impacts
- Develop intermunicipal cooperative agreements
- Coordinate local 208 implementation
- Provide local contact to CCPEDC
- Participate in 201 planning and construction