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**A SUMMARY OF IMPLEMENTATION AND DEMONSTRATION PROJECTS
IN BAYS AND ESTUARIES**

VOLUME I

Office of Water
Office of Wetlands, Oceans and Watersheds
and
Region I
Water Management Division

U.S. Environmental Protection Agency
Washington, DC 20460

November 1992

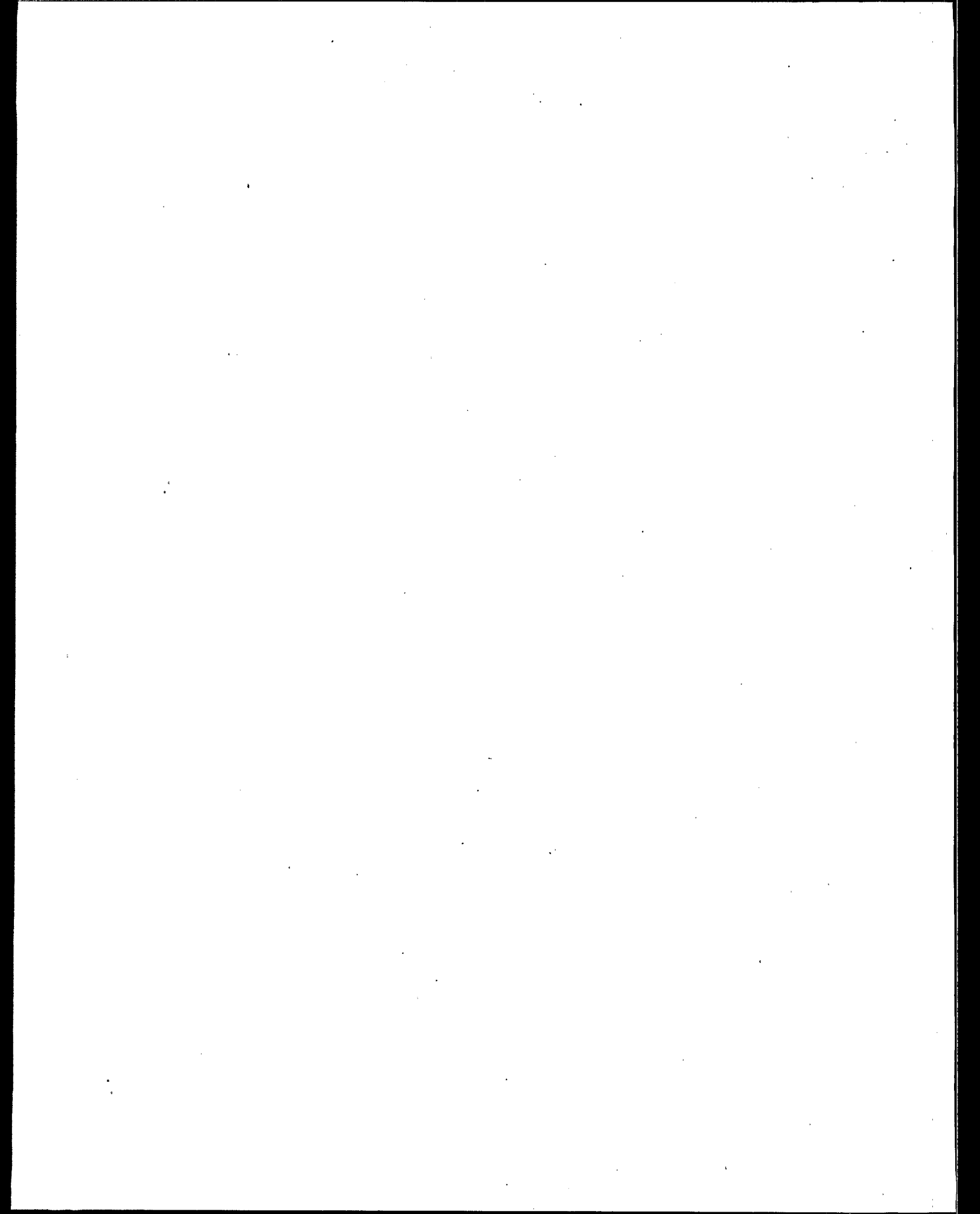


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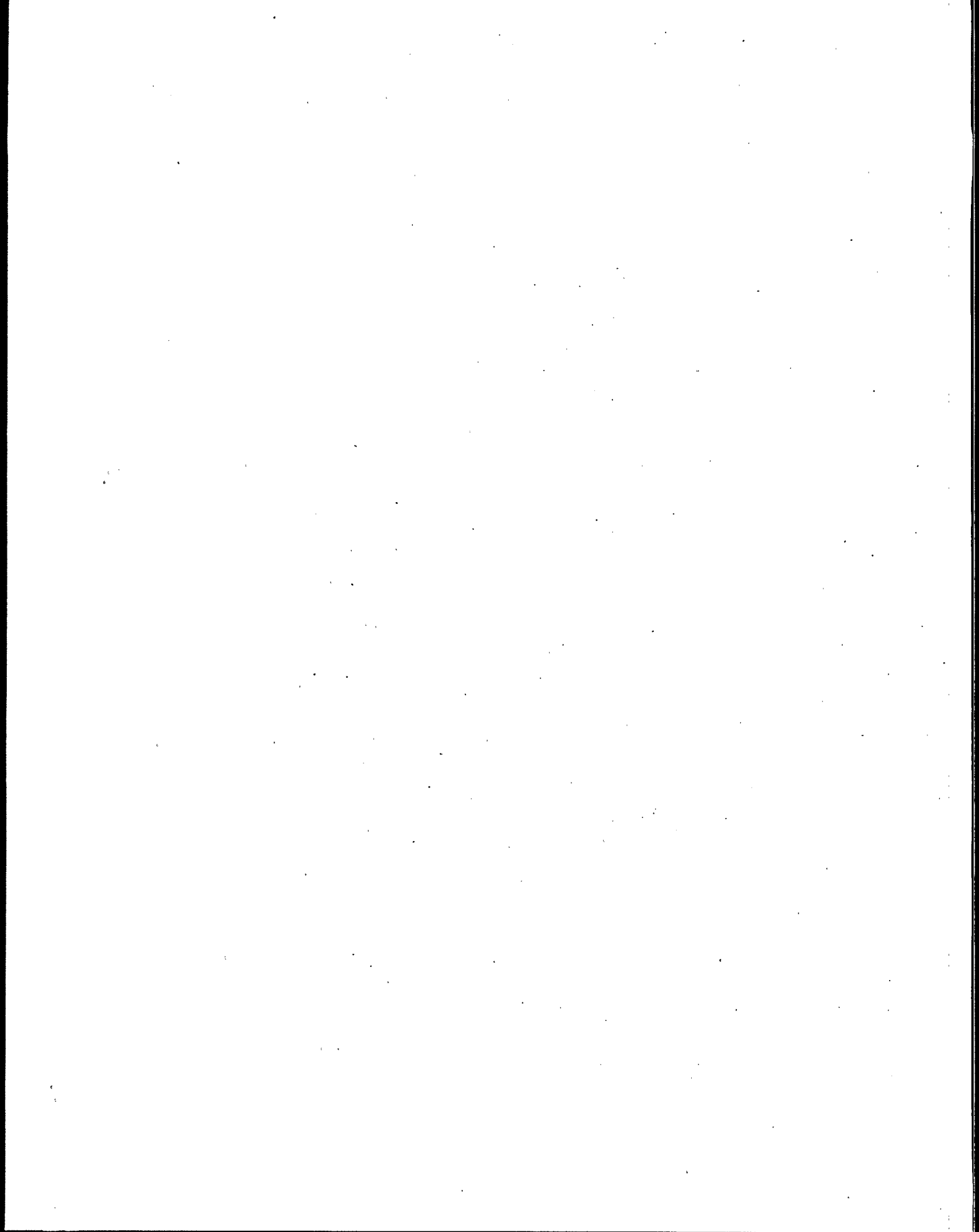
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ACKNOWLEDGEMENTS

We wish to thank the following people for the assistance and cooperation they provided in gathering information for this document.

Albemarle-Pamlico Sounds: Joan Giordanno; Sandi Horton; Spencer Rodgers; Jennifer Steel; Randy Waite. **Buzzards Bay:** Joseph Costa; George Heufelder; David Janik; Carol Kilbride. **Chesapeake Bay:** Gould Charshee; Mike Haire; Ed Stiggal; Tom Tapley; **Delaware Bay:** Marjorie Crofts; Mary Downes-Gastrich - DELEP; Steve Feltenberger - EPA Region 2; Jay Laubengeyer - Cumberland Co. Planning. **Delaware Inland Bays:** John Schneider - Delaware Inland Bays Program; **GALVESTON BAY:** Frank Shipley - Galveston Bay Program; Carol Ward - Galveston Bay Program. **Indian River Lagoon:** Derek Busby - Indian River Lagoon Project; Robert Day - Indian River Lagoon Project. **Long Island Sound:** Susan Beede - EPA Region 1; Cynthia Pring-Ham - EPA Region 1; Paul Stacey - Long Island Sound Study. **Narragansett Bay:** Richard Enander - RIDEM; Katrina Kipp - EPA Region 1; Jennie Meyers - Land Management Project; Clayton Pennimen - Narragansett Bay Project; Terry Whalen - Land Management Project. **New York/New Jersey Harbor:** Seth Ausubel - EPA Region 2; Dawn Blauth - NY/NJ Harbor Project; Mary Downes-Gastrich - NY/NJ Harbor Project; Cindy Rovins - NY/NJ Harbor Project. **Puget Sound:** Kevin Anderson - PSWQA; Rika Cecil - WA Office of Envir. Education; John Dohrmann - PSWQA; Dana Duxbury - Dana Duxbury & Associates; Jane Rubey Frost - WA Dept of Ecology; William Green - WA Dept of Ecology; Nancy Hansen - City of Bellevue; Kathy Minsch - PSWQA; Bob Sanders - PSWQA; Randy Scott - PSWQA; Mike Spranger - WA Sea Grant; Bob Steelquist - PSWQA; Ken Stone - WA Dept of Ecology; Michael Wheeler - PSWQA. **San Francisco Bay:** Rachael Dagovitz - San Francisco Estuary; Tim Vendlinsky - EPA Region 9; Scott Wiley - Alameda Co. Flood Control; Sam Zeigler - EPA Region 9; Amy Zimpfer - San Francisco Estuary. **Santa Monica Bay:** Karen Ceasar - Santa Monica Bay Program; Catherine Tyrrell - Santa Monica Bay Program; Maryann Yamaguchi - Santa Monica Bay Program. **Sarasota Bay:** Mark Alderson - Sarasota Bay Program; J.P. Marchand - Sarasota Co. Stormwater; Heidi Smith - Sarasota Bay Program; Doug Taylor - City of Sarasota; Susan Walker - Sarasota Bay Program. **Tampa Bay:** Richard Eckenrod - Tampa Bay Estuary Project; Mary Hoppe - Tampa Bay Estuary Project; Karen Lind - Tampa Bay Estuary Project.

Technical support for development of this document was provided by Metcalf and Eddy under EPA Region I Contract 68-D-90163 with funding from the Casco Bay Estuary Project, the Massachusetts Bays Program, and EPA Region I. Original cover artwork by Sandra Koch.



A SUMMARY OF ACTION PLAN DEMONSTRATION PROJECTS IN THE NATIONAL ESTUARY PROGRAM

EXECUTIVE SUMMARY

The Massachusetts Bays Program (MBP) and Casco Bay Program have recently been added to the National Estuary Program (NEP). A major theme of the MBP and CBEP is to take action now to protect and restore the Bay ecosystems. To achieve this agenda, the MBP and CBEP are interested in better understanding the many implementation and demonstration activities that have been undertaken in other estuary programs and how they may apply to the problems facing Massachusetts and Casco Bays. Therefore, in this project, various demonstration and implementation activities undertaken in other estuary programs are reviewed for effectiveness, transferability, and applicability to Massachusetts and Casco Bays.

The projects investigated include demonstration projects as well as unique programmatic initiatives of 15 NEPs and are divided into 11 separate project categories.

- Boat and Marine Wastes
- Contaminated Sediments
- Land Use and Development Controls
- Local Government and Community Involvement
- Nutrient Loading
- On-site Disposal Systems
- Public Outreach and Education
- Shellfish Bed Protection and Restoration
- Stormwater Controls
- Toxic Waste Reduction
- Wetlands/Habitat Protection and Restoration

REPORT FORMAT

This project was conducted in a phased approach, with an initial inventory of projects followed by a selection of potentially applicable projects for further investigation. The report is divided into three sections. Section I outlines background information and the method by which projects were investigated and summarized. Section II contains project summaries for 29 separate projects of particular interest to members of the Massachusetts and Casco Bays Estuary Programs. These project summaries are organized according to the 11 categories listed above. Section III contains a complete listing of 180 demonstration projects and estuary program structures identified during this project. This listing of projects, organized by category, also includes a brief description of the project, its status, and a reference for further information. This summary document is directed toward members of the MBP and is designed to direct the reader to areas of the report of particular interest to the MBP.

BOAT AND MARINE WASTE

Two basic categories of projects are included under those addressing boat and marine wastes: discharge/pumpout facilities and general waste recycling projects. Of the projects identified, the projects dealing directly with the issue of pumpout facilities are generally just under way and had not reached conclusions. Therefore, the project summaries focus on two debris recycling projects directed toward boat operators and marinas. Both of these projects have been successful and outline potential program structures that could be implemented in Massachusetts Bays.

CONTAMINATED SEDIMENTS

Although the estuary programs investigated for this project generally identified contaminated sediments as a problem within the estuary, very few projects have been conducted to address the issue. The three projects identified have all been conducted in Puget Sound. The project summarized in Section II resulted in the development of sediment cleanup guidelines. These guidelines are some of the only guidelines existing for sediment cleanup. They consider aspects such as human health risks and cleanup costs. These guidelines may be of interest to the MBP as a starting point in the development of guidelines specific to Massachusetts Bays.

LAND USE AND DEVELOPMENT CONTROL PROJECTS

The two projects investigated for this category have both been conducted in other NEPs in New England. They have both been successful and address issues of interest to Massachusetts Bays. The Dartmouth Water Quality Management Plan was conducted at the municipal level and could serve as an example of watershed planning for communities within the Massachusetts Bays area. Also, the Narragansett Bay Land Management Project has been successful at improving community awareness of land management issues. Many of the individual activities of the Land Management Project could have direct applicability to the Massachusetts Bays watershed communities.

LOCAL GOVERNMENT AND COMMUNITY INVOLVEMENT

This category of projects is universally recognized by NEP members as being important to the overall success of a bay program. The involvement of local officials in the decision making process and the implementation of demonstration projects is essential. The projects most directly applicable to Massachusetts Bays include two projects conducted by the Buzzards Bay Project. A nonpoint source control document for local officials was developed and has been distributed to officials throughout the coastal regions of Massachusetts. , Therefore, many of the communities in the Massachusetts Bays watershed will already be familiar with this document. In addition to the development of this document, the Buzzards Bay Project's Buzzards Bay Advisory Committee and Coalition for Buzzards Bay are two organizations that could serve as models for local involvement in Massachusetts Bays.

NUTRIENT LOADING

Nutrient loading is generally a problem in all estuaries within the NEP. Various categories of projects designed to address the problems of excessive nutrient loads have been attempted. These range from phosphate detergent bans and the implementation of biological nutrient

removal to the development of watershed plans and agricultural water quality cost share programs. Of the projects investigated for this report, the Buzzards Bay Nitrogen Overlay Project could be directly applicable to Massachusetts Bays. In this project, a methodology was developed for calculating existing nitrogen loading and acceptable nitrogen loading limits for the Buttermilk Bay drainage basin. New zoning bylaws were developed and adopted by three towns to reduce future development, thereby reducing the amount of nitrogen entering the bay. The results of this - project could be applied throughout the Massachusetts Bays area.

ON-SITE DISPOSAL SYSTEMS

Very few demonstration projects have been conducted to reduce pollutant loads from on-site septic systems. However, a project was conducted in Buzzards Bay to develop model health regulations for the siting and construction of on-site disposal systems. These model regulations are in the form of supplements to the existing Massachusetts Title 5 regulations and specify stricter standards for setbacks, depth to groundwater, and percolation testing. Since these supplements directly address Title 5, they could be applicable for communities within the Massachusetts Bays watershed.

PUBLIC OUTREACH AND EDUCATION

Like local government involvement, public education and outreach are very important aspects of all estuary programs. This is the category of projects with the most existing demonstration projects. Every estuary program in the country has spent considerable time in developing an effective public education program. Most of the projects implemented by estuary programs utilize conferences, media outlets, monthly newsletters, field trips, and other common techniques for reaching citizens. However, there are also many unique programs under way in the various estuaries. The table in section III of the report should be investigated closely for many of these programs. However, Section II outlines one project that is particularly innovative and successful. The Puget Sound Teacher Training Program not only provides training for elementary and high school educators, but the program also provides funding for the teachers to take days out of work to attend seminars and educational opportunities. The idea of providing training as well as a funding incentive to attend the training has been very successful and has potential for development within the Massachusetts Bays region.

SHELLFISH BED PROTECTION AND RESTORATION

Most of the effort expended to date on shellfish bed protection and restoration has gone toward research into the causes of shellfish bed closure. Since these efforts have not led to implementation activities, they were not investigated for this report. Some implementation activities have been conducted, and these are listed in the table in Section III. However, all of the projects that have been conducted are very particular to the types of problems facing the specific estuaries. It was found that the projects are not very transferable to Massachusetts Bays. Therefore, there are no shellfish bed protection and restoration projects' outlined in Section II.

STORMWATER CONTROLS

Most estuary programs have conducted demonstration projects for the control of stormwater

pollution. Most of these projects are directly applicable to Massachusetts Bays. However, some of the projects have been very innovative and have led to interesting conclusions. The Mamaroneck Harbor project in Long Island Sound reached the conclusion that maintenance activities such as street sweeping and catch basin cleaning are not very effective at reducing stormwater pollution.' The Maryland Stormwater Quality Control Cost Share Program has been one of the most successful programs in the country for funding runoff control projects. Also, the San Francisco Bay Artificial Wetlands Project and the Buzzards Bay Electric Avenue Beach Project will be developing useful data on the effectiveness of artificial wetlands and infiltration systems for the control of stormwater runoff pollution.

TOXIC WASTE REDUCTION

Toxic waste reduction programs have been implemented within many estuary programs. The Rhode Island Hazardous Waste Reduction Project has been particularly successful at reducing toxic waste discharges from industrial sources. Through this program, many industries throughout the Narragansett Bay watershed have implemented hazardous waste reduction programs. This program could serve as a model for the reduction of toxic wastes in the Massachusetts Bays watershed.

WETLANDS/HABITAT PROTECTION AND RESTORATION

Many of the projects identified under this category could be directly applicable to Massachusetts Bays, and the table in Section III should be investigated. However, the projects outlined in Section II are particularly unique. These projects include a shoreline erosion control project conducted in Albemarle/Pamlico Sound, a stream preservation effort that has become a national model in Puget Sound, and an actual habitat restoration project in Sarasota Bay. All of these projects could provide valuable guidance for similar effort in Massachusetts Bays.

SUMMARY

The final report contains a variety of information on demonstration projects conducted through the National Estuary Program. If the reader is interested in detailed information on specific projects conducted, the project summaries in Section II provide a good starting point, with references at the end for obtaining further detailed information. However, if the reader is more interested in seeing the full scope of projects conducted through the NEP, the Table in Section III serves as a more logical starting point. In either case, it will be noticed that few actual reports have been written about the implementation projects conducted through the NEP. Therefore, additional information concerning specific project will generally only be available by contacting the project contact listed at the end of each project summary.

SECTION I - INTRODUCTION

NATIONAL ESTUARY PROGRAM BACKGROUND

In 1987, with the passage of amendments to the Clean Water Act (CWA), Congress officially created the National Estuary Program (NEP). The purpose of this program is to identify nationally significant estuaries, protect and improve their water quality, and enhance their living resources (U.S. EPA, 1990). Estuaries are selected into the NEP based on their potential to address issues of significant national concern and the demonstrated commitment by various parties to protect valuable resources. Currently, 17 estuaries are part of the NEP with five being recently added to the 12 existing programs. Common problems found in these estuaries include contamination from toxicants and pathogens, nutrient loading, habitat loss, declining abundance in living marine resources, agricultural and urban runoff, and waste disposal activities.

Once an estuary is accepted into the NEP, EPA formally convenes a Management Conference which must develop a Comprehensive Conservation and Management Plan (CCMP) to protect the estuary. The Management Conference must also build a base of support to carry out the recommended actions outlined in the CCMP.

In addition to developing CCMPs, Management Conferences also conduct extensive research activities and implement projects to improve the water quality of the estuary. These projects are usually demonstration activities, which are implemented on a small scale but can have applicability to larger areas of the estuary.

REPORT PURPOSE AND OBJECTIVE

The Massachusetts Bay Program (MBP) in Massachusetts and the Casco Bay Estuary Program (CBEP) in Maine are two of the five recently added estuaries to the NEP. Both of these programs are overseen by the U.S. EPA Region I office in Boston, Massachusetts and have recently convened their management conferences. A major theme of the MBP and CBEP is to take action now to protect and restore the ecosystem. To achieve this agenda, the MBP and CBEP are interested in better understanding the many implementation and demonstration activities that have been undertaken in other estuary programs and how they may apply to the problems facing Massachusetts and Casco Bays. Therefore, the purpose of this project is to review and assess demonstration and implementation activities undertaken in other estuary programs for effectiveness, transferability, and applicability to Massachusetts and Casco Bays.

The projects investigated for this report include demonstration projects as well as unique programmatic initiatives of the national estuary programs and also Chesapeake Bay, which is a program that predates the creation of the NEP. Estuary programs investigated for this report include those shown in Table 1.

Table 1: National Estuary Programs Investigated

Albemarle/Pamlico Sound
Buzzards Bay
Chesapeake Bay
Delaware Bay
Delaware Inland Bays
Galveston Bay
Indian River Lagoon
Long Island Sound
Narragansett Bay
New York/New Jersey Harbor
Puget Sound
San Francisco Bay
Santa Monica Bay
Sarasota Bay
Tampa Bay

REPORT FORMAT

This report contains information pertaining to action/demonstration projects and unique programmatic aspects of each of the above listed estuary programs. This project was conducted in a phased approach, with an initial inventory of projects and selection of potentially applicable projects by representatives of the Massachusetts and Casco Bay Programs for further investigation.

This section outlines the approach by which information was obtained on each of the projects addressed in this report and outlines the process for selecting projects of interest. Section II contains the detailed project summaries of the selected projects which are arranged according to the issues they address under the 11 categories shown in Table 2.

A complete listing of all projects and estuary program structures identified during this project is included in Section III. This listing of projects, organized by category, also includes a brief description of the project, its status, and a reference for further information. Since many projects could be included under more than one category, Appendix A contains a matrix to cross reference projects between the major categories listed above.

Table 2: NEP Project Categories

Boat and Marine Wastes
Contaminated Sediments
Land Use and Development Controls
Local Government and Community Involvement
Nutrient Loading
On-Site Disposal Systems
Public Outreach and Education
Shellfish Bed Protection and Restoration
Stormwater Controls
Toxic Waste Reduction
Wetlands/Habitat Protection and Restoration

PROJECT APPROACH

The large scope of this project required the establishment of many contacts within each of the estuary programs. Information was gathered through research, document reviews, meetings, correspondence, and phone calls. The process for gathering and reviewing information began with a request for information letter which was sent to the Directors and Managers at the fifteen National Estuary Programs listed above. Follow up phone calls were made a week later and documents began to arrive on a regular basis. Exhibits of correspondence used for obtaining project information are included in Appendix B. Upon receipt of a document, the document name and author were logged into a document inventory logbook and a central document library was created.

Documents received from the Estuary Programs were reviewed for applicable projects. Approximately 180 structural, non-structural, and programmatic demonstration and implementation projects were extracted from the documents. These projects are briefly summarized and included in Section III. Scientific studies, surveys, and computer modelling were not considered applicable "projects" for this report. When document review was completed, a draft form of Section III was sent for review by appropriate staff within each of the Estuary Programs. Comments and suggestions from their feedback were incorporated into the Section.

From the list of projects in Section III, state and federal representatives from Massachusetts Bay and Casco Bay selected 29 projects as "projects of interest" for this report. Selection was based on a set of criteria that are discussed in Section I of this report. For each of these selected projects, a two to three page summary has been prepared. The detailed information needed to prepare the summaries was obtained through project literature and by contacting project managers, staff, and principal investigators. To insure accuracy in the summaries, a copy of

each completed project write up was sent to the appropriate contact for review and approval. The contacts provided feedback and comments to insure that the project summaries are complete, current, and technically accurate.

SELECTION CRITERIA

From the master list of projects in Section III, 29 projects were selected for a more detailed review and assessment. Selection of these projects was conducted by representatives of Massachusetts Bay and Casco Bay based on the criteria listed below in Table 3.

Table 3: Projects of Interest Selection Criteria

-
1. At least one project must be selected for each of the eleven water quality issues in Table 2 with the exception of Shellfish Bed Protection and Restoration. This was due to an apparent lack of a Shellfish Protection project which satisfied criteria number 3.
 2. All projects selected must have either an ongoing or completed status.
 3. Projects must be generally applicable to conditions present in Massachusetts Bay and/or Casco Bay.
 4. Sufficient information must be available to allow for a substantial project review and to support subsequent inquiries.
 5. There must be a mix of structural, non structural, and programmatic projects.
 6. Innovative and unique projects must be well represented.
 7. Projects should contain lessons to be learned for implementing the project elsewhere.
-

Every project selected did not necessarily meet all of the above criteria, however, projects which were most applicable and satisfied as many of the requirements as possible were chosen. In addition, a majority of the projects selected are ongoing projects. Therefore, more information will become available on these projects as they are completed.

SECTION II - PROJECTS OF INTEREST

PROJECTS OF INTEREST

This section contains the project summaries completed for the 29 projects of interest. Each summary includes a project description, a discussion of funding and management, the current project status, unique highlights including a discussion of the success or failure of the project, and references for further information. The summaries are organized by category as outlined in Table 2. The following projects are summarized in this section:

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STORMWATER CONTROLS

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Chesapeake Bay	Maryland Stormwater Quality Cost Share Program	51
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San Francisco Bay	Artificial Wetland Stormwater Control Project	57
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TOXIC WASTE REDUCTION

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WETLAND/HABITAT PROTECTION AND RESTORATION

Albemarle/Pamlico	Shoreline Erosion Control Demonstration Project	70
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Puget Sound	Local Government Wetland Preservation Program	76
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New Jersey Marine Debris Recycling Project

New York - New Jersey Harbor

Project Description

In the state of New Jersey, there has been a growing public concern over coastal water quality. In 1987 and 1988, reports of ocean pollution incidents and an increase in floating marine debris, especially plastic products, contributed to a \$600 million dollar loss in tourism revenues. To combat these problems, the New Jersey Department of Environmental Protection (NJDEP) has created several key programs. These include Operation Clean Shores, the Cooperative Coastal Monitoring Program, an anti-litter campaign, and helicopter surveillance of coastal waters. During implementation of these programs, it was found that a significant increase in public education on marine pollution was needed. Therefore, this project was undertaken to implement a one year pilot marine debris recycling program and strong public education effort at three selected marinas in New Jersey. These marinas were the Winter Yacht Basin in Ocean County, the Lincoln Harbor Yacht Club in Hudson County, and the Frank S. Farley State Marina in Atlantic City.

The marinas were selected based on the existence of pumpout and oil recycling facilities as well as past responsible environmental practices. The marinas ranged in size from 175 to 650 boat slips, and the amounts of traffic and solid waste operations were also varied. Only the Frank S. Farley Marina previously had a recycling arrangement in place.

At the beginning of the project in early spring, letters explaining the recycling project were sent with the slip rental bills to boaters at each of the trial marinas. A questionnaire was also enclosed to identify trash disposal habits at home and at the marina. Recycling containers and solid waste removal were provided free of charge by Ocean County for the Winter Yacht Basin. The Frank S. Farley Marina had their own receptacles and the Lincoln Harbor Yacht Club hired a private recycling company to collect and dispose of the materials. For this project, the materials being recycled were glass bottles, aluminum cans, plastic beverage containers, and newspapers.

In addition to the recycling containers, educational exhibits and information were put on display at each of the trial marinas. Literature on the problems of plastic in the water, oil recycling, safe boat paints, locations of NJ pumpout facilities, and the projects promotional stickers were provided. Colorful reflective road signs that read "This Marina Recycles!" were posted around the property of each marina. Large banners with the project logo and slogan were also flown. Cotton reusable tote bags were distributed to each boater in the program to be used instead of plastic bags for collection of recycling items on boats. Public service announcements by sports and movie celebrities were played throughout the summer on cable television stations in New York, New Jersey, and the Philadelphia area. All of these, and several other, multi media techniques were used to educate the public about ocean pollution and encourage participation in

the pilot recycling program.

Project Funding

This project was funded by a grant from the U.S. Environmental Protection Agency of \$71,000 to the New Jersey Department of Environmental Protection. The DEP then matched \$23,668 of that grant for a total project budget of \$94,668.

Project Management

Initially, meetings were held with staff of each of the participating marinas to seek their support and ask for feedback throughout the project. This initial step proved valuable in opening a dialogue with the project manager and marina workers.

A Task Force was established to provide advice, assistance, and feedback on the project. Members of the Task Force included representatives from the New York/New Jersey Harbor Project, NJ Marine Trade Association, NJ Sea Grant Marine Advisory Service, United Boatmen of NJ, Ocean County Department of Solid Waste, the Marine Bureau of the State Police, the U.S. Coast Guard, and the three marina operators. This group monitored the project's progress and gave recommendations that will aid future recycling programs throughout New Jersey.

Project Status

This was initially a one year project scheduled between November 1989 and November 1990. A six month extension was granted by the EPA to finish preparation and distribution of Marine Recycling Kits. The project was scheduled to be completed at the end of June 1991.

Project Highlights

Overall, this project was considered to be very successful by all the groups involved. A significant finding of this project was that a recycling program, no matter how well planned, needs a strong public education element to make it effective. Much was learned about which recycling techniques work best in a marina environment. A list of project experiences and suggestions for other programs has been compiled into a "How to Recycle at Your Marina " kit which is being distributed to all marina operators in New Jersey. In addition, a substantial list of recommendations is contained in the project final report document. Some of the more significant findings include:

- 1) Recycling compliance is greatly enhanced by public education material.

- 2) Dumpsters do not make good recycling containers because people deposit miscellaneous trash in them. Locating recycling containers away from trash receptacles works best as long as it is still convenient for the boaters.
- 3) Compliance is best when all recyclable materials can be placed in the same container, however, this is often unrealistic because of varied collection methods in different communities.
- 4) Keeping the marina staff informed of the project encourages support of the program and increases success.
- 5) An informative letter should be sent to each boater at the marina to inform them of the project and boost participation.
- 6) Posting signs, hanging banners, and using recycling stickers was found to be helpful in advertising the project and reminding boaters to recycle.

References/Contacts

New York - New Jersey Harbor Project. Pilot Project to Encourage Proper Handling of Marine Debris at a Series of Small Ports in New Jersey. Final Report. December 1990.

U.S. Environmental Protection Agency. NEP Update: NY-NJ Marine Debris Handling and Recycling, June 1990.

- . Mr. Seth Ausubel, EPA Region II. Telephone (212) 264-6779
- . Ms. Wendy Kaczerski, New Jersey DEP. Telephone (609) 633-7020

Marine Debris Demonstration and Education Project

Puget Sound

Project Description

The University of Washington's Sea Grant program set up a pilot marine debris recycling project in Squalicum Harbor in Puget Sound. The program was designed to reduce the amount of plastic and other debris that boaters were dumping into Puget Sound and to educate boaters about the problems of marine debris and its adverse effects on the environment and marine life.

The program was modeled after a similar program in Newport, Oregon, but it was modified to specifically target commercial fishermen in Squalicum Harbor and the gear they use such as wood, metal, lines, and nets. Fish carrying totes, four foot square by three feet deep were donated by local fish processing plants and used as the recycling containers. Each tote was washed, painted, and a chicken wire top was placed on each one.

The project was initially delayed six months due to lack of a committed advisory group and support from the agency responsible for the harbor. Once this obstacle was overcome, the project proceeded smoothly. The need for support from key persons within the affected organizations was a valuable lesson learned from the start up of this pilot program.

The materials recycled in this program were cardboard, aluminum, scrap metal, scrap wood, and nets. The recycling totes were placed at the head of each marina ramp within the harbor. Once fishermen and boaters began filling the totes with material, the project gained momentum and widespread support.

The second part of this project consisted of disseminating information about recycling marine debris. This was done with posters and information packets.

Project Funding

This project was funded by the Puget Sound NEP's Public Involvement and Education (PIE) Model Projects Fund. The original budget for this project was \$30,000. An additional \$5,000 grant was given to republish and distribute more literature from the project.

Project Management

This project was managed by the University of Washington's Sea Grant Program. The project staff was headed up by a coordinator from Sea Grant.

Project Status

This project has been completed. A successful recycling program is now in place at Squalicum Harbor in Bellingham.

Project Highlights

This project has succeeded in establishing a marine debris recycling program in Squalicum Harbor and in educating the public about marine recycling and the harmful effects of marine debris on aquatic life. As part of the educational phase of the project, 3,000 copies of a color poster about the Giant Pacific Octopus have been distributed. The posters are part of an information packet that has been developed for use by other marinas. The packet includes group specific brochures with marine recycling tips for commercial fishermen and recreational boaters.

Educational materials from this project have been distributed throughout the Sea Grant System. Marinas and other agencies from across the country have requested information about the project.

Upon seeing the success of the marine debris recycling program in Squalicum Harbor, the city of Bellingham initiated its own curbside recycling program.

References/Contacts

Puget Sound Water Quality Authority. PIE Model Projects Fund: 47 Success Stories From Puget Sound

• Mr. Michael Spranger, Washington Sea Grant. Telephone (206) 543-660044

Sediment Management Standards

Puget Sound

Project Description

Sediment samples collected in recent years from many locations within Puget Sound indicate that there is recent and ongoing toxic contamination present, particularly in urban bay areas. To address this issue, the Washington Department of Ecology has adopted a new regulation: Sediment Management Standards. The regulation became effective on April 27, 1991 and is one of the first sediment regulations to be established in the United States.

The new regulation has three key parts:

- 1) Sediment Quality Standards - standards have been developed that identify contaminated sediments that have adverse effects on marine life or pose a significant health risk to humans. Allowable concentration levels for the following 47 chemicals have been established:

Puget Sound Marine Sediment Quality Standards (ref4)

Chemical Parameter	mg/kg Dry Weight ppm (dry)
Arsenic	57
Cadmium	5.1
Chromium	260
Copper	390
Lead	450
Mercury	.41
Silver	6.1
Zinc	410

Chemical Parameter	mg/kg Organic Carbon (ppm Carbon)
LPAH	370
Naphthalene	99
Acenaphthylene	66
Acenaphthene	16
Fluorene	23
Phenanthrene	100
Anthracene	220
2-Methylnaphthalene	38

Chemical Parameter	mg/kg Organic Carbon (ppm Carbon)
HPAH	960
Fluoranthene	160
Pyrene	1000
Benz(A)Anthracene	110
Chrysene	110
Total Benzofluoranthenes	230
Benzo(A)Pyrene	99
Indeno(1,2,3-C,D)Pyrene	34
Dibenzo(A,H)Anthracene	12
Benzo(G,H,I)Perylene	31
1,2-Dichlorobenzene	2.3
1,4-Dichlorobenzene	3.1
1,2,4-Trichlorobenzene	.81
Hexachlorobenzene	.38
Dimethyl Phthalate	53
Diethyl Phthalate	61
Di-N-Butyl Phthalate	220
Butyl Benzyl Phthalate	4.9
Bis (2-Ethylhexyl) Phthalate	47
Di-N-Octyl Phthalate	58
Dibenzofuran	15
Hexachlorobutadiene	3.9
N-Nitrosodiphenylamine	11
Total PCB's	12

Chemical Parameter	ug/kg Dry Weight (ppb dry)
Phenol	420
2-Methylphenol	63
4-Methylphenol	670
2,4-Dimethylphenol	29
Pentachlorophenol	360
Benzyl Alcohol	57
Benzoic Acid	650

Sediments which are found to exceed the standard concentration level, are subjected to biological testing to determine if they cause adverse biological effects.

- 2) Source Control - the new regulation describes how the sediment quality standards will be used to control sediment contamination from ongoing, permitted sources. "Sediment Impact Zones" will be established in areas where dischargers are using the best available technological control but are still causing contamination in excess of the quality standards. The zones will permit the sediment quality standards to be exceeded to some degree but would also require additional information for the discharge permits, increase the sediment monitoring in the area, and require management of the sediment impact zone.
- 3) Sediment Cleanup - The new regulation has established a uniform set of guidelines for the decision process used in managing contaminated sediments. These guidelines are incorporated into the Sediment Management Standards rule and will be used to determine whether existing contaminated sediments should be capped, excavated, treated, or allowed to recover naturally. The sediment guidelines, outlined below, focus and direct all activities in the following stages of sediment management 1) site identification, 2) site screening, 3) site ranking according to human health risk, 4) site prioritization, and 5) selection of cleanup actions:

Outline of Sediment Cleanup Guidelines

- 1) The Puget Sound Water Quality Management Plan calls for contaminated sites to be identified by Urban Bay Action Teams as part of the overall management plan. Consequently, recommended guidelines for this stage of the process have not yet been developed.
- 2) The site screening step is conducted to identify sites where action should be expedited or deferred based on the site characteristics. A set of decision making guidelines has been recommended for both expedited and deferred action.
- 3) The purpose of step 3, the sediment ranking system, is to assess the relative hazard the contaminated sediments pose to human health and the environment. A finalized ranking process relative to human health risk is not currently available, however, a framework for the ranking system has been developed. Contaminated sediment sites that have been ranked are placed on a list in order of their hazard ranking. The list describes the current status of cleanup action at the site and is updated annually.
- 4) During site prioritization, the site rank scores and other information are evaluated. Site prioritization differs from site ranking in that administrative considerations are taken into account such as regulatory mechanisms, funding sources and action status. A stepwise mechanism for this prioritization process has been developed which takes into account these factors.
- 5) The evaluation of sediment cleanup actions is applied to all contaminated sediment sites according to their final priority rating. Cleanup action and remedy selection guidelines

have been developed which take into account source control activities, natural recovery and erosion control considerations, and appropriate remedial strategy selections.

The recommended guidelines mentioned above are discussed at length and are contained in the second reference document for this summary.

Project Funding

The proposed budget contained in the 1991 Water Quality Management Plan for the development of the Sediment Management Standards is \$418,934 for the 1991-93 biennium. The proposed budget for the development of the cleanup decision guidelines is \$70,771 for the same time period.

Project Management

The Sediment Management Standards regulation has been developed by the Washington Department of Ecology (DOE). The DOE conducted an extensive public involvement and technical development process for the regulation. Affected parties include ports, industry, federal and state agencies, and environmental groups. Implementation of the regulation will be assisted by an Implementation Committee. This committee will allow affected parties and the public to continue to be involved in the sediment management program.

Project Status

An Environmental Impact Statement, Responsiveness Summary, and Economic Impact Statement were completed during the development of the regulation. On March 5, 1991, the Washington Ecological Commission approved the regulation. The regulation became effective on April 27, 1991.

Project Highlights

Sediment remedial actions have already been implemented in the St. Paul Waterway, a designated "problem area" within Commencement Bay, a Superfund site adjacent to Puget Sound. The Superfund studies identified three potentially responsible parties. Two of these parties combined to fund remedial actions to clean up and control the contaminated sediments. Federal, State, and Local agencies as well as interested citizens were all involved in developing and overseeing the actions. The response actions at the St. Paul Waterway represent the first

approved and completed remedial actions at the site. In addition, the source controls being implemented in the Waterway are the first approved and completed source control actions at the Commencement Bay Superfund site.

References/Contacts

Puget Sound Water Quality Authority. 1991 Puget Sound Water Quality Management Plan.

Washington Department of Ecology. Recommended Guidelines for Contaminated Sediment Cleanup Decisions, Draft June 1989.

Washington Department of Ecology. Focus: Sediment Management Standards, March 1991.

Washington State Register, Issue 91-08, Chapter 173-204 WAC - Sediment Management Standards.

- Mr. Michael Wheeler, Puget Sound Water Quality Authority. Telephone (206) 493-9176

Dartmouth Water Quality Management Plan

Buzzards Bay

Project Description

Buzzards Bay is adversely impacted by various types of nonpoint source pollution, including stormwater runoff, failed septic systems, and boat wastes. In order to address this nonpoint source pollution in one subwatershed of Buzzards Bay, a water quality management plan is being developed by the Town of Dartmouth. The Town is preparing a water quality management plan for the Buttonwood Brook watershed, which is a tributary to Buzzards Bay. This water quality management plan is focusing on reducing nonpoint source pollution with the ultimate aim of reopening closed shellfish beds in the area of Dartmouth.

This project began with a shellfish inventory in Dartmouth to determine the value of the closed shellfish areas. In addition, land use maps were created to assist in locating potential nonpoint sources of pollution. From these maps, areas of potential nonpoint source pollution were delineated. This was followed by a water quality sampling effort in Buttonwood Brook which further isolated potential high pollution areas. In addition to this focus on land use within the Buttonwood Brook watershed, the project also involved a review of regulations in the Town of Dartmouth pertaining to water quality issues. This review included wetlands regulations, zoning bylaws, subdivision regulations, and septic system requirements. From this review, and the data obtained during the land use study and water quality sampling efforts, recommendations for improved protection of Buttonwood Brook will be formulated. These recommendations will focus on reducing pollutant inputs to Buttonwood Brook through the use of nonstructural zoning restrictions, improved wetland regulations, and stricter subdivision requirements. To date, these recommendations have not been made.

Funding Sources

This project is funded by the Buzzards Bay Project, the NEP agency for Buzzards Bay, through its Municipal Grants Program. In this program, the Buzzards Bay Project provides a yearly sum of money to fund action/demonstration projects within the Buzzards Bay watershed. Municipalities can propose projects to be funded under this program, and proposals are reviewed by the Buzzards Bay Project for their appropriateness for funding. In some instances, communities are required to provide some additional funding for these projects. However, this project was completely funded by a Municipal Grant for \$13,200.

Project Management

This Water Quality Management Plan is being developed by the Town of Dartmouth, with oversight being provided by the Buzzards Bay Project.

Project Status

This project is under way but has not reached completion. The shellfish inventory, land use mapping, potential nonpoint source delineation, and water quality sampling efforts have all been completed. Currently, the water quality regulations review is under way and will be followed by the development of recommendations. A final report, including the actual water quality management recommendations, is expected by the end of November, 1991.

Project Highlights

This project is being conducted principally at the municipal level with oversight by the Buzzards Bay Project. The experience gained in this project can be used to produce similar water quality management plans throughout the Buzzards Bay and Massachusetts Bay watersheds. Also, this project is an example of a successful program funded by the Buzzards Bay Municipal Grants Program. This program has been successful at providing funding for locally conducted projects throughout the Buzzards Bay watershed. More specific results will probably be available upon completion of the municipal regulation review and nonpoint source control recommendations. Since many of the communities in the Buzzards Bay watershed have similar regulatory powers, the findings of this portion of the study will have impacts outside of the Buttonwood Brook watershed.

References/Contacts

For further information concerning this project, please contact

- Mr. David Janik, Buzzards Bay Project, 2 Spring Street, Marion, MA 02738. Telephone (508) 748-3600.
- Dr. Joseph Costa, Buzzards Bay Project, 2 Spring Street, Marion, MA 02738. Telephone (508) 748-3600.
- Mr. Michael Gagne, Town of Dartmouth, 400 Slocum Road, Dartmouth, MA 02747. Telephone (508) 999-0713.

Land Management Project

Narragansett Bay

Project Description

The Land Management Project (LMP) is a non-regulatory companion organization of the Narragansett Bay Project (NBP). It is a resource organization for use by local and state land management personnel, and its purpose is to provide assistance to communities on effective land use and nonpoint source management techniques. The assistance provided includes:

1. helping communities implement growth strategies that are both protective of vital resources and fiscally responsible;
2. developing land management ordinances to be used as models for local communities;
3. providing technical reviews of local land management projects and plans;
4. conducting evening in-town conferences for local community boards, commissions, and residents on land use management and development techniques;
5. holding a variety of technical conferences on watershed management, planning, and financing issues for environmental professionals and the design community;
6. publishing fact sheets on land use-water quality relationships, planning tools, and a broad range of specific structural and non-structural BMPs applied to nonpoint source pollution management.

The technical assistance provided by the LMP is in response to Rhode Island's two year mandatory comprehensive planning process which requires each city and town to develop a comprehensive local land management plan.

In addition to the technical assistance provided to local communities, the LMP project staff works with designers to showcase specific site designs, landscaping techniques, and use of BMPs to control nonpoint source pollution to Narragansett Bay. Slides of example projects in Rhode Island and in other regions of the U.S. are available for use in technical presentations. Guided field tours of demonstration projects are also offered.

Project Funding

This project is jointly funded, as an action plan through the Narragansett Bay Project, by the U.S. EPA and the Rhode Island DEM. The original project grant was for \$150,000 in July of 1988. Additional monies totalling \$66,886 have been provided by the NBP, one for \$36,866 in November of 1989, and one for \$30,000 in April of 1990. The LMP is now awaiting the approval of another \$50,000 grant from the NBP to extend the project.

Project Management

The Land Management Project is housed in the Office of Environmental Coordination of the Rhode Island Department of Environmental Management (RIDEM), and works closely with the RIDEM Nonpoint Source Program staff. General project supervision is provided by the NBP, and its Land Use Subcommittee, which includes state and local government professionals and academics. The full-time staff includes a senior professional environmental scientist and one professional planner, with intern and consultant support.

Project Status

The LMP was created in December, 1988 with a projected two-year Action Plan time-table, and has been extended due to the lengthened duration of the state comprehensive planning process. Pending additional funding by the NBP, the project could be extended into December of 1991.

Project Highlights

The LMP has aggressively pursued the results of projects emerging throughout the U.S. on land use-water quality relationships and innovative growth management and nonpoint source control techniques. Because of this, the LMP has had the opportunity to synthesize research results for a wide audience and to offer new unbiased information on emerging and controversial land use issues to a broad range of organizations. These research results are disseminated to interested parties through workshops, conferences, educational materials, and technical guidance.

Communities have taken advantage of the technical assistance being provided by the LMP as evidenced by the in-town workshop series which has been conducted in all 39 cities and towns in the State of Rhode Island. In addition, seven technical conferences have been held throughout the State with nationally and regionally recognized speakers. These conferences have been attended by interested personnel from throughout New England.

References/Contacts

Narragansett Bay Project. Scope of Work: Land Management Project, Work element #9.

- Mr. Terence Whalen, Water Resources Specialist, Land Management Project. Telephone (401) 277-2776
- Ms. Jennie Meyers, Director - Land Management Project. Telephone (401) 277-2776
- Ms. Caroline Karp, Director - Narragansett Bay Project. Telephone (401) 277-3165

Nonpoint Source Control Demonstration Project

Buzzards Bay

Project Description

Coastal areas in Massachusetts, including Buzzards Bay, have been experiencing significant decreases in available open shellfish beds in recent years. Much of the problem has been traced to fecal coliform contamination resulting from nonpoint source pollution (MADEP, 1990). In this project, the Commonwealth of Massachusetts provided technical assistance to local communities developing nonpoint source control plans by developing two nonpoint source control management plans and developing a guidance document outlining a methodology for developing these management plans.

In this project, the Massachusetts Department of Environmental Protection, through a contract with Metcalf & Eddy, Inc, prepared a nonpoint source guidance document for local officials to assist them in developing nonpoint source management plans. This document outlines a methodology for assessing and addressing nonpoint source pollution with an emphasis on the types of pollution sources found in Massachusetts coastal communities. However, much of the information contained in this document could be used by inland communities interested in protecting lake and river resources. The methodology outlined in the guidance document includes information on reviewing environmental data, evaluating affected resources, identifying and ranking pollution sources, identifying and evaluating potential best management practices, and developing plans to control priority sources. This document has been sent to many communities throughout Massachusetts, as well as agencies in other states.

As a part of this project, two nonpoint source management plans were developed for the Towns of Westport and Bourne, Massachusetts. These demonstration projects investigated both structural and nonstructural best management practices to reduce pollutant discharge to shellfish resources. Pollutant sources included stormwater runoff, agricultural runoff, septic systems, and industrial/commercial land uses. The development of these plans assisted in the development of the subsequent guidance document which outlines the process used during these projects.

Funding Sources

The development of the document "Nonpoint Source Control: A Guidance Document for Local Officials" was funded by the Massachusetts Department of Environmental Protection, Division of Water Pollution Control. Funding for the development and distribution of the document was approximately \$130,000.

Project Management

Primary oversight for this project was provided by the Massachusetts Department of Environmental Protection, Division of Water Pollution Control, Research and Development Program. Through this project, an advisory committee was developed which included representatives of the Buzzards Bay Project, Massachusetts Coastal Zone Management, USEPA Region I, the Soil Conservation Service, the Southeast Regional Planning and Economic Development District, and various citizens' groups from Westport and Bourne, Massachusetts.

Project Status

The nonpoint source control document was completed in February 1990 and has been distributed to communities in Massachusetts and agencies in other states. The reaction to this document has been generally favorable. However, it is not known if any communities have utilized the methodology outlined in the document to develop nonpoint source management plans.

Project Highlights

The process for conducting this project included the development of two demonstration nonpoint source management plans for the Towns of Bourne and Westport. These demonstration projects were conducted prior to the development of the guidance document. Therefore, the process described in the guidance document was developed through these demonstration projects. Conducting these demonstration projects was important to the overall development of the guidance document, since they provided opportunities to develop the methodology prior to writing the guidance document.

In addition to providing education for participating local officials, the development of specific nonpoint source management plans for Bourne and Westport allowed for interaction between various local officials, state agencies, and citizens' groups in the Buzzards Bay watershed.

References/Contacts

- Mr. George Kretas, Massachusetts Department of Environmental Protection, Division of Water Pollution Control, Research and Development Program. Telephone (508) 366-9181.
- Mr. Bob Kubit, Massachusetts Department of Environmental Protection, Division of Water Pollution Control, Nonpoint Source Program. Telephone (508) 366-9181.

Coalition for Buzzards Bay/Buzzards Bay Advisory Committee

Buzzards Bay

Project Description

Like other programs within the National Estuary Program (NEP), the Buzzards Bay National Estuary Program (BBP) established a Citizen's Advisory Committee (CAC). Early in the development of this structure for the program, participants in the CAC realized that this group could be more effective in their efforts to raise public awareness of issues in the Bay if they were divided into two separate organizations. These organizations represent the two major constituent groups within the BBP: the general public and local officials. The BBP provided seed money to create the Coalition for Buzzards Bay (CBB) which would act as the voice of citizen organizations and the general public. In addition to this group, the BBP has also developed an organization of local town officials initially called the Buzzards Bay Advisory Committee, now known as the Buzzards Bay Action Committee (BBAC). This entity serves to advise the BBP regarding the development and implementation of the CCMP for the Bay.

Today, the CBB has become an independent group that works to increase the awareness of citizens and communities surrounding the Bay about water quality and land use in the area. It is an independent non-profit organization which has grown to over 600 members from research institutions, businesses, citizen and environmental organizations, and the general public. The CBB concentrates its effort on informing people about the practical ways in which they can contribute to a healthier and safer environment. The CBB produces fact sheets, conducts public education programs, issues environmental report cards for watershed communities, and holds forums on issues such as oil spill response and zoning variances.

The BBAC received start up funding from the BBP to hire an executive director. The BBAC is responsible for:

- 1) Taking regional water quality concerns down to the local level.
- 2) Keeping local boards aware of the technical assistance available through the Massachusetts Coastal Zone Management Office.
- 3) Helping Buzzards Bay communities solicit funds for pollution control projects.
- 4) Serving as a political force for funding of local projects.

One of the BBAC's accomplishments was the establishment of a Municipal Grants Program. This is a program designed to fund local pollution control projects in the Buzzards Bay watershed. In this program, communities send proposals for local projects, and the BBAC awards funds to implement the projects. Seven separate demonstration projects totalling \$100,000 were funded through the Municipal Grants Program in its first year alone. These seven projects are listed in Section III as demonstration projects within this report. In addition to the establishment of the Municipal Grants Program, the BBAC's most significant accomplishment has been the

signing of the Buzzards Bay Compact by all communities within the Buzzards Bay watershed. This Compact represents the local community's commitment to implement the recommendations of the CCMP.

Funding Sources

The BBAC received funding from the BBP to hire an executive director and to develop the Municipal Grants Program, which is administered by the BBAC. However, the CBB is an independent, non-profit organization which does not receive funding from the BBP. All funds required by the CBB are raised through memberships and corporate and individual donations. In addition to money raised through its membership, the CBB also receives funds from the BBP for conducting specific tasks.

Project Management

The BBAC has a full time executive director and membership consisting of local officials from communities within the Buzzards Bay watershed who are selected by the community selectmen or mayor. Members of the BBAC include area health officials, regional planners, and members of municipal boards. The CBB has two full time staff members and a board of directors elected by the full membership. The staff is responsible for publishing monthly newsletters and conducting public education.

Project Status

The BBAC is an active organization within the BBP and holds monthly meetings to develop and now implement the recommendations of the CCMP. Since its initial establishment in 1987, the CBB has become an independent non-profit organization.

Project Highlights

The development of the BBAC and the CBB have greatly helped the Buzzards Bay Project in the development of goals and communication of these goals to the general public and the local municipalities.

The BBAC has successfully overseen the dissemination of funds from the Municipal Grants Program. This program has been very successful at funding local demonstration projects throughout the Buzzards Bay watershed. The funded projects include stormwater controls, septic system studies, land use planning efforts, and watershed management plans. In addition to the Municipal Grants Program, the BBAC has been successful at getting the Buzzards Bay

communities to sign the Buzzards Bay Compact. This Compact is vital to the implementation of recommendations within the CCMP.

The CBB has been able to take the seed money given by the BBP in 1987 and become an independent non-profit organization. Therefore, they no longer have to rely on funding from the BBP to remain an effective organization. The fact that the CBB has been able to successfully fund their own programs demonstrates the commitment of local citizens to the improvement of water quality in Buzzards Bay. In addition to projects conducted with CBB funds, additional specific projects are conducted by the CBB through funding from the BBP.

Contacts/References

For further information regarding the BBAC or CBB, please contact the following:

- Mr. Dennis Luttrell, Executive Director BBAC, Buzzards Bay Project, 2 Spring Street, Marion, MA 02738. Telephone (508) 748-3600.
- Ms. Marion McConnell, Coalition for Buzzards Bay, P.O. Box 268, Buzzards Bay, MA 02532. Telephone (508) 759-5761 EXT 334.

Local Government Committee

Delaware Estuary Program

Project Description

In an attempt to increase local government involvement in the Delaware Estuary Program (DELEP), the Local Government Committee (LGC) was created. The purpose of the LGC is to provide advice and recommendations to the DELEP Management Committee, to provide coordination with local governments, and to assist in the development and implementation of the Comprehensive Conservation and Management Plan (CCMP). In support of this, the LGC is tasked with:

1. disseminating information about the DELEP to local governments;
2. communicating local government programs and initiatives to the DELEP;
3. reviewing local government efforts in view of the goals set by the CCMP;
4. advising the management committee in the development of annual reports;
5. advising the management committee in the development of annual workplans and budgets;
6. advising the management committee on required changes concerning federal, state, and local regulatory and monitoring efforts;
7. advising the management committee on required changes concerning land use programs, authorities and initiatives;
8. directing funding expenditures for local government projects;
9. coordinating local government involvement in the DELEP.

The Local Government Committee works closely with the Public Participation Task Force, especially in the development of programs for the Legislative Liaison Program. In addition, the LGC oversees the development of reports and projects related to local government involvement in the DELEP. For example, the LGC oversaw the development of an issues paper looking into options for implementing land use management and nonpoint source control for the Delaware Estuary.

The LGC also acts as an organization to bring together the diverse people involved at the local level throughout the Delaware Estuary watershed, including people from three different states: Delaware, New Jersey, and Pennsylvania.

Project Funding

The LGC is part of the DELEP Management Committee and receives funding from the general DELEP budget. Funding in the first year of the LGC included \$65,000 for two projects: a local land use management inventory and assessment; and a federal, state, and local

regulatory/monitoring program inventory and assessment.

Project Status

The LGC was created by the management conference in 1989 and has been ongoing since its creation.

Project Management

The LGC does not have any full time staff. Its membership is composed of representatives of local governments, county planning commissions, county conservation districts, Coast Guard, and other appropriate groups and organizations. The committee membership is limited to 33 members with decisions being made by consensus. Members of the LGC must:

1. be potentially affected by the recommendations contained in the CCMP;
2. be willing to assume responsibility for communicating with a local government or appropriate government agency and attend regular meetings;
3. have knowledge and interest in Delaware Estuary water quality and resource management issues;
4. be within the impact area of the program.

Project Highlights

The LGC has only been functioning within the DELEP since 1989 but has already begun funding and overseeing projects at the local level. The local land use and regulatory programs are progressing under the direction of the LGC. In addition to these projects, the LGC is also responsible for participating in the Legislative Liaison Project and the Constituent Group Conferences. These projects involve getting local government officials and citizens together to address issues regarding Delaware Bay. These projects have been successful at developing interest in the work of the DELEP.

Because the Delaware Bay watershed includes three states: Delaware, New Jersey, and Pennsylvania, the LGC includes members from all three states. This organization has been valuable for bringing together representatives of these three states to address the water quality issues of Delaware Bay.

Contacts/References

Delaware Estuary Program Local Government Committee Bylaws, Revised Nov. 1989. Available from the Department of Environmental Resources, Division of Coastal Zone Management, P.O. Box 1467, Harrisburg, PA 17120.

- Mr. Steve Feltenberger, DELEP Assistant State Program Coordinator, P.O. Box 8761, Harrisburg, PA 17105-8761. Telephone (717) 541-7808.

Interagency Technical Assistance Teams

Puget Sound

Project Description

The Puget Sound Nonpoint Source Action Plan calls for the development of watershed management committees within each priority watershed in the Puget Sound Region. The committees are made up of representatives from local, state, and federal agencies, as well as watershed residents and affected parties. These watershed management committees are responsible for developing a watershed action plan for their area. The action plans define goals and objectives, define problems, characterize water quality, and provide a budget for pollution control and implementation strategies.

Two technical assistance teams have been established as part of the Puget Sound Nonpoint Source Action Plan to aid local watershed committees in developing their watershed action plans. These teams are the Interagency Technical Assistance Team (ITAT) and the Puget Sound Cooperative River Basin Study Team.

In 1987 the Department of Ecology formed the ITAT. The ITAT is made up of members from the Departments of Ecology, Health, Wildlife, Fisheries, Natural Resources, Agriculture, the PSWQA, and other state environmental agencies. Individuals participate on the ITAT over and above their normal duties at their respective agencies. Team members are responsible for tracking development and implementation of watershed action plans in their areas of technical expertise. They provide technical assistance to watershed committees throughout the watershed planning process and coordinate technical assistance between their agency and other agencies. Members participate in watershed plan reviews and serve as the contact at their respective agencies.

The Cooperative River Basin Study Team is a joint project between the Soil Conservation Service, Forest Service, and the Departments of Ecology and Fisheries. This technical assistance team functions similarly to the ITAT by providing assistance to watershed management committees. The team provides a report with its recommendations to the local watershed action committee. This team has had great success and has been very well received by local people within the watersheds.

Project Funding

Funding for the teams comes from the state general fund. Individual agencies provide funding for one or more individuals to serve on the teams. Team members participate in the project in addition to their normal work responsibilities.

Project Management

The assistance teams do not have a rigid management structure. The ITAT has a coordinator who manages the team. The Cooperative River Basin Study Team has a team leader at the Soil Conservation Service.

Project Status

This project has been ongoing for three years.

Project Highlights

The ITAT and Cooperative River Basin Study teams have been successful in aiding local management committees in preparing their watershed action plans. The ITAT has been able to facilitate a statement of concurrence process which commits agencies to carry out their responsibilities within the action plans.

References/Contacts

Puget Sound Water Quality Authority. 1991 Puget Sound Water Quality Management Plan.

- . Mr. Ken Stone, Washington State Department of Ecology. Telephone (206) 438-7073

Buttermilk Bay Nitrogen Overlay Project

Buzzards Bay

Project Description

Studies of Buzzards Bay have shown that excessive nitrogen loading to the Bay has resulted in water quality degradation. This nitrogen loading results from both point and nonpoint sources of contamination. However, within the Buzzards Bay watershed, the nitrogen loading is primarily from nonpoint sources such as lawn fertilization and septic systems (BBP, 1990). As a first step, a methodology for reducing nitrogen loadings from these sources was developed and implemented in three communities in the Buttermilk Bay watershed: Wareham, Bourne, and Plymouth.

As a first step, the current and future expected loadings of nitrogen to Buttermilk Bay were determined and compared to the acceptable nitrogen loading rate developed by the Buzzards Bay Project for the Bay. Based on this comparison, zoning density was decreased to maintain nitrogen loadings below the acceptable level. The process for conducting this project included delineating the tributary area of Buttermilk Bay, studying the Bay's flushing patterns and rates, calculating acceptable yearly nitrogen loadings, calculating future nitrogen loadings at maximum buildout, comparing the expected future load to the acceptable loading rate, and developing plans to restrict future development so that nitrogen loading will remain below the acceptable level. This study concentrated on the Buttermilk Bay watershed which includes portions of the towns of Bourne, Plymouth, and Wareham. The recommendations for these communities focused on restricting future development through zoning to prevent the watershed nitrogen loadings from exceeding the acceptable total load calculated for Buttermilk Bay.

Funding Sources

This project was funded by the Buzzards Bay Project through Massachusetts Coastal Zone Management and the U.S. Environmental Protection Agency. Total funding for this project was approximately \$35,000.

Project Management

This project was overseen and conducted by the Buzzards Bay Project. Assistance in calculating the acceptable yearly nitrogen loadings to Buttermilk Bay was provided by the Woods Hole Oceanographic Institute.

Project Status

All work on this project has been completed, and the study recommendations have been adopted by the towns of Bourne, Plymouth, and Wareham through town meeting votes on zoning articles. The articles passed nearly unanimously in all three communities. Therefore, all three communities now have zoning regulations which consider total nitrogen loading to Buttermilk Bay.

Project Highlights

The Buzzards Bay Project has estimated acceptable nitrogen loading rates for this class of embayment that may be applicable in other similar embayments. The methodology for calculating current and expected nitrogen loads from developments is also applicable nationwide. The management recommendations are Buttermilk Bay specific, and similar recommendations may or may not be appropriate for other embayments.

In this project, the acceptable nitrogen loading level was found to be significantly lower than the expected nitrogen loading level at full development. However, it was greater than the existing nitrogen loading. Therefore, future protections were instituted. If current loadings had already exceeded the acceptable loading, more costly and extensive solutions would have been required.

One of the important lessons to be learned from this project is that cooperation at the municipal level is required in order to implement this type of project. In this case, the three affected communities, Bourne, Plymouth, and Wareham, cooperated during the project, and they also passed local regulations once the project was complete. If one or more of the three communities did not participate in this effort, the protection afforded Buttermilk Bay would likely have been inadequate.

References/Contacts

For further information regarding the Buttermilk Bay Nitrogen Overlay Project please contact the following:

- Mr. David Janik, Buzzards Bay Project, 2 Spring Street, Marion, MA 02738. Telephone (508) 748-3600.
- Mr. Bruce Rosinoff, Buzzards Bay Project, 2 Spring Street, Marion, MA 02738. Telephone (508) 748-3600.

Maryland Agricultural Cost-Share Program

Chesapeake Bay Program

Project Description

The Maryland Agricultural Cost-Share Program (MACS) was created in 1983 and provides financial assistance to farmers who install agricultural best management practices (BMPs) to solve water quality problems. Under this program, farmers can receive up to 87.5 percent of the cost of installing approved BMPs to control water quality problems. The agricultural activities eligible for funding under MACS include croplands, orchards, animal feedlots, grazing land, and poultry operations. BMPs that are eligible for funding under this program include those dealing with cropland protection, permanent vegetative cover, grazing land protection, water protection, water control, and animal waste control. In this program, 24 priority watersheds have been set aside to receive 75 percent of the funding allocated. Many of these watersheds fall under the Chesapeake Bay watershed.

Under this program, farmers file for approval of funding with the Maryland Department of Agriculture (MDA) Soil Conservation District (SCD). In many cases, the SCD assists farmers in the development of applicable BMPs and cost estimates for the specific problems experienced on the farm. After approval of the application, the MDA drafts up a cost-share agreement which requires the farmer to complete construction of the proposed BMP within one year and within the allowed funding. Funding is determined by set rates developed for different BMPs by the Soil Conservation Service (SCS) and MDA. Farmers must stay within this set cost estimate. In addition to the funding given for design and construction of agricultural BMPs, the SCD and MDA monitor the effectiveness and maintenance of the installed BMPs. If this monitoring turns up violations of set maintenance procedures, the Secretary of Agriculture can request legal action be taken against the offending farmer. These monitoring reviews are performed by the SCD on approximately ten percent of the installed practices annually.

Participation in this program by Maryland farmers is voluntary. The program is promoted by SCD employees, who visit area farms on a regular basis. Also, newsletters, mailings, and radio farm shows are used to introduce the program to area farmers.

Project Funding

The funding for the MACS Program began with a bond issue from the Maryland State Legislature for \$32.7 million and a \$5.5 million grant from the Chesapeake Bay Program. Approximately \$22 million worth of projects have been completed to date with an annual average of \$3.7 million per year over the last three years. Funding for the 1990-1991 program was \$4.05 million. In this program, 75 percent of the total funds allocated by the State Legislature each year are earmarked for use in priority watersheds throughout the State.

However, funds can be transferred among priority watersheds or from priority watersheds to non-priority watersheds if application rates warrant.

Project Management

The MACS program is overseen by the MDA. The SCD receives and reviews applications for funding under this program. They also provide technical assistance in completing applications and developing BMP plans. These plans are approved or rejected by the MDA. Also, all three departments provide ongoing technical assistance and maintenance monitoring for installed BMPs.

Project Status

The MACS Program began in 1983 and has continued for the last eight years. During this time, over 7,400 BMP applications have been received by the MDA. Of these applications, over 5,200 BMP projects have been implemented. Over 2,000 proposed projects have been ruled ineligible by the program or withdrawn or canceled by the applicant.

Project Highlights

This program has been very successful at funding local agricultural BMP projects through the State of Maryland and the Chesapeake Bay watershed. The methods for disseminating information about the program have been successful in reaching the target audience. The large number of requests for funding under this program (781 applications during the 1990-1991 year) have all been able to be assessed based on their applicability to the goals of the program. To date, no application for installation of a BMP to remedy a critical condition has been rejected for lack of funds.

Through conducting this program, certain characteristics of a successful agricultural cost share program have been isolated. These characteristics include:

- 1) Motivated and well-trained local staff at the Soil Conservation District level;
- 2) Development of standard BMPs that are pre-approved for funding through the program;
- 3) Proper determination of eligibility criteria;
- 4) Selection of priority watersheds within the State;
- 5) Restrictions on the time frame under which BMPs can be implemented while still being eligible for funding;
- 6) Required maintenance with enforcement powers;
- 7) Active promotion of the project by local committees;
- 8) Voluntary participation in the program by area farmers;
- 9) Strong educational aspect which teaches farmers about the cost-effectiveness of BMPs.

These lessons and others are contained in an EPA publication which outlines successful agricultural water quality cost share programs in Idaho, Iowa, Maryland, North Carolina, and Wisconsin entitled "Share the Cost/Share the Benefit: Agricultural Water Quality Cost-share Programs."

Contacts/References

. Mr. Gould Charshee, Maryland Department of Agriculture. Telephone (301) 841-5864.

US EPA Office of Policy and Planning. Share the Cost/Share the Benefit: Agricultural Water Quality Cost-share Programs. 1990.

Sarasota Wastewater Reclamation Project

Sarasota Bay

Project Description

Historically, the City of Sarasota's wastewater treatment facility (WWTF) discharged secondary effluent to Whitaker Bayou. This discharge was contributing significant levels of nutrients to the bayou and Sarasota Bay. In the early 1980's, the City of Sarasota made a commitment to eliminate discharges to the bayou except during wet weather. As a result of this commitment, the City began a program to reuse the treated effluent.

Prior to the initiation of the reuse program, the Sarasota WWTF discharged approximately seven to eight million gallons per day (MGD) of treated wastewater to the bayou. To date, the City has located and developed contracts for two wastewater reusers: the city golf course and a nearby cattle ranch. Bobby Jones Golf Course utilizes approximately 0.5 MGD of treated wastewater for irrigation, and the Hi-Hat Ranch utilizes approximately four MGD of treated wastewater to irrigate pasture land through a ridge and furrow system. The City is attempting to develop other reuse contracts with area golf courses, ranches, and citrus growers. By the end of 1992, the City hopes to have reuse contracts to cover the eight MGD of treated wastewater discharged by the WWTF.

In addition to developing these reuse contracts, the City has also upgraded the WWTF to provide advanced treatment of flows currently being discharged to Whitaker Bayou. With the current reuse contracts and the advanced treatment of flows to Whitaker Bayou, it is estimated that nitrogen discharges have been reduced by approximately 80 percent. By the end of 1992, the City hopes to develop additional reuse contracts to completely eliminate dry weather discharges from the WWTF. Under these conditions, it is estimated that nitrogen discharges could be reduced by an additional 95 percent.

Project Funding

Total funding for this project dates back to the early 1980's with the City's commitment to eliminate dry weather discharges to Whitaker Bayou. Since that time approximately \$40 million has been spent on plant improvements, land purchases, and irrigation and water storage facility construction. Of this total, approximately \$15 million has come from federal and state grants, with the balance being contributed by the City of Sarasota.

Project Management

This project is being conducted by the City of Sarasota Department of Public Works with technical assistance from the State of Florida and the Sarasota Bay National Estuary Project.

Project Status

This project began in the early 1980's and is going to continue until at least the end of 1992. At that time, the City of Sarasota should have enough reuse contracts developed to completely eliminate dry weather discharges to Whitaker Bayou.

Project Highlights

The decision to eliminate dry weather discharges to Whitaker Bayou from the Sarasota WWTF was made by the City of Sarasota in the early 1980's. Since that time, the City has tried to meet that goal. However, there have been difficulties primarily related to developing reuse contracts. The City has experienced difficulties in finding suitable and willing purchasers for the treated effluent. Part of this difficulty results from a lack of incentives for agricultural activities to utilize treated effluent. The State of Florida has set restrictions on the amount of groundwater that can be pumped by golf courses for irrigation. Therefore, golf courses have been generally receptive to the use of the treated effluent, since this provides them with a constant supply of irrigation water that is not as restricted as groundwater. However, agricultural uses of groundwater are not restricted. Therefore, there is much less incentive for ranches or citrus growers to utilize the treated effluent. Finding agricultural users for the discharges is one of the most difficult aspects of this wastewater reuse project.

The City's attempt to implement this program has caused some legal difficulties. The original goal of no dry weather discharges to Whitaker Bayou by the end of 1992 has been written into the WWTF's permit. Because of non-backsliding requirements, the City of Sarasota is now committed to fully implementing wastewater reuse by 1992. If suitable contracts can not be developed by that time, they will be in danger of violating their permit conditions. Therefore, even though the City of Sarasota originally developed goals beyond those required by law, they are now committed to meeting those goals. The City of Sarasota still sees wastewater reuse as a valuable goal. However, the pressure of meeting deadlines which were originally self-imposed was not foreseen in the early 1980's when the goal was developed.

Other than the difficulties experienced in developing reuse contracts, the wastewater reclamation project has been successful. The reusers currently under contract have been able to successfully use the treated effluent as irrigation water. In fact, the Hi-Hat Ranch, a current user of four MGD, is planning to expand use of the effluent. There are plans to add an additional 1500 acres of pasture land to that already being irrigated by the treated effluent as well as a large citrus grove.

References/Contacts

- Mr. Doug Taylor, City of Sarasota, Department of Public Works. Telephone (813) 955-2325.

Septic System Model Health Regulations

Buzzards Bay

Project Description

Studies undertaken by the Buzzards Bay Project (BBP) indicate a number of sources of pathogen contamination, including septic systems, stormwater runoff, sanitary waste discharges from marine craft, municipal wastewater discharges, waterfowl, and wildlife. This project addresses the issue of pathogen contamination from septic systems in the Buzzards Bay watershed.

Septic systems are an important mode of wastewater disposal for most of Buzzards Bay, and studies conducted by the Buzzards Bay Project have indicated that on-site wastewater disposal systems are a source of pathogen contamination to Buzzards Bay. Pathogen contamination has been responsible for the closure of many acres of shellfish beds in the Bay. Therefore, in this demonstration project, the Buzzards Bay Project, the NEP agency in Buzzards Bay, investigated various methods to reduce pathogen contamination of the Bay from on-site wastewater disposal systems.

The Commonwealth of Massachusetts has set regulations for the design of on-site wastewater disposal systems (Title 5). These regulations represent minimum requirements to protect groundwater and surface water resources. These regulations specify certain setback distances for septic systems from surface waters, wells, and water supply lines, as well as required soil percolation rates and vertical depth to groundwater. However, because Title 5 is a state minimum code and the Buzzards Bay watershed has some unique characteristics, Title 5 regulations may not be stringent enough to provide surface water protection.

In this demonstration project, the Buzzards Bay Project developed more stringent model supplements to Title 5 that could be adopted by individual municipalities within the Buzzards Bay watershed. These model supplements to Title 5 include requirements for septic system construction, criteria for determining septic system repair and replacement, real estate transfer septic system inspection, and septic system additives and cleaners. Supplements were drafted and then reviewed by local health agents and appropriate state agencies. Follow-up was provided to further explain the supplements and assist with implementation activities.

Also as part of this demonstration project, a public outreach campaign was conducted to educate homeowners about the proper operation and maintenance of on-site wastewater disposal systems. This education campaign included distributing pamphlets and focused on education related to proper pumping frequencies for on-site systems and disposal of household hazardous wastes.

Funding Sources

This demonstration project was primarily funded by the Buzzards Bay Project with recipients contributing a minimum cost share of 25%. Total funding for this project was approximately \$26,000. Of this funding, approximately \$20,000 was used to develop the model supplements to Title 5.

Project Management

The model supplements for this project were developed by the Barnstable County Health Department with technical assistance from the Buzzards Bay Project. The public education was conducted by the Coalition for Buzzards Bay also with assistance from the Buzzards Bay Project. Periodic review was conducted by Massachusetts Coastal Zone Management, and the Massachusetts Department of Environmental Protection.

Project Status

All tasks under this project have been completed. The model supplements to Massachusetts Title 5 have been developed and have been implemented in the community of Barnstable, which is in the Massachusetts Bay watershed not the Buzzards Bay watershed. Also, the public education program is an ongoing project.

Project Highlights

This project deals directly with the Commonwealth of Massachusetts on-site wastewater disposal regulations (Title 5), and, therefore, has applicability throughout the Commonwealth of Massachusetts. The model supplements to Title 5 developed under this project have been passed in Barnstable and could be passed in other Buzzards Bay communities. The Buzzards Bay Project is attempting to convince some of these other communities to pass these supplements.

A by product of this project was the involvement of local officials in the development of the model supplements. Through this process, local officials could be given technical assistance in implementing the model ordinances. Prior to the development of these model supplements, local officials were aware of their power to implement stronger regulations than those specified by Title 5. However, they did not feel they had adequate technical assistance to develop the stronger regulations.

The educational portion of this project is on-going and includes other aspects besides those related to on-site wastewater disposal systems. The educational programs also included information for boat owners on the proper disposal of on-board wastes. These different educational goals were combined into this one program.

References/Contacts

For further information regarding the Buzzards Bay Septic System Management Demonstration Project please contact the following.

- Mr. David Janik, Buzzards Bay Project, 2 Spring Street, Marion, MA 02738. Telephone (508) 748-3600.
- Mr. George Heufelder, Barnstable County Health Department. Telephone (508) 362-2511 EXT 331.

Legislative Liaison Project

Delaware Estuary Program

Project Description

The Delaware Estuary Program's (DELEP) Public Participation Task Force (PPTF) and Local Government Committee (LGC) have set up the Legislative Liaison Program in order to raise awareness of Bay issues among federal, state, and local officials. The primary function of the project is to organize annual Legislative Conferences for government officials throughout the Delaware Bay watershed. These conferences serve to keep legislators at all levels of government informed of progress within the estuary program in order to elicit support for the efforts of the DELEP. The Legislative Liaison Program also organizes briefings, special events, and estuary tours.

The most recent Legislative Conference was held in October 1990. This conference provided an overview of the National Estuary Program and how DELEP fits into the entire program and how the state legislatures can assist in protecting Delaware Bay. The next conference, scheduled for August 1991, will focus on land use options for protecting the estuary.

Project Funding

The Legislative Liaison Program receives funding from the overall DELEP PPTF budget. This money is set aside for programs dealing with public education and outreach. The major expense for the Legislative Liaison Project is the annual Legislative Conference.

Project Status

The Legislative Liaison Project conducts annual Legislative Conferences, with the most recent being held in October 1990 and the next scheduled for August 1991.

Project Management

The Legislative Liaison Project is overseen by the PPTF and the LGC. Members of these DELEP committees organize and conduct the annual Legislative Conferences. They also produce periodic educational material for distribution to Legislators in the Delaware Estuary.

Project Highlights

The Legislative Liaison Project has been in existence since 1989 and has conducted several Legislative Conferences. These conferences have been well attended, especially by state officials from Delaware, Pennsylvania, and New Jersey. There is not as much interest in these conferences among national or local officials within the Delaware Bay watershed.

One of the primary purposes of the Legislative Liaison Project is to increase legislative funding for DELEP projects and research. However, there has not been a noticeable increase in funding since the inception of the Legislative Liaison Project. Therefore, the project's primary success has been in increasing awareness of DELEP activities among state legislators.

References/Contacts

For additional information regarding the Legislative Liaison Project, the following can be contacted:

- Steve Feltenberger, DELEP Assistant State Program Coordinator, P.O.Box 8761, Harrisburg, PA 17105-8761. Telephone (717) 541-7808.

Teacher Training Program

Puget Sound

Project Description

The Office of Environmental Education of the Superintendent of Public Instruction has coordinated a successful program to train elementary, middle school, junior high, and high school teachers in environmental education.

School Districts throughout the Puget Sound Region are provided with funds to pay for teacher release time to attend environmental education workshops coordinated by the Superintendent's office. The workshops are facilitated by non-profit organizations and state environmental agencies who wish to conduct them. Teachers may use the release time for workshop training or to modify their existing curriculum to the local situation in Puget Sound. This includes incorporating information on water quality, habitats, and pollution issues.

The workshops include a wide variety of water quality topics. They typically last for ten hours and teachers can earn one continuing education credit at local universities by attending. Workshops are open to any teacher in grades K through 12 in both public and private schools. The number of participating teachers varies, however workshops are usually limited to thirty teachers.

Project Funding

The Puget Sound Water Quality Authority (PSWQA) provides funds to the Superintendent of Public Instruction to carry out this program. The program was partially funded through the PSWQA Public Education and Involvement (PIE) Fund. The money is used to hire substitute teachers to fill in while regular teachers are attending the workshops. Facilitators are provided with support and they are reimbursed for workshop materials.

This project has received two funding grants. The first grant was for \$50,000 for the 1987-89 biennium, and the second was for \$40,000 for the 1989-91 biennium.

Project Management

This program is coordinated and supervised by a staff at the Office of Environmental Education who coordinate the workshops and facilitate the teacher release time by reimbursing schools who send teachers to participate in the program.

Project Status

This project has been ongoing for four years. To date fifty five workshops have been sponsored and over twelve hundred teachers have been trained. An even greater demand for this funding program is anticipated in the future due to tighter budgets, familiarity of teachers with the substitute reimbursements, and the continuing need for water quality workshops.

Project Highlights

Program administrators and teachers both agree that this project has been very successful because it has been able to reach teachers who otherwise would not be able to attend these workshops. Teacher evaluations of the workshops have been very positive. Teachers who knew nothing about environmental education are learning a great deal, and even those who had some prior knowledge are learning new things and are benefiting from the program.

In addition to educating teachers, the program has brought about a greater collaborative effort and willingness to cooperate between the state agencies and non-profit organizations who facilitate the workshops.

References/Contacts

For further information on the Teacher Training Program, please contact:

- Ms. Rika Cecil, Project Coordinator - Office of Environmental Education. Telephone (206) 542-7671
- Mr. Tony Angell, Office of Environmental Education. Telephone (206) 542-7671
- Mr. Bob Steelquist, Puget Sound Water Quality Authority. Telephone (206) 493-9300

Merchants Millpond Stormwater Demonstration Project

Albemarle/Pamlico Estuarine Study

Project Description

Merchants Millpond is a state-owned park in Gates County, North Carolina, with a drainage basin covering 60 square miles of mostly forested land. However, in the unforested area, there are over 300 farming operations, and 30 percent of these farms support confined animal populations. In addition, ranged hogs are common in the wetland areas of three swamps within the watershed. Millpond has an average depth of less than two meters and is covered by a variety of aquatic plants. For many decades the pond has served as a catch basin for sediments, fertilizer, and animal wastes washed from the farms upstream. This nutrient load has caused the aquatic plants to grow so dense, that recreational uses of the pond are now impaired in the summer season. To address this problem, the Albemarle/Pamlico National Estuary Program is funding this project to encourage farmers within the pond watershed to implement conventional and unconventional BMPs to reduce nutrient loads to the pond.

A variety of conventional and new BMPs are being evaluated in this project. They include, animal waste management systems, and sediment and nutrient control practices. New BMPs which are found to be successful, will be incorporated into North Carolina's well established cost share program. Currently, this project provides a 75% cost share incentive to farmers who wish to install and implement BMP programs on their farms. If money allocated to a farmer for a BMP is not used within three years, it is put back into the central fund and made available to other farmers wishing to participate. Participation in the project is voluntary.

In addition to the use of BMPs, technical assistance and monitoring programs have been set up. The North Carolina Department of Environmental Management (DEM) conducted a monitoring report for baseline nutrient levels in Millpond. Subsequent monitoring after implementation of BMPs will be conducted in 1992 to determine the progress which has been made in nutrient reduction as a result of implementing the BMPs. A technician has been hired for a three year period by the Division of Soil and Water Conservation (DSWC) to provide technical assistance to farmers seeking BMP contracts. The technician assists farmers in writing BMP plans and conducts public meetings to educate farmers about the project.

Project Funding

Funding for this project comes to the Division of Soil and Water Conservation from the Albemarle/Pamlico National Estuary Program. The first year allocation for the project was \$175,000. Of this original sum, \$69,423 has been used for BMP implementation, \$20,000 has been used for the premonitoring report, and \$85,577 has been targeted for administrative costs

in Gates county. A second year allocation of \$90,000 has been targeted specifically for the implementation of BMP's. The total project budget, therefore, is \$265,000.

Project Management

This project is managed by the North Carolina DEM, DSWC. Upon approval of a BMP contract with a local farmer, the DSWC contacts the Albemarle/Pamlico study and receives funding from the predetermined \$265,000 budget account. The Gates Soil and Water Conservation District (SWCD) administers the project, develops the individual farm plans, and oversees the BMP installation. The DSWC oversees project coordination and provides administrative assistance.

Project Status

This project is ongoing and will continue until the original budget is expended.

Project Highlights

To date, this project has established approximately 100 contracts with landowners in the Millpond watershed. The BMPs implemented with these contracts include soil testing, reduced fertilization, animal waste reuse, and solid waste management.

Using money from the first year allocation, approximately 19,000 acres of land have had soil testing at a cost of \$1 per acre. This was done to familiarize residents with the project and to educate agricultural landowners about over fertilization with commercial fertilizers. As a result of this nutrient management aspect of the program, there has been a significant reduction in over fertilization by farmers. Much work has also been done in applying both solid and liquid animal waste as a natural fertilizer in place of commercial fertilizers.

A new BMP which has proven very successful is the solid set waste management system. Basically, the system consist of running pipes from a waste runoff lagoon and using the lagoon water to irrigate and fertilize crops and grazing land. Bermuda grass, used for grazing animals, has been found to grow extremely well with this process.

Two media tours of the Millpond project area have been conducted to educate the public about the project and spread awareness of the nutrient overloading problem.

One of the most notable accomplishments of this project is the response that has been received from area farmers. Farmer participation in the project is completely voluntary. However, a large number of BMP plans have been developed and implemented throughout the watershed.

The education portion of the project has been very successful at informing farmers of the potential cost savings from reduced fertilizer use and proper animal waste management.

References/Contacts

Albemarle/Pamlico Study. Project Abstracts, FY 1989-90, Oct. 1990.

- Ms. Sandi Horton, N.C. Department of Environment, Division of Soil and Water Conservation. Telephone (919) 733-2302

Electric Avenue Beach Stormwater Demonstration Project

Buzzards Bay

Project Description

Buttermilk Bay, a Southeastern Massachusetts tidal embayment, is located in the Towns of Bourne and Wareham, Massachusetts, at the north end of Buzzards Bay. In 1984, Buttermilk Bay was closed to shellfishing due to high fecal coliform levels. Water quality monitoring conducted by the Barnstable County Health Department indicated that a major source of fecal coliform bacteria to Buttermilk Bay is wet weather storm drain discharges. In this demonstration project, the Buzzards Bay Program designed and constructed a stormwater infiltration system at Electric Avenue Beach in Bourne, Massachusetts in order to determine the effectiveness of these systems in removing bacterial and nutrient contamination from stormwater runoff.

The stormwater infiltration system was designed to intercept the one year design storm (2.8 inches, maximum intensity 2.13 inches/hour) from the storm drain watershed and direct it away from the original outfall. This flow entered a settling tank for solids and floatable waste removal and then was discharged to infiltration galleys. Subsequent monitoring of this system has shown that very few storms cause flow to be discharged from the original outfall. In addition, groundwater monitoring in the area has indicated that the system is very effective at removing fecal coliform.

Funding Sources

This project was completely funded by the Buzzards Bay Program through EPA Region I. Funding was provided for design, construction, and monitoring of the system and equaled approximately \$90,000.

Project Management

Review and oversight of this project was provided by EPA Region I and Massachusetts Coastal Zone Management.

Project Status

The design and construction phases of this project have been completed and monitoring is currently being conducted.

Project Highlights

This stormwater quality control demonstration project incorporated many unique design and oversight aspects which are outlined below.

- The stormwater infiltration galleys are preceded by separation tanks designed to reduce clogging of the permeable soils by sediment and floatable wastes. The separation tank is similar to a septic tank and seems to be effectively removing pollutants, such as suspended solids and petroleum products, which could clog the pores of the infiltration devices.
- Many infiltration devices like that used at Electric Avenue Beach are surrounded by a filter fabric to prevent surrounding soils from entering the void spaces of the washed stone and reducing storage volume and destabilizing the ground surface. However, practice has shown that these filter fabrics have a tendency to clog quickly from pollutants entering the infiltration device. Therefore, the design in this project did not utilize a filter fabric. In this design, progressively smaller washed stone is used in moving away from the concrete infiltration structures. No structural problems have been encountered and no clogging has been observed.
- Because the location of the stormwater infiltration device is very close to the actual beach area, the groundwater elevation is high. Therefore, the distance from the bottom of the infiltration galleys to the mean high groundwater is only two feet. Most infiltration devices are designed to allow for four feet from the bottom of the structure to the mean high groundwater elevation. Groundwater sampling conducted near the infiltration facility has not shown any contamination of groundwater resulting from this design.
- In order to reduce construction costs for the designed infiltration system, EPA and the Buzzards Bay Project utilized personnel from the Department of Public Works in the Town of Bourne for construction. It was shown that the DPW personnel were fully capable of constructing the infiltration system, and significant cost savings could be realized. The experience gained in this design could now be used by the Town of Bourne in the construction and maintenance of additional stormwater infiltration systems.

References/Contacts

- Mr. Robert Morehouse, U.S. EPA Region I. Telephone (617) 565-3513
- Mr. George Heufelder, Barnstable County Health Department. Telephone (508) 362-2511 EXT 331

Maryland Stormwater Quality Control Cost Share Program

Chesapeake Bay

Project Description

The Maryland Stormwater Control Cost Share Program began in 1984 with the appropriation of funds from the Maryland State Legislature. In this program, the Sediment and Stormwater Administration of the Maryland Department of the Environment dedicates funds for counties and incorporated cities to implement stormwater control best management practices. The program funds 75 percent of the stormwater control project with local funds used for the remaining 25 percent. Projects funded through the Stormwater Quality Control Cost Share Program must be stormwater pollution control demonstration projects generally utilizing common best management practices, such as retention ponds, infiltration structures, and shallow marshes. These projects include retrofits into existing systems as well as new construction projects. In recent years, this program has been working closely with the Small Creek and Estuary Program which focusses on restoring degraded urban streams.

Every year, from March through May, the Sediment and Stormwater Administration sends application forms and information packages to counties and incorporated cities. Local officials can apply for funds from the Cost Share program. Typically, the Sediment and Stormwater Administration receives two to three times as many applications as can be funded with the appropriations available. Therefore, the projects are screened for their applicability to the program and demonstration value. Approximately eight to ten projects are funded each year through this program.

Project Funding

As discussed above, this program is funded through yearly appropriations from the Maryland State Legislature. Total funding for the program since its creation in 1984 is approximately \$7.3 million. Annual funding is usually about \$1 million. With these funds and the local 25 percent match, approximately eight to ten projects are funded each year. These funds are obtained through bond issues.

Project Management

This program is overseen and conducted by the Sediment and Stormwater Administration of the Maryland Department of the Environment. Local entities must apply for funds from this program and provide a 25 percent match. The Sediment and Stormwater Administration also provides technical assistance to the local counties and cities for the implementation of the stormwater demonstration projects.

Project Status

This program has been funding stormwater demonstration projects continuously since 1984. It is continuing, with funding for 1991 at approximately \$1 million.

Project Highlights

This program has been very successful at funding local stormwater pollution control demonstration projects. Sending information packages to the eligible counties and cities on a yearly basis has been an effective way to maintain interest at the local level. In fact, approximately two-thirds of the applications for funding must be denied each year. Many of these projects would be denied even if sufficient funds were available since the work to be performed would not fall under the category of work funded through this program. Many cities try to obtain funding through this program for storm drain capital improvement projects. However, if a proposed project does not address stormwater pollution issues, it is denied funding.

The technical assistance provided to local entities by the Sediment and Stormwater Administration is an important aspect of the Cost Share Program. This technical assistance is provided to ensure successful design and construction of the proposed stormwater pollution control projects. Throughout this Cost Share program, approximately 60 to 65 projects have been funded.

The recent combining of resources between the Stormwater Cost Share Program and the Small Creek and Estuary Program allows for even more assistance to local entities. The engineering expertise of the Cost Share personnel can be combined with the habitat restoration expertise in the Creek and Estuary Program to provide total services for restoring urban streams.

Contacts/References

For further information concerning the Maryland Stormwater Quality Control Cost Share Program please contact the following:

- Mr. Tom Tapley, Maryland Department of the Environment, Sediment and Stormwater Administration, 2500 Broening Highway, Bldg. 30, 1st Floor, Baltimore, MD 21224. Telephone (301) 631-3553.

Mamaroneck Harbor Stormwater Demonstration Project

Long Island Sound

Project Description

Mamaroneck Harbor, on the western end of Long Island Sound, has been experiencing periodic beach closures because of fecal coliform contamination. Investigations in Mamaroneck Harbor have shown this fecal coliform contamination to be caused by deteriorated sanitary sewer systems and stormwater runoff from surrounding urban areas.

In order to address the contamination caused by stormwater runoff, the Long Island Sound Study conducted extensive modeling of the Sound and developed acceptable stormwater discharge rates to prevent beach closures. In addition, the Long Island Sound Study evaluated potential structural and nonstructural best management practices (BMPs) for implementation in the Mamaroneck Harbor watershed. From this evaluation, three nonstructural BMPs, catch basin cleaning, street cleaning, and pet waste control, were selected for implementation.

In this demonstration project, the effectiveness of these three BMPs was assessed. Selected storm drains were chosen for monitoring before, during, and after implementation of BMPs. Catch basin cleaning and street cleaning were performed regularly on selected catch basins and streets. Also, a public information program was conducted to increase public awareness of existing pet waste ordinances and the contamination resulting from pet wastes. No changes in stormwater quality were found after the BMPs were put into practice. These results suggest that incorporation of non-structural BMPs in stormwater permits will not affect the stormwater contamination problem in Mamaroneck Harbor. To achieve the goal of improved water quality, effluent permit limits must be incorporated into stormwater discharge permits.

Funding Sources

This project was funded through the Long Island Sound Study and U.S. EPA Region II. The total cost of the project was approximately \$220,000 over the three years of the project.

Project Management

The Mamaroneck Harbor Stormwater Demonstration Project was managed by the Long Island Sound Study in cooperation with the U.S. EPA Region II office in New York.

Project Status

Initial investigations, BMP evaluation, implementation and monitoring for this project have been completed. The Long Island Sound Study is currently using the stormwater model developed for this project to determine appropriate discharge permit limitations for fecal coliform.

Project Highlights

This project has done pre- and post-implementation monitoring for fecal coliform contamination in stormwater discharges. Many stormwater quality management plans suggest implementing nonstructural controls such as catch basin cleaning, street cleaning, and pet waste control, to reduce fecal coliform contamination of surface waters. However, few studies, other than the original Nationwide Urban Runoff Program studies, have been performed to determine the ultimate effectiveness of these strategies. Therefore, the results of this study are important to the overall development of stormwater control plans throughout Long Island Sound and other National Estuary Program sites.

Unlike other projects which have focused on implementing nonstructural BMPs across entire watersheds, this project focused attention on specific drainage systems within the Long Island Sound Watershed. Specific streets and catch basins were cleaned and sampling within the drainage systems was conducted. Therefore, the results from this study can be used to accurately predict the level of expected improvement in a specific system from implementation of these BMPs.

References/Contacts

For additional information concerning the Mamaroneck Harbor Stormwater Demonstration Project, please contact the following people:

- Mr. Mark Tedesco, U.S. Environmental Protection Agency, Region II, Water Management Division, 26 Federal Plaza, New York, NY 10278. Tel (212) 264-6991.
- Ms. Susan Beede, U.S. Environmental Protection Agency, Region I, Water Management Division, WQE-425, Boston, MA 02203. (617) 565-3550.

Stormwater Control Guidance

Puget Sound

Project Description

The Washington Department of Ecology (DOE) is providing guidance to local officials in support of local operation and maintenance programs and urbanized area stormwater management programs. This guidance is in the form of rules and guidelines which local authorities can utilize for the development of stormwater programs.

Two comprehensive stormwater management rules have been drafted. The first is a procedural rule written by the Puget Sound Water Quality Authority (PSWQA). This rule informs local governments on which stormwater management ordinances should be developed. The second is a companion rule written by the Department of Ecology which details the technical requirements needed to meet state of Washington water quality standards. These rules contain guidelines which include:

- 1) Procedures for developing, reviewing, and approving local stormwater programs.
- 2) Minimum requirements required by local ordinances for runoff control and system maintenance.
- 3) Minimum requirements for control of private drainage systems.
- 4) Minimum requirements for operation and maintenance programs.
- 5) Methods for disposal of decant water, solids, and other substances from drainage system cleanouts.

Additionally, the rules include procedures for identifying pollutant sources, sampling, spill control measures, enforcement, treatment, and education

These rules are being reviewed by an Advisory Committee in August of 1991. Both rules are expected to be adopted and implemented in early 1992.

Project Funding

The proposed budget for this project is \$26,119 for the 1991-93 biennium. This is a significant drop from \$217,556 which was the proposed budget for the 1989-91 biennium. This drop in funding is due to the fact that the work is nearing completion and the project is in its final phases. According to the Puget Sound Water Quality Management Plan, no money is budgeted for this project beyond 1993.

Project Management

The development of these rules and guidelines is being jointly handled by the PSWQA and the Department of Ecology. Once the rules become effective in early 1992, the DOE will have primary regulatory authority over them. Currently, the DOE has a staff of six people working on the project, and the PSWQA has one staff member. In the biennial budget for 1991-93, there is additional funding available for additional staff to provide technical and implementation assistance for the project.

Project Status

Work has been ongoing on this project since 1987. The project is now nearing completion with approval and implementation of the new rules expected in early 1992.

Project Highlights

The work done on this project to date has brought about several results. A BMP manual has been drafted which provides guidance on erosion and sediment control, land uses, hydraulic modelling, and the design of stormwater retention facilities. The manual is currently under public review and should be finalized in September of 1991. In addition, draft regulations have been developed which require local governments to adopt ordinances to address stormwater and erosion issues which come about as a result of new construction and development. The regulations require records to be kept of all new stormwater control systems. Finally, the DOE has written a rule requiring the Department of Transportation to control runoff from state highways.

References/Contacts

Puget Sound Water Quality Authority. 1991 Puget Sound Water Quality Management Plan.

- Mr. Kevin Anderson, Puget Sound Water Quality Authority Telephone (206) 493-9174
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Artificial Wetland Stormwater Control Project

San Francisco Bay

Project Description

San Francisco Bay, like many other estuaries, is adversely impacted by stormwater runoff pollution. Stormwater runoff transports floatable contaminants, hydrocarbons, toxic contaminants, settleable solids, and nutrients into the estuary during rainfall. This accounts for much of the nonpoint source pollution entering the Bay. In this project, the feasibility of using artificial wetlands to treat stormwater runoff was investigated.

In 1986, Dust Marsh was created by the Association of Bay Area Governments (ABAG) in order to test its stormwater pollutant removal capabilities. This 55-acre marsh, which consists of four different ponding areas, was constructed over a two year period. After construction, the ABAG conducted monitoring of the site to determine the pollutant removal capabilities of the marsh and the effect of stormwater pollutants on the marsh plants. Few results came from this monitoring because the vegetation had not reached equilibrium over the life of the project.

In 1990, the Alameda County Flood Control and Water Conservation District (ACFCD) conducted a field survey of Dust Marsh to determine its current status. It was found that the four ponding areas had completely lost their marsh qualities and had become ponds. However, the inlet to these ponds, Crandell Creek, had become choked with vegetation and its downstream end had become a marsh. Therefore, in this project, this newly created marsh area in Crandell Creek was monitored for its effectiveness in stormwater pollution removal. This marsh receives stormwater flows from a 4.6 square mile urbanized area of Fremont, CA.

In this project the following tasks were conducted:

1. Previous studies conducted at the site were reviewed
2. The marsh's baseline conditions were determined
3. Flow monitoring and sampling equipment was installed
4. A complete full-scale demonstration of the wetland system was conducted during two complete wet-weather seasons
5. The cost of constructing and operating artificial wetland sites at other locations was determined
6. The results of the study will be reported.

The final report, due at the end of August 1991, will discuss the characteristics of the marsh, quantities and qualities of stormwater and dry weather flows passing through it, inlet and outlet concentrations of selected indicator pollutants, and indicators of wetland condition, such as habitat.

Funding Sources

This demonstration project was funded by EPA through the San Francisco Estuary Program and matching funds from the Alameda County Flood Control and Water Conservation District. Total funding for this project is \$121,000, with \$75,000 from EPA and a \$46,000 match.

Project Management

This demonstration project was conducted by the Alameda County Flood Control and Water Conservation District with oversight from U.S. EPA Region 9 and the San Francisco Estuary Program.

Project Status

The project is currently progressing on schedule. Original work began in 1986 by the ABAG and was continued in March 1991 by the ACFCDD. The work is scheduled to be completed in August 1991.

Project Highlights

This project was originally started in 1986 and abandoned because of inconclusive data. However, field surveys in 1990 indicated that areas of Crandell Creek had become marsh-like and the project was restarted. Because of the creation of the four ponding areas in 1986, the results of this study will show the pollutant removal capabilities of both artificial wetlands and wet ponds. Monitoring is primarily being conducted within the naturally occurring marsh area. The results of this monitoring are not currently available. However, by the end of August, the results should be complete and available for use by other areas.

This project began as a determination of the effectiveness of artificial wetlands for stormwater pollutant removal. However, over time, it changed scope and is now focusing on the possibility of using natural wetland areas for pollutant removal.

References/Contacts

- Mr. Tim Vendlinsky, San Francisco Estuary Project, P.O. Box 2050, Oakland, CA 94604-2050. Telephone (415) 464-7996.
- Mr. Scott Wiley, Alameda County Flood Control District. Telephone (415) 670-5576.

Sarasota County Stormwater Utility

Sarasota Bay

Project Description

The Sarasota County Stormwater Utility was created in 1990 to raise funds to perform stormwater related work in the Sarasota County area. This program includes the unincorporated county as well as cities choosing to participate. In this program, residential and non-residential property is assessed a tax based on the number of acres of impervious area on site. Funds raised from this tax are used by the county or participating city for any project dealing with the stormwater drainage system. Funds can be used for capital improvements, system upgrades, or stormwater pollution control projects. There is no requirement that funds raised by the utility be used exclusively for stormwater pollution issues. The program currently includes the unincorporated county of Sarasota, as well as the City of Sarasota. The county stormwater office is actively seeking to include additional area cities in the program.

When a city joins the stormwater utility, the county supplies the city with assessment rates. In addition, the county assumes full responsibility for necessary drainage system maintenance and improvements. In the City of Sarasota, the county conducts operations necessary for the proper operation of the drainage system. All funds raised through the stormwater utility are collected by the county and used to perform work on the city drainage system. Funds expended on drainage system work are equal to funds raised by the utility in that city.

Project Funding

The rate charged to residential dwellings is determined on the basis of a value called the Equivalent Residential Unit (ERU). One ERU is considered to be 2,582 ft² and the fee charged is \$32.50/per year/per ERU. Single family detached units are assessed at one ERU and all other residential dwellings (e.g., mobile homes, condominiums, apartment buildings, etc) are assessed at 0.71 ERU per unit. Non-residential buildings are assessed based on a calculation of the impervious surface on-site. These non-residential buildings are charged at the same rate of \$32.50 per 2,582 ft² of impervious area.

Project Management

The project is completely overseen by the Sarasota County Stormwater Office. All funds raised in the unincorporated county or participating city are handled by the County and used for projects in that area. In addition, cities choosing to participate in the utility relinquish local control of their drainage system maintenance and upkeep. Funds are not channelled back to the local municipality for use at their discretion.

Project Status

Currently, the stormwater utility raises funds only in the unincorporated county and the City of Sarasota. The County is actively seeking to convince other cities in the area to participate in the utility. The utility has only been in existence for nine months. Therefore, the number of projects funded by the utility is not large. The budget for the utility in its first year has been \$5.5 million.

Project Highlights

The number of highlights from this project is limited by the short length of time the utility has been in existence. However, in the nine months of its existence, the stormwater utility has been able to raise \$5.5 million for use in stormwater projects in the county and City of Sarasota. These funds have been used in general capital improvement projects as well as stormwater pollution control projects. One of the projects funded by money from the stormwater utility is the Clower Creek project in the City of Sarasota. In this project, a stormwater management plan is being developed for a highly urbanized area of Sarasota.

The program has been successful at raising and distributing funds for stormwater projects. However, it has been less successful at convincing area municipalities to participate in the program. The utility is still trying to convince other municipalities to participate in the program.

Contacts/References

Sarasota Bay National Estuary Program. Annual Report, Fiscal Year 1990.

- . Mr. J.P. Marchand, Sarasota County Stormwater Manager. Telephone (813) 378-6180.

Rhode Island Hazardous Waste Reduction Project (HWRP)

Narragansett Bay

Project Description

The Rhode Island Hazardous Waste Reduction Project (HWRP) was originally started under the Narragansett Bay National Estuary Program (NEP) and later transferred to the Rhode Island Department of Environmental Management (RIDEM). The HWRP was established to assist Rhode Island companies in reducing their use and disposal of toxic and hazardous materials. The project furthers the Bay Project's objective of drafting a comprehensive water quality management plan for Narragansett Bay by demonstrating the need for and use of land based pollution controls in the bay drainage basin, and by providing direct technical assistance in waste reduction technologies to Rhode Island industries.

The HWRP has assisted the Office of Environmental Coordination (OEC) in the establishment of a technical assistance program that is characterized by cooperation between government, industry and academia. The University of Rhode Island (URI) is an academic and technical participant in the program. Resources such as an information center, training sessions, technology transfer forums, state sponsored consulting, and a statewide waste reduction newsletter are made available to Rhode Island manufacturers. Approximately \$1.5 Million dollars in grant funds are currently available to aid manufacturers in the establishment of waste reduction programs.

Under the HWRP, companies can request a technical assessment of their hazardous waste generation practices. Assessment teams are then sent to inspect the company's industrial processes to identify possible areas to reduce hazardous waste production or discharge. The assessment teams are usually made up of two or three people. They are staffed in part by undergraduate students from the URI Chemical Engineering Department. Staffing is also provided by OEC personnel and a PhD student funded by the Narragansett Bay Program. Prior to an assessment, the team leader meets with the facility manager to outline the assessment procedures and become familiar with the rules and policies of the company. The company is asked to provide data on flow and quantities of hazardous materials in the plant. During the visit, the company supplies a plant guide and a small working area for the assessment team.

Within two weeks of the plant visit, the assessment team supplies a preliminary conclusions report. A formal report is submitted six weeks later. The report identifies ways to reduce hazardous waste generation in the plant and recommends process modifications and waste reduction technologies. In addition, a cost benefit analysis is provided to help evaluate the practicality of incorporating the findings of the report. Once the report has been issued, the company is asked to supply a quarterly report (1 page) on waste reduction progress at their facility.

This service is provided free of charge by the DEM and has been very successful so far. As a result of participation in the program, several companies have established in-house waste reduction teams. In some cases, grants are provided to companies for research and the development of waste reduction demonstration projects.

Project Funding

This project was initiated in 1988 with \$150,000 from the Narragansett Bay Program. This funding was matched by the Rhode Island DEM. In addition, a \$2 million dollar bond issue was given to establish a grant program for industry.

In 1989, the EPA provided a \$300,000 Source Reduction and Recycling Technical Assistance grant. Also in 1989, a Hard to Dispose of Law was passed in Rhode Island which places a front end tax on those items which are difficult to dispose of. The program is slated to receive \$200,000 to \$300,000 from this tax.

Project Management

This program was originally started by the Narragansett Bay NEP, but has since been transferred to RIDEM's Office of Environmental Coordination. The State provides funding for a program manager and a staff of about seven people.

The University of Rhode Island is supplied with funds by the EPA to provide graduate and undergraduate students for the program. So far, the chairman of the Chemical Engineering Department and seven students have participated in the program.

Project Status

This is an ongoing project. To date, sixty five company assessments have been completed. Money from the Hard To Dispose Of tax will be used to continue the program.

Project Highlights

One of the goals of this program is to encourage companies to establish their own in-house hazardous waste reduction teams. Several companies who have participated in the program have established these teams.

A major success story of the program was a \$125,000 grant given to the Narragansett Coated Paper Company to switch their coating process from solvent based to aqueous based. This resulted in a waste reduction from 180 drums per year to 20 drums per year.

As a result of its participation in this program, the URI Chemical Engineering Department has been designated as the Rhode Island Center for Pollution Control. In addition, a graduate level course in pollution prevention is now being offered.

The project has also led to the development of the first statewide Rhode Island Pollution Prevention Council. The council is made up of twenty members representing industry, trade associations, academia, and government.

On June 4, 1991 the Rhode Island DEM received a National Environmental Achievement Award from the National Environmental Awards Council for its implementation of the HWRP.

References/Contacts

- Mr. Richard Enander - Rhode Island DEM (401) 277-3434
- Mr. Victor A. Bell - Rhode Island DEM (401) 277-3434

Urban Bay Action Teams

Puget Sound

Project Description

In 1985, as part of the Puget Sound Water Quality Management Plan, the Washington State Department of Ecology and the U.S. EPA began the development of Urban Bay Action Programs for urban bays within Puget Sound. The goals of these programs are to protect the marine environment from man made inputs of toxic materials, restore areas which are already degraded, and to protect beneficial uses which could be affected by toxic contamination.

There are four basic phases of an Urban Bay Action Program:

- 1) Compile available data on the bay and identify problem areas.
- 2) Describe current agency activities, identify management gaps, and develop source control action plans.
- 3) Implement source controls and remedial actions and evaluate the results.
- 4) Complete any necessary revisions to the action plan.

As part of an Urban Bay Action Program, Urban Bay Action Teams (UBATs) are established to carry out the program. An action team is a field task force composed of technical staff from appropriate regulatory and planning agencies. Each team identifies pollutant sources, performs site inspections, issues and revises discharge permits, encourages BMPs, and initiates regulatory responses to violations. Each action team has responsibility for one specific bay within the sound and is also charged with educating, giving technical assistance, and seeking voluntary cleanup efforts.

The number of individuals on an action team depends on the size and complexity of the bay. Members of an action team should have training and/or experience in regulatory programs, permits, and enforcement actions. In addition, action teams should include members with qualifications in environmental chemistry, site investigation, treatment technologies, BMP implementation, and community relations. The leader of an action team, as well as most of its other members, should represent lead enforcement agencies such as state and federal resource or environmental protection agencies, and municipalities. Action teams are most effective when all or most of the appropriate regulatory agencies are represented on the team.

The regulatory authority which action teams have comes from discharge permit and inspection requirements under the federal Clean Water Act and hazardous substance control regulations under CERCLA and RCRA. Additional regulatory authority is derived in the State of Washington from the state's Model Toxics Control Act, the NPDES program, and the CSO control statute.

Action Teams are already in place in several bays within Puget Sound and they have implemented Urban Bay Action Programs. In other parts of the Sound, teams are being formed and Action Program plans are in various stages of development.

Project Funding

This project is funded by the Puget Sound Water Quality Authority. The proposed budget for Urban Bay Action Teams in the 1991-93 Biennium is \$1,434,721.

Project Management

Urban Bay Action Teams are at the center of the organizational network of the Urban Bay Action Programs. The action teams are directly supported by an Interagency Work Group and a Citizens Advisory Committee. The Interagency Work Group is composed of representatives from the county, city, state, port authorities, and NOAA. This group assists the action team in activities such as securing commitments from resource agencies, coordinating program activities, developing corrective actions, and reviewing progress.

The Citizens Advisory Committee is composed of concerned citizens along with representatives from industry, businesses, and environmental groups. The CAC provides comments to the Interagency Work Group, identifies public concerns on relevant issues, disseminates action plan information, and helps insure the accountability of program participants responsible for performing remedial actions or investigations.

In addition to these two supporting groups, action teams work directly with the state agencies responsible for implementing elements of the overall action plans. Through this interaction with state agencies, action teams also receive input from the EPA Regional Office and the Regional Water Quality Planning Body.

Project Status

The Urban Bay Action Program is an ongoing program and is part of the Puget Sound Water Quality Management Plan. Action Teams have completed program plans for Elliot Bay, Commencement Bay, Sinclair/Dyes Inlet, Lake Union/Ship Canal, and Everett Harbor. Teams are nearing completion of plans in at least two other areas of Puget Sound. The Puget Sound Water Quality Management Plan has proposed budgeted funds for Urban Bay Action Teams up through 1997.

Project Highlights

Urban Bay Action Teams are key elements of the Puget Sound Urban Bay Action Program. Teams have been established and have completed action plans in five areas within Puget Sound. Development of plans is in the final phases in two other parts of the Sound.

To date, over 600 inspections of nearly 300 sites and facilities has been completed. Approximately 100 warning letters and Notices of Violation have been issued and penalties amounting to over \$200,000 have been assessed. Cleanups have been completed at 14 sites and the Action Program has worked with responsible industries to clean up 56 leaking underground storage tanks.

In addition to cleanup and NPDES permitting efforts, educational and technical assistance has been provided to the public, media, and public and private dischargers.

References/Contacts

Puget Sound Water Quality Authority. 1991 Puget Sound Water Quality Management Plan.

Puget Sound Water Quality Authority. Urban Bay Action Teams Progress Report, Executive Summary.

U.S. Environmental Protection Agency, Region 10, Office of Puget Sound. The Urban Bay Action Program: A Focused Toxics Control Strategy.

- Mr. Michael Wheeler, Puget Sound Water Quality Authority Telephone (206) 493-9176

Household Hazardous Waste Program

Puget Sound

Project Description

In 1985, Household Hazardous Wastes (HHW) were included in the Washington State Hazardous Waste Management Act under the category of moderate risk waste. Local governments were mandated to undertake a planning process to identify local risk management options and to implement a management program for these wastes by December 1991.

This project is a two part program aimed at reducing and managing household hazardous waste through the implementation of local hazardous waste plans and by providing information and education on less toxic alternatives for household products.

Under this program, four counties in the Puget Sound Region received grants to act as pilot programs for completing their local hazardous waste management plans. These pilot programs were all completed by February 1990. The remaining Puget Sound counties submitted final drafts of their local plans for approval by the Department of Ecology and adoption by local authorities. To date, five more county plans have been approved and three more will be approved within a few months.

State Guidelines call for the local management plans to focus on an initial five year period, second generation plans due in 1995 will be prepared for a twenty year time frame. The Department of Ecology has provided the local governments with a set of guidelines which outline the key elements each plan should have. These elements include:

- 1) Household Hazardous Waste Education.
- 2) HHW Collection and Waste Handling. Collection programs target potentially recyclable wastes such as oil and paints.
- 3) Small Quantity Generator (SQG) Education and technical assistance. Assistance is provided in the form of printed materials, seminars, workshops, and a telephone info line.
- 4) SQG Collection and Waste Handling.
- 5) Compliance with the plan is enforced by enhancing local ordinances, SQG surveys and audits, and the establishment of a response network.

These plans, once enacted, will ensure full implementation of recent amendments to the Hazardous Waste Management Act and will improve management of household waste by providing for appropriate disposal options within each community. Cost estimates for implementation of plans throughout the Puget Sound region are \$10 to \$16 Million per year.

A major component of this program is public information and education. The Department of Ecology (DOE) and the Puget Sound Water Quality Authority are working with local governments, retailers, and the Washington Toxics Coalition to collect information on less toxic alternatives to household toxicants. Information is disseminated through newsletters, pamphlets, fact sheets, education programs, PIE fund projects, and Ecology's 1-800-RECYCLE hotline.

The DOE's Solid and Hazardous waste program is carrying out a program to educate homeowners on safe use, storage, and disposal of home and garden chemicals. In addition, the Cooperative Extension will be working with state agencies and local organizations to develop a regional pesticide education program. The program will provide training on proper use and disposal of pesticides and will act as a support for the local household hazardous waste plans.

Project Funding

The four original pilot projects were funded with monies from the Washington Centennial Clean Water Fund which is supported by the Washington Cigarette Tax.

Planning and implementation activities in the other counties are funded by the Local Toxics Control Account and by local utilities which in turn receive funding through Board of Health and Solid Waste tipping fees. The Local Toxics Control Account was established in 1988. Money is put into this account by the state and from the Hazardous Substance Tax which places a .07% tax on the first in-state possessors or manufactures of substances classified as hazardous.

The cost for implementing the local management plans, especially waste collection activities, is expected to gradually increase over time, reflecting the increase in service and the amount of waste collected.

Project Management

The Washington DOE has oversight responsibility for this program. At the local level, planning and implementation activities are typically undertaken by local health or public works departments. These departments work in conjunction with a Hazardous Waste Public Advisory Committee or Technical Planning Committee.

Project Status

This program has been ongoing for two years and only three remaining Puget Sound counties are awaiting approval of their local management plans. This approval is expected before December 1991.

Implementation of waste management plans has already begun in the four pilot counties including King County, which includes the city of Seattle, the largest city in the state of Washington.

Project Highlights

A strongpoint of this program has been the establishment of a successful collection system for Household Hazardous Waste in the Puget Sound region. Presently, there are five functioning permanent collection facilities and two mobile collection systems. The King County mobile collection unit has already served over 17,000 households. Two additional permanent facilities are in the planning stages. In addition, there have been numerous Household Hazardous Waste collection events in the region. The Department of Ecology has a manual "Guidelines for Collection Events" on how to plan and implement Household Hazardous Waste collection days in communities.

References/Contacts

Local Hazardous Waste Management Plan for Seattle-King County. Final Plan and Environmental Impact Statement for the Management of Small Quantities of Hazardous Waste in the Seattle-King County Region, August 1989.

Puget Sound Water Quality Authority. 1991 Puget Sound Water Quality Management Plan.

Washington State Department of Ecology. Planning Guidelines for Local Hazardous Waste Plans, 1987.

- Mr. William Green, Washington Department of Ecology. Telephone (206) 438-7233
- Ms. Kathy Minsch, Puget Sound Water Quality Authority. Telephone (206) 493-9408
- Mr. Dave Peeler, Washington Department of Ecology. Telephone (206) 438-7060

Shoreline Erosion Control Demonstration Project

Albemarle/Pamlico

Project Description

Most of the shoreline of the lower Albemarle/Pamlico Estuary is eroding due to natural geologic processes. This erosion is expected to continue and possibly accelerate in the future. As development continues to increase around the estuaries, landowners will eventually feel threatened by erosion, and will look for a low cost alternative to halt the process. The goal of this project is to demonstrate an effective, low cost erosion control device which will decrease the erosion rates along the estuarine shorelines by increasing the acreage of marsh habitat in the Albemarle/Pamlico Sounds.

Marsh grasses have been used for shoreline erosion control for over two decades. They act as biological filters of upland surface runoff and improve water quality by removing sediments and nutrients. Establishing a fringing marsh will stabilize upland areas by dissipating wave action and decrease erosion due to the erosion resistant peat layer which forms around the roots of marshland plants. Studies have indicated that marshes in low lying areas continue to exist by migrating along their inland fringe. However, marshes along higher elevation shorelines have some of the highest erosion rates in the sounds. This is due primarily to the constant wave action found in tidal areas.

In this project, low elevation breakwaters are being constructed that will protect marshes from normal wave action and allow an expansion of marsh grass into areas where they would normally be washed away. Under this project, a site selection committee made up of 5 members representing permit agencies, the soil conservation service, and the principal investigator, has selected 10 to 15 favored project sites based on a set of selection criteria. Acceptable sites must have at least one mile of open water offshore for proper wave generation. The slope of the beach must be flat and capable of growing marshes at least 20 feet wide. Also, there must be easy public access and the water depth at normal high tide must be no greater than 2.5 feet at a distance of 50 feet offshore. Sites that are selected will be spread geographically over the APES study area.

Once a site is selected, the breakwater is constructed between 30 and 50 feet offshore. The breakwater is made of wood and is similar to a bulkhead in appearance but no backfill material is used. Once the breakwater is in place, marsh grass is planted along the shoreline behind the protective structure. Costs for constructing the breakwater and planting the marsh grass are expected to be between \$25 and \$35 per foot of shoreline protected.

Funding is available to assist property owners in constructing the breakwater, obtaining permits, and planting the marsh grass. A 50% cost share is available to owners through the program if they agree to allow shoreline access to show others of the effectiveness of this method. The

property owner assumes ownership of the structure and is expected to perform reasonable maintenance for at least 5 years. Periodic public and private inspections and monitoring will take place by those interested in the project.

Once a dense growth of marsh grass has been established along a stretch of shoreline, usually between one or two growing seasons, a significant reduction in shoreline erosion can be expected.

Project Funding

This project is funded by grants from the Albemarle/Pamlico Study to the University of North Carolina Sea Grant Program. The first year project grant is for \$69,300, and the second year grant is for \$15,700.

Project Management

This project is managed by the principal investigator at the University of North Carolina. The principal investigator handles all breakwater designs and permit applications.

The site selection committee is responsible for selecting appropriate sites which are spread geographically throughout the Albemarle/Pamlico Study area.

The property owners are responsible for obtaining bids from contractors for performing the breakwater construction work.

Project Status

This project is ongoing. Funds are available for the construction of breakwaters at up to 15 different sites. One project site has already been permitted and three other sites have been selected and are in the process of being permitted. Pending approval, construction will begin at these sites.

Project Highlights

Existing erosion control methods such as bulkheads, revetments, and groins may minimize adverse environmental effects on shorelines. However, they also offer little or no environmental benefits to the estuary. This project is unique in that it provides erosion control with a low cost breakwater, while at the same time being clearly beneficial to the estuary by establishing salt marshes in areas where they would otherwise not grow. The use of these wooden breakwaters is expected to provide a five or ten fold increase in the shoreline length where successful

plantings of marsh grass for erosion control are possible. The breakwaters are designed for increased longevity and can be installed at a low cost. This makes the project more attractive to property owners and increases the chance for widespread participation .

References/Contacts

Marsh Grass Protection with Low-Cost Breakwaters Shoreline Erosion Control Demonstration, Proposal to APES, January 1990.

Erosion Control: MARSH and Low-Cost Breakwater. Coastal Zone '89. Spencer M. Rogers Jr.

- . Mr. Spencer M. Rogers Jr., Principal Investigator. Telephone (919) 458-8257

Stream Team Program

Puget Sound

Project Description

This program is sponsored by the City of Bellevue Storm and Surface Water Utility, with assistance from the Puget Sound National Estuary Program (NEP). The original aim of the program was to get people in the Kelsey Creek Watershed involved in monitoring, surveying, and enhancing the stream systems in their community. The program was later expanded to include the Coal Creek Watershed.

The stream team program involves recruiting, training, and supervising volunteers as well as providing appropriate agencies with information gathered by the teams. Six volunteer stream teams were established, five for Kelsey Creek and one for Coal Creek. Each team is responsible for caring for a different area within the watershed. In addition to forming the teams, a Stream Team Guidebook was drafted which outlines the program goals and organization. This guidebook is a high quality illustrated book which provides general information and is used as an easy reference. The Stream Team Program has received much recognition because of the usefulness of its guidebook.

To train the volunteers, a series of six workshops is used, each one covering a different aspect of stream protection. The workshops are titled Stream Bugs and Water Quality, Urban Salmon and You, Streams and Urban Flood Control, Stream Habitat Evaluation, Wetlands, Wildlife and You, and Landscaping for Healthy Streams.

The Stream Bugs and Water Quality Workshop educates volunteers on the importance of water insects and their effect on water quality. Aquatic insect sampling kits are given to the volunteers who take samples and help evaluate the water quality. In addition, appropriate actions which should be taken in the event of pollution spills and fish kills are discussed.

In the Urban Salmon and You Workshop, volunteers are taught how to identify different types of salmon and to record migration and spawning information. In early January, egg tubes are placed in the creeks and volunteers are invited to participate in a salmon rearing project.

During the Streams and Urban Flood Control Workshop, participants are given a tour of the City of Bellevue's stormwater management system. Volunteers are taught how to respond during flood conditions and how to operate level gauges and take stormwater samples.

The Stream Habitat Evaluation Workshop teaches participants how to conduct stream surveys using the EPA's streamwalk method. The survey results help map seasonal changes with particular emphasis on the changes associated with physical improvements i.e. road crossings, revegetation, etc.

The Wetlands, Wildlife and You workshop instructs participants on how to identify wetland plants. A wetland field trip is conducted to view wildlife and collect samples of smaller wetland wildlife. A survey for the noxious weed purple loosestrife is conducted in the summer. The survey results help state and county noxious weed boards map the migration of purple loosestrife in the area.

Homeowners who take part in the Landscaping for Healthy Streams workshop learn how to enhance the stream environment through proper yard maintenance techniques. Appropriate tools, plants and materials are discussed for landscaping around streams.

Another phase of the project is to educate the public on stream protection through mailings and media presentations. As part of this process, local citizen groups were given stencils which read "Dump No Waste. Drains to Stream". The groups were given instructions to spray paint this message on storm drains throughout the region.

Stream Team volunteers have the opportunity to work with various groups such as scouts, schools and other community organizations. A quarterly newsletter relays project progress and training information to citizens and broadens public awareness of stream protection issues and activities.

Project Funding

This project was initially funded through the Puget Sound Public Involvement and Education (PIE) Model Projects Fund. This PIE fund was developed by the Puget Sound NEP to provide funding for public education and involvement efforts in the Puget Sound watershed. The PIE fund grant was for \$30,000. An additional \$32,000 was provided by the Storm and Surface Water Utility. The project was subsequently funded to carry it through 1991 by a \$115,000 Centennial Clean Water Fund grant from the State of Washington Department of Ecology. \$25,000 of this grant was matched by the city of Bellevue.

Project Management

The project is sponsored by the City of Bellevue Storm and Surface Water Utility.

Project Status

This project is ongoing and is still being sponsored by the Utility. The Centennial fund grant runs out in 1991. However, the Utility plans to continue funding the program with its existing city budget.

Project Highlights

The program currently involves 150 active volunteers in stream protection and monitoring activities. The annual workshop series attracts from 50 to 75 residents to each workshop. The people in the Kelsey Creek and Coal watersheds are now actively involved in protecting their stream habitats. One streamside property owner has even allowed his land to be used as a model revegetation site.

More than 1500 storm drains in the area have been painted with the "Dump No Waste. Drains to Stream" message, and volunteers have participated in several major streamside cleanup projects.

The success of the Stream Team Program has sparked interest in other parts of the country. The educational materials and program format developed for the Stream Team Program are available as examples for other agencies interested in initiating similar programs.

References/Contacts

Puget Sound Water Quality Authority. Public Involvement and Education Model Projects Fund 47 Success Stories from Puget Sound.

City of Bellevue Storm and Surface Water Utility. Stream Team Program Summary.

Ms. Nancy Hansen, City of Bellevue Storm and Surface Water Utility. Telephone (206) 451-4476

Local Government Wetland Preservation Program

Puget Sound

Project Description

The Local Government Wetland Preservation Program is overseen by the Washington Department of Ecology, the state organization directly involved with the Puget Sound National Estuary Program (NEP). This program is designed to aid local governments in preparing their own wetlands preservation programs. A preservation program is a non-regulatory acquisition effort directed at protecting wetlands of special interest and/or significance.

The local government in King County was selected to establish and carry out a model wetlands preservation program. The model program consisted of the following main elements:

- 1) Researching and preparing background material on alternatives that can be used to implement a preservation program.
- 2) Establishing a local preservation program as a model for other jurisdictions.
- 3) Testing the local program model with a wetlands site acquisition.

The Department of Ecology retained the task of preparing a "How To" Guidebook for setting up a local preservation program, utilizing the background materials from the model program.

A committee consisting of representatives from counties throughout the state was convened to aid in the development of the background material and to ensure that the alternatives presented would be applicable for other local governments in the State of Washington. The Department of Ecology supported the project by providing technical advice and assistance.

The King County model wetlands preservation program is under completion and the experience and information gained through the project is being used by the Department of Ecology to develop the "How To" guidebook for use by other local governments in the region. The guidebook will provide an overview of the components of a preservation program and discuss alternatives that can be used by different jurisdictions to implement a program tailored to their needs. This will reduce planning time and initial costs.

Project Funding

This two year project was funded by the EPA with a grant of \$142,000 on September 1, 1989. Of this original sum, \$115,000 was subcontracted to King County for design and implementation of the model preservation program. An extension on the two year time table has been requested to complete the test wetland acquisition.

Project Management

This project was managed at both the State and Local levels. Management at the State level was conducted by the Department of Ecology. At the local level, design and implementation of the model wetlands preservation program was handled by the King County Resource Planning Division.

Project Status

This project is ongoing. The King County model program has been developed and the background information is being used by the Department of Ecology to develop the project guidebook which will be ready in the fall of 1991. Currently, King County is in the process of acquiring their first wetland under their new preservation program.

Project Highlights

This project provides an example to other jurisdictions locally and nationwide of the aspects of implementing a non-regulatory wetlands protection effort. Under this program, a successful reference model has been developed which will be valuable for reducing planning time, and start up costs for others. The project guidebook will be useful not only to communities in the Puget Sound region, but it can be used for the establishment of local preservation programs in other parts of the country.

A major accomplishment of this project is that it has increased the level of awareness about wetlands protection within local governments in the state of Washington. As a result of the project, there is now a marked increase in effort and coordination between different departments within the local government system. In addition, the development of the model program has served to increase coordination between Federal and State environmental agencies.

References/Contacts

Washington Department of Ecology. Creating a Local Government Wetlands Preservation Program. (Due in Fall of 1991)

- Ms. Jane Rubey Frost, Project Grant Officer, Department of Ecology. Telephone (206) 438-7429
- Mr. Derek Poon, King County Resource Planning Division. Telephone (206) 296-8633
- Ms. Kate Stenberg, King County Resource Planning Division. Telephone (206) 296-7266

City Island Habitat Module Project

Sarasota Bay

Project Description

In this project, the Sarasota Bay National Estuary Program restored natural, intertidal habitat on city-owned property on City Island in Sarasota, Florida. Similar habitat restorations will be developed throughout the Sarasota Bay watershed to demonstrate an effective way to replace lost habitat. The restored habitats are designed for species diversity and high productivity of plants and animals native to the area.

The City Island habitat was created on 4-1/2 acres of land adjacent to the office of the Sarasota Bay Program. This site had previously been used for deposition of spoils and construction debris. It is owned by the City of Sarasota which agreed to participate in the habitat creation. The design of this habitat included the planting of marsh grasses and creation of six tidal pools which increased the shoreline of the area by approximately one mile. Construction began in November 1990 and lasted approximately three weeks. The work included an extensive beach clean-up and construction of a boardwalk for public access. More than 100 citizen volunteers planted over 20,000 plants on the site.

Because of the location of this site directly outside the offices of the Sarasota Bay Program and adjacent to Mote Marine Laboratory, it is used as a visitor attraction and public education and outreach project. Even though the site has not officially "opened", tours have been conducted with schools, teachers, public organizations, and local officials. The goal of these tours is to teach Sarasota Bay residents and local officials the importance of preserving and restoring habitats essential to protecting the Bay.

The City of Sarasota is responsible for monitoring the success of the new vegetation and assessing habitat utilization and public awareness. Experience gained in restoring this habitat will be used to restore additional habitats throughout the Sarasota Bay watershed and to serve as the first step toward more extensive habitat restoration throughout the Bay.

Project Funding

This Project was funded by a combined effort of the U.S. EPA Region 4 and the Florida Department of Environmental Regulation (FLDER). U.S. EPA funding was \$50,000 with FLDER contributing \$150,000. Funds contributed by the FLDER came from the Pollution Recovery Trust Fund. This fund receives money from fines levied on polluters throughout the State of Florida. Plants used in this project were donated by FLDER.

Project Management

This project was conducted by the Sarasota Bay Program with funding and technical assistance from the Florida Department of Environmental Regulation and U.S. EPA Region 4. In addition, the City of Sarasota is providing follow-up monitoring of newly planted species and habitat utilization.

Project Status

Construction of the City Island Habitat is complete and some tours have been conducted. The City of Sarasota is currently conducting monitoring of the site for vegetation attrition and species usage. The site will be fully open to the public in early fall once educational signage is installed.

Project Highlights

Habitat protection and restoration programs are often complicated by issues revolving around land ownership. Often, privately owned lands are difficult and expensive to purchase for the purposes of habitat restoration and protection. Therefore, this project concentrated on developing a smaller habitat "module" that is diverse enough to support a variety of uses. In this type of project, land requirements can be greatly reduced by utilizing small, publicly owned lands for creating these habitat modules. This can reduce the time, effort, and cost required to construct these habitats.

The City Island Habitat project has successfully completed construction of a diverse habitat on a previously unused publicly owned property. In this project, 85 to 90 percent of the plantings have survived, thereby decreasing the expected replanting requirements. Also, although actual species diversity monitoring has not been conducted to date, observations indicate a high level of species usage. More precise information will be available once the City of Sarasota begins monitoring the site.

The method utilized in this project for creating small, diverse habitats has proven successful and is being implemented in other areas of the Sarasota Bay watershed. A larger site in Manatee County is currently beginning restoration and other sites within the Sarasota Bay watershed are being identified for restoration.

The public education portion of this project is also meeting with early success. Even though the site is not currently fully open, early tours of the area have increased awareness of the importance of these habitats to the health of Sarasota Bay. Once the site opens in early fall, the level of education is expected to increase.

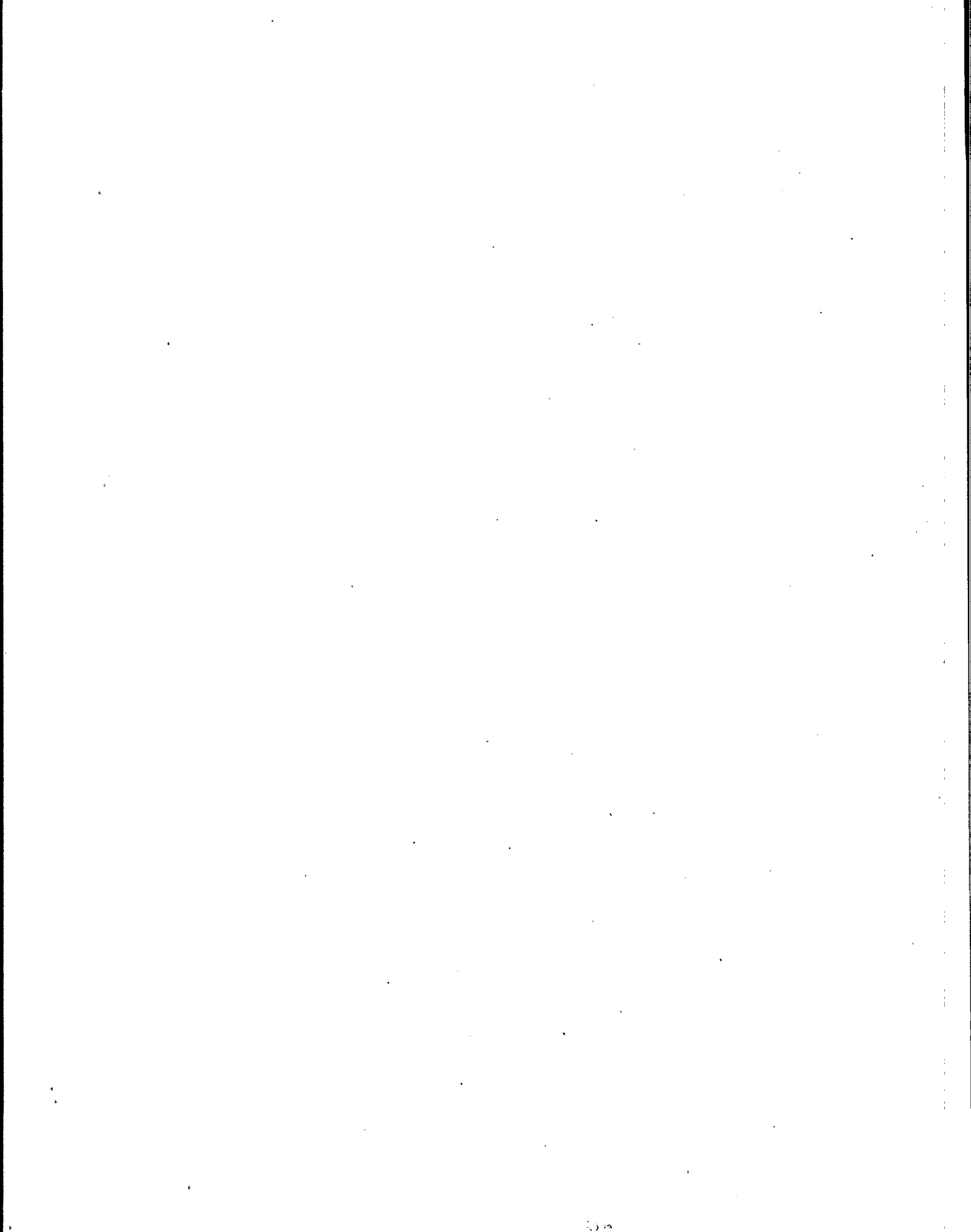
Contacts/References

- Mr. Mark Alderson, Sarasota Bay National Estuary Program, 1550 Ken Thompson Parkway, Sarasota, FL 34236. Telephone (813) 361-6133.
- Ms. Susan Wellington Walker, Sarasota Bay National Estuary Program, 1550 Ken Thompson Parkway, Sarasota, FL 34236. Telephone (813) 361-6133.
- Ms. Heidi Smith, Sarasota Bay National Estuary Program, 1550 Ken Thompson Parkway, Sarasota, FL 34236. Telephone (813) 361-6133.

SECTION III - IDENTIFIED PROJECTS

Section III contains the listing of projects investigated for the preparation of this document. For each project, a brief description is given along with the status of the project, and references for further information. Projects which are shaded and have an asterisk, are the projects of interest described in detail in Section II. The following definitions apply in describing the status of projects in this section:

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| Pending | Pending indicates that the project has not yet been implemented. Reasons for this could include lack of funding, staff, and/or project approval. In some cases, projects may still be in the conceptual or planning stage. |
| Ongoing | Ongoing indicates that implementation of the project has begun. This includes projects in their beginning stages, as well as projects which have been underway for several years. |
| Completed | A completed project is one in which the main task or goal of the project has been achieved. |



LAND USE AND DEVELOPMENT CONTROL PROJECTS

PROJECT TITLE	PROGRAM	PROJECT DESCRIPTION	STATUS	REFERENCE
MD Critical Area Legislation	Chesapeake	Legislation requiring regulation of developments within 1000 feet of the Bay. Most counties have had their protection plans approved.	Ongoing	Second Progress Report Under the 1987 Agreement Dec 1989. Pg. 37
VA Chesapeake Bay Preservation Act	Chesapeake	Tidewater local governments must designate preservation areas and manage land use and development in those areas in a manner that protects water quality.	Ongoing	Second Progress Report Under the 1987 Agreement Dec 1989. Pg. 37
* Dartmouth Water Quality Management Plan	Buzzards Bay	Project funded under the Community Migrants Program for the Town of Dartmouth to delineate the Buttonwood Brook Watershed, document land use patterns and develop a water quality management plan	Completed	Buzzards Bay Draft CCMP May 1990. Pg. 10
* Land Management Project	Narragansett Bay	This is a non-regulatory organization which provides technical, educational, and planning assistance to local and state land management personnel as part of Rhode Island's mandatory comprehensive planning process.	Ongoing	Scope of Work: Land Management Project, Work Element #9. Narragansett Bay Project

BOAT WASTE AND MARINE DEBRIS

PROJECT TITLE	PROGRAM	PROJECT DESCRIPTION	STATUS	REFERENCE
* Marine Debris Demonstration Project	Puget Sound	A recycling program was set up at a marina on Puget Sound. Square wooden receptacles for cardboard, wood, aluminum, and nets were placed at the head of each marina ramp and near the commercial fishing fleet work areas. Educational material about recycling marine debris was distributed. Set up cost and maintenance was low and the project is very successful.	Completed	PIE Model Projects Fund 47 Success stories from Puget Sound
Boater Education Project	Puget Sound	Interpretive signs were installed at 15 marinas and at boat launches. The signs were designed to educate the public about proper disposal of boat waste and environmentally safe boat maintenance.	Completed	PIE Model Projects Fund 47 Success stories from Puget Sound
* New Jersey Marine Debris Recycling Project	NY-NJ Harbor	This was a recycling/education project carried out at three marinas on the harbor. The project explored different recycling methods and multimedia education techniques to determine those which will work best in the future. The final report for this project is very informative and could serve as a model for similar programs.	Completed	Pilot Project to Encourage Proper Handling of Marine Debris at a Series of Small Ports in New Jersey. Final report, Dec 1990
New York Marine Debris Handling and Recycling Project	NY-NJ Harbor	Bulletin boards were installed at five marinas to promote vessel waste exchange and recycling. Educational exhibits were set up. In one bay within the harbor, a trash collection vessel was used to remove trash from other ships.	Completed	NEP Update: NY-NJ Marine Debris Handling and Recycling, June 1990
Marine Craft Discharge Project	Buzzards Bay	This project is a subtask of the Sanitary waste management plan for Buzzards Bay. The project will select a marina and develop a plan to renovate and increase the use of the pump out facility. Public outreach will be used to encourage use of the facility. Water quality will be checked before and after the project to check progress.	Ongoing	Management of Sanitary Waste in Buzzards Bay, FY 1989 Demonstration Project

BOAT WASTE AND MARINE DEBRIS

PROJECT TITLE	PROGRAM	PROJECT DESCRIPTION	STATUS	REFERENCE
Solar Aquatics Treatment	Buzzards Bay	This project is a subtask of the Sanitary waste management plan for Buzzards Bay. A facility was constructed in and adjacent to a greenhouse and used constructed wetlands, plants, animals, and bacteria to cleanse a boat waste and septage stream.	Ongoing	Management of Sanitary Waste in Buzzards Bay, FY 1989 Demonstration Project
Mobile Marine Pumpout Program	Buzzards Bay	This project is funded under the Buzzards Bay Municipal Grant Program. Under this project, the town of Westport will establish a mobile marine pump out program in the Westport River.	Ongoing	Buzzards Bay CCMP Draft, May 1990
New Bedford sanitary waste and used oil pump out facilities	Buzzards Bay	This is a Municipal Grant funded project in which sanitary wastes and used oil from commercial fishing vessels will be handled by newly designed pump out facilities.	Ongoing	Buzzards Bay CCMP Draft, May 1990

CONTAMINATED SEDIMENTS

PROJECT TITLE	PROGRAM	PROJECT DESCRIPTION	STATUS	REFERENCE
Multiluser Confined Disposal Sites Assessment Project	Puget Sound	The Department of Ecology conducted a project to determine the feasibility of designating confined locations as dredged sediment disposal sites. Based on the results, recommendations for the establishment of these multiluser disposal areas will be made.	Completed	1991 Puget Sound Water Quality Management Plan pg. 248
Sediment Cleanup Guidelines	Puget Sound	The Department of Ecology has developed a set of guidelines for deciding whether contaminated sediments should be excavated and treated, or simply left in place and diluted by natural processes. The guidelines are based on many factors including human health risk and cleanup cost.	Completed	1991 Puget Sound Water Quality Management Plan pg. 249
* Sediment Management Standards	Puget Sound	The Department of Ecology has adopted ambient sediment quality standards regulation as part of the State's Water Quality Standards.	Completed	1991 Puget Sound Water Quality Management Plan pg. 213

LOCAL GOVERNMENT/COMMUNITY INVOLVEMENT AND TECHNICAL ASSISTANCE

PROJECT TITLE	PROGRAM	PROJECT DESCRIPTION	STATUS	REFERENCE
* DELEP Local Government Committee	DELEP	Committee designed to oversee DELEP Action Now projects and provide communication with local organizations. The Committee publishes a newsletter.	Ongoing	DELEP Local Government Committee Bylaws
Local Government Water Quality Finance Guidebook	Puget Sound	Manual designed to assist local government officials in locating funds to implement water quality projects. Information on funding sources and support for implementation.	Completed	1991 Puget Sound Water Quality Management Plan Pg. 10
* Nonpoint Source Control: A Guidance Document for Local Officials	Buzzards Bay	Manual designed to provide technical, organizational, and regulatory assistance to local officials in developing local measures to control nonpoint sources of pollution.	Completed	Nonpoint Source Control: A Guidance Document for Local Officials
* Coalition for Buzzards Bay	Buzzards Bay	The Buzzards Bay Project provided funding to develop the Coalition for Buzzards Bay as part of the Citizen's Advisory Committee. The Coalition has since become a self-financing non-profit organization.	Completed	Buzzards Bay Draft CCMP May 1990. Pg. 11
* Buzzards Bay Action Committee	Buzzards Bay	Organization of municipal officials developed from the Citizen's Advisory Committee. The BBAC has received an additional two years of funding by the Buzzards Bay Project to hire an executive director.	Ongoing	Buzzards Bay Draft CCMP May 1990. Pg. 11
Municipal Grant Program	Buzzards Bay	Funding is made available to local communities for implementation of demonstration projects to protect Buzzards Bay. Communities present proposals for projects which are then reviewed by the BBAC.	Ongoing	Buzzards Bay Draft CCMP May 1990. Pg. 9
Marion Citizen Monitoring Program	Buzzards Bay	Project funded through the Municipal Grant program to implement a citizen's monitoring program to collect water quality samples.	Completed	Buzzards Bay Draft CCMP May 1990. Pg. 10

LOCAL GOVERNMENT/COMMUNITY INVOLVEMENT AND TECHNICAL ASSISTANCE

PROJECT TITLE	PROGRAM	PROJECT DESCRIPTION	STATUS	REFERENCE
Falhaven Minigrant Project	Buzzards Bay	Municipal Grant project designed to educate town boards on legal responsibilities and facilitate coordination between boards within and between towns.	Completed	Buzzards Bay Draft CCMP May 1990. Pg. 10
Financial Planning Guidebook	Buzzards Bay	Manual designed to provide guidance to local governments on potential sources of new funding for selected CCMP actions. Guidebook explores six revenue options, as well as four independent financial management mechanisms that are available to local governments in Massachusetts.	Completed	Buzzards Bay Final CCMP May 1991.
* Interagency Technical Assistance Team				
	Puget Sound	Organization with a multi-agency staff to provide technical assistance throughout the planning and implementation phases of local watershed action plan development.	Completed	1991 Puget Sound Water Quality Management Plan Pg. 154
A Citizens Guide to Water Resource Management	Albemarle/Pamlico	This is a short handbook which describes the existing regulatory and non regulatory processes affecting water resources in the study region. The book suggests measures citizens can take to become involved.	Completed	Correspondance with Jennifer Steel Albemarle/Pamlico Study
Citizens Water Quality Monitoring Network	Albemarle/Pamlico	This project has trained roughly 80 citizens of the A/P area to conduct a regular water quality monitoring program. This citizen monitoring program is closely coordinated with the State and USGS monitoring programs.	Ongoing	Correspondance with Jennifer Steel Albemarle/Pamlico Study

NUTRIENT REDUCTION PROGRAMS

PROJECT TITLE	PROGRAM	PROJECT DESCRIPTION	STATUS	REFERENCE
Phosphate Detergent Bans	Chesapeake	Ban on use of phosphate containing detergents. Bans exist in MD, PA, VA, and DC. They are designed to reduce phosphorous loads to Chesapeake Bay.	Completed	Second Progress Report Under the 1987 Agreement Dec. 1989. Pg. 13
Sewage Plant Upgrades	Chesapeake	Implementation of biological nitrogen and phosphorus removal at treatment facilities in MD, PA, DC, and VA.	Ongoing	Second Progress Report Under the 1987 Agreement Dec. 1989. Pg. 14-15
Expansion of Sewer Districts	Chesapeake	Program in PA to set aside funds for communities to connect to sewers and reduce septic system use.	Ongoing	Second Progress Report Under the 1987 Agreement Dec. 1989. Pg. 16
CSO Swirl Concentrator - Anacostia River	Chesapeake	Construction of a swirl concentrator in a CSO in the Anacostia River in DC.	Ongoing	Second Progress Report Under the 1987 Agreement Dec. 1989. Pg. 17
Maryland Agricultural Water Quality Cost-Share	Chesapeake	Financial assistance program for BMP installation. 726 BMP projects were completed in 1989.	Ongoing	Second Progress Report Under the 1987 Agreement Dec. 1989. Pg. 21
PA Planning Assistance Funding Program	Chesapeake	Program developed by PA to provide funds to identify agricultural NPS pollution sources and prioritize watersheds for BMP implementation.	Ongoing	Baywide Nutrient Reduction Strategy - July 1988 Appendix A - Pg. 11
PA Financial Assistance Funding Program	Chesapeake	Program to provide funds for implementation of agricultural BMPs.	Ongoing	Baywide Nutrient Reduction Strategy - July 1988 Appendix A - Pg. 11
PA State Conservation Commission BMP Development	Chesapeake	Development of 15 "standard" BMPs for use in various combinations. Use of these BMPs is automatically approved.	Completed	Baywide Nutrient Reduction Strategy - July 1988 Appendix A - Pg. 11

NUTRIENT REDUCTION PROGRAMS

PROJECT TITLE	PROGRAM	PROJECT DESCRIPTION	STATUS	REFERENCE
PA Technical Assistance Funding Program	Chesapeake	Program to provide funds for implementation of agricultural BMPs.	Ongoing	Baywide Nutrient Reduction Strategy - July 1988 Appendix A - Pg. 12
CRP Incentive Program	Chesapeake	Program to encourage farmers to participate in the Conservation Reserve Program through reduced permit requirements.	Ongoing	Baywide Nutrient Reduction Strategy - July 1988 Appendix A - Pg. 12
PA Manure Management Manual	Chesapeake	Production of a manual of standard manure handling practices. These practices are mandated for use at farms in PA.	Ongoing	Baywide Nutrient Reduction Strategy - July 1988 Appendix A - Pg. 13
PA Agricultural Nutrient Management Program	Chesapeake	Program set up to oversee agricultural BMP development and implementation.	Ongoing	Baywide Nutrient Reduction Strategy - July 1988 Appendix A - Pg. 17
HRSD-New York River WWTF BNR demonstration project	Chesapeake	Implementation of biological nitrogen removal at the HRSD-New York River treatment plant to determine effectiveness of the removal process.	Completed	Baywide Nutrient Reduction Strategy - July 1988 Appendix B - Pg. 5
Kilmarnock WWTF BPR demonstration project	Chesapeake	Implementation of biological phosphorus removal at the Kilmarnock treatment plant to determine effectiveness of the removal process.	Completed	Baywide Nutrient Reduction Strategy - July 1988 Appendix B - Pg. 5
Fredericksburg WWTF simultaneous chemical precipitation	Chesapeake	Implementation of simultaneous chemical precipitation at the Fredericksburg WWTF to determine phosphorus removal effectiveness.	Completed	Baywide Nutrient Reduction Strategy - July 1988 Appendix B - Pg. 5
VA water quality standards	Chesapeake	Development of new water quality standards which designated certain waters as "nutrient enriched".	Completed	Baywide Nutrient Reduction Strategy - July 1988 Appendix B - Pg. 6

NUTRIENT REDUCTION PROGRAMS

PROJECT TITLE	PROGRAM	PROJECT DESCRIPTION	STATUS	REFERENCE
Point Source Policy for Nutrient Enriched Waters	Chesapeake	Policy specifying the nutrient discharge limits for new and existing point sources in nutrient enriched designated waters.	Completed	Baywide Nutrient Reduction Strategy - July 1988 Appendix B - Pg. 6
Biological Nutrient Removal Project	Long Island	Implementation of BNR at two waste treatment plants. Inexpensive retrofit designs are used in converting the existing treatment facilities for BNR.	Ongoing	Long Island Sound Annual Report 1989/1990 Pg. 30
* Nitrogen Overlay District	Buzzards Bay	Development of a watershed nitrogen loading overlay district for land use decisions.	Ongoing	Personal conversation with Carol Kilbride
NPS Nitrogen Project	Long Island	Program to reduce nitrogen discharges from agricultural lands in the Housatonic watershed. Project focuses on soil testing and reduced fertilizer application.	Ongoing	Long Island Sound Annual Report 1989/1990 Pg. 29
Nitrogen and Phosphorus Removal in Coastal Swamps	Albemarle/Pamlico	Program to test the effectiveness of existing coastal swamps for removal of nitrogen and phosphorus from wastewater discharges.	Ongoing	Project Abstracts for the Period 1987-1989. Albemarle-Pamlico Estuarine Study Oct. 1988. Pg. 25
* Sarasota Wastewater Discharge Reclamation	Sarasota Bay	In March 1990, the City of Sarasota ceased discharging treated wastewater to Sarasota Bay via Whitaker Bayou. The treated wastewater is now reclaimed for irrigation at a nearby ranch and golf course.	Completed	Sarasota Bay NEP Annual Report FY 1990. Pg. 11
Virginia Animal Waste Management	Albemarle/Pamlico	Five new waste storage facilities were built under a 75% cost share program and nutrient budgets were developed for all program participants. Thirteen test plots were established to demonstrate the benefits of land waste application techniques.	Completed	Correspondance with Jennifer Steel Albemarle/Pamlico Study

NUTRIENT REDUCTION PROGRAMS

PROJECT TITLE	PROGRAM	PROJECT DESCRIPTION	STATUS	REFERENCE
North Carolina Animal Waste Management	Albemarle/Pamlico	Solid set waste management systems are being installed in three counties in northeastern NC and a program for land application of the waste is being developed. Water quality and receiving system responses will be gauged.	Ongoing	Correspondance with Jennifer Steel Albemarle/Pamlico Study

ON SITE DISPOSAL OF SANITARY WASTES

PROJECT TITLE	PROGRAM	PROJECT DESCRIPTION	STATUS	REFERENCE
* Management of Sanitary Wastes	Buzzards Bay	A manual was developed to help local communities establish septic system requirements such as siting, variances, design flows, and vertical distances to groundwater. Public outreach activities concerning proper septic system maintenance were conducted.	Completed	NEP Updates: Management of Sanitary Wastes In Buzzards Bay, June 1990
On-Site Septic Tank Mapping	Sarasota Bay	As a first step toward developing an education program on tank maintenance for septic tank owners, a project for mapping the location of septic systems is being carried out.	Pending	1991 Action Plan for Sarasota Bay

PUBLIC OUTREACH AND EDUCATIONAL PROGRAMS

PROJECT TITLE	PROJECT TYPE	PROGRAM	PROJECT DESCRIPTION	STATUS	REFERENCE
Public Education	School Related	Puget Sound	The PSWA will distribute information to Public Libraries, conduct field trips, and hold conferences and public meetings to educate the public.	Ongoing	Puget Sound Water Quality Management Plan, Nov.'90 pg. 124
Ferries Presentations	General Info	Puget Sound	The Washington DOT shall begin a program on the State Ferry System to train volunteers to make presentations to passengers. Topics such as history, resources, and environmental protection will be directly related to the Sound.	Ongoing	Puget Sound Water Quality Management Plan, Nov.'90 pg. 118
Wildlife Habitat Education	General Info	Puget Sound	The Washington Department of Wildlife shall implement a program to introduce wildlife education at State Parks and other recreation areas. Training shall be provided to Park Rangers and School Teachers.	Pending	Puget Sound Water Quality Management Plan, Nov.'90 pg. 118
Newsletter	Publication	Puget Sound	The PSWA uses its newsletter, Soundwaves, along with slide shows, and media contacts to publicize opportunities for the public to become involved in Puget Sound policymaking, cleanup, monitoring, and educational activities. The newsletter also gives recognition to programs which work to support the goals of the Puget Sound management plan.	Ongoing	Puget Sound Water Quality Management Plan, Nov.'90 pg. 124
* Teacher Training Program	School Related	Puget Sound	The Office of Environmental Education (OEE) and Superintendent of Public Instruction has coordinated a program to train teachers at levels K - 12 in environmental education. These workshops show teachers how to relate existing curricula to Puget Sound and Water Quality. As of Dec. 1990, 52 workshops had been offered and about 1209 teachers attended.	Ongoing	Puget Sound Water Quality Management Plan, Nov.'90 pg. 121

PUBLIC OUTREACH AND EDUCATIONAL PROGRAMS

PROJECT TITLE	PROJECT TYPE	PROGRAM	PROJECT DESCRIPTION	STATUS	REFERENCE
Habitat Protection	General Info	Puget Sound	The Washington State Department of Wildlife is coordinating with the Departments of Fisheries, Ecology, and Natural Resources to provide educational programs on Habitat Protection to developers, realtors, contractors, businesses, and industry in the region.	Pending	Puget Sound Water Quality Management Plan, Nov.'90 pg. 121
School and Citizens Monitoring Program	School Related	Puget Sound	Under this program, the Washington OEE will provide water quality kits to schools for use in freshwater monitoring projects. In addition, citizen monitors will carry out projects for the Puget Sound Ambient Monitoring Program under volunteer management from the PSWA. This project is not currently funded, but during 1988-1990, citizen monitors helped investigators with three monitoring projects.	Ongoing	Puget Sound Water Quality Management Plan, Nov.'90 pg. 122
Post Secondary Monitoring	School Related	Puget Sound	Agencies and local governments involved in water quality monitoring shall involve universities and colleges in monitoring projects. This will be done through classes, internships, and laboratory use.	Pending	Puget Sound Water Quality Management Plan, Nov.'90 pg. 122
Campaigns for Puget Sound	General Info	Puget Sound	The PSWQA will initiate public awareness campaigns which can address tangible results such as repairing shellfish beds, reducing plastic debris, oil and septage in the Sound, and the restoration of wetlands.	Pending	Puget Sound Water Quality Management Plan, Nov.'90 pg. 124
Year of the Sound Program	General Info	Puget Sound	This program is intended to have the governor of Washington declare 1993 "The Year of the Sound" and appoint a Year of the Sound committee. The committee would seek funding and support from the public and industry to sponsor events which highlight the Sound and what people are doing to protect it.	Pending	Puget Sound Water Quality Management Plan, Nov.'90 pg. 125
Sound Waters Award Program	Awards	Puget Sound	The PSWQA will develop an awards program which recognizes businesses, government, youth groups, or individuals for taking positive action to protect the water quality of Puget Sound.	Pending	Puget Sound Water Quality Management Plan, Nov.'90 pg. 125

PUBLIC OUTREACH AND EDUCATIONAL PROGRAMS

PROJECT TITLE	PROJECT TYPE	PROGRAM	PROJECT DESCRIPTION	STATUS	REFERENCE
Internships and Credit Program	School Related	Puget Sound	Under this program, the PSWA would establish internships and opportunities for students to prepare case studies on issues related to Puget Sound. Credit could possibly be provided for college students and school teachers who participate.	Pending	Puget Sound Water Quality Management Plan, Nov. '90 pg. 122
Water Quality Directory and Information Hotlines	General Info	Puget Sound	The PSWQA updates and periodically distributes a water quality directory for public use. The directory describes appropriate contacts for obtaining information on specific issues related to the Puget Sound Plan. The PSWA also makes use of hotlines to handle inquiries related to the protection of the Sound.	Ongoing	Puget Sound Water Quality Management Plan, Nov. '90 pg. 109
Short Course on Local Planning	General Info	Puget Sound	The Washington Department of Community Development will conduct a short course on local planning which will include a section on Puget Sound water quality protection and public involvement.	Pending	Puget Sound Water Quality Management Plan, Nov. '90 pg. 110
Pollution Prevention Program	General Info	Puget Sound	The Washington Department of Ecology has an active education program for agricultural audiences and pesticide users. The program details actions that are necessary to prevent agricultural and pesticide waste from entering the Sound. Similar programs are planned for industry, commercial fishermen, and the marine transport industry.	Ongoing	Puget Sound Water Quality Management Plan, Nov. '90 pg. 121
Fact Sheets	Publication	DELEP	Fact Sheets are published quarterly and are distributed in the DELEP Newsletter, at meetings, and by the media. Each fact sheet gives detailed information on specific issues affecting Delaware Estuary.	Ongoing	Public Participation Plan DELEP, Jan. '91 pg. 17
Map Oriented Brochure	Publication	DELEP	This color brochure is a pictorial guide to the Estuary on one side, and a map on the other. The map indicates natural resources, use conflicts, and impact zones. It is distributed in large quantities.	Completed	Public Participation Plan DELEP, Jan. '91 pg. 18

PUBLIC OUTREACH AND EDUCATIONAL PROGRAMS

PROJECT TITLE	PROJECT TYPE	PROGRAM	PROJECT DESCRIPTION	STATUS	REFERENCE
Annual Awards Banquet	Awards	DELEP	Once a year, program staff, volunteers, and supporters gather and discuss the years successes. Awards are given to show appreciation for participation and achievement.	Pending	Public Participation Plan DELEP, Jan. '91 pg. 24
Estuary Field Trips	Event	DELEP	This is a popular outreach technique already in use. Legislators, business leaders, clubs, and dischargers are provided with the opportunity to get a first hand look at the estuary in order to highlight specific issues under discussion.	Ongoing	Public Participation Plan DELEP, Jan. '91 pg. 25
LINK Data Base	School Related	DELEP	LINK is an educational database and bulletin board used by school teachers. DELEP news and information can be set up in the LINK system and then be accessed by anyone using the system.	Pending	Public Participation Plan DELEP, Jan. '91 pg. 27
* Legislative Liaison Project	General Info	DELEP	A legislative conference for federal, state, and local officials was sponsored to keep government personnel informed of what is going on in the estuary program. Future efforts will include briefings and estuary tours.	Ongoing	Public Participation Plan DELEP, Jan. '91 pg. 26
Hands on Projects	Event	DELEP	Hands on projects such as litter cleanups will provide a concrete way for the public to get involved in the estuary program. Projects will be planned for both adults and school children.	Pending	Public Participation Plan DELEP, Jan. '91 pg. 25
Clean up the Estuary Day	Event	DELEP	A yearly clean up and beautification event in which people will participate in cleaning up the estuary either on land or from their boats.	Pending	Public Participation Plan DELEP, Jan. '91 pg. 25

PUBLIC OUTREACH AND EDUCATIONAL PROGRAMS

PROJECT TITLE	PROJECT TYPE	PROGRAM	PROJECT DESCRIPTION	STATUS	REFERENCE
Storm Drainage Cleanup Day	Event	DELEP	This is a one day activity which focuses primarily on the Estuary's tributaries. Residents will pick up trash in the gullies that collect storm water and they will be provided with literature on how these individual activities affect the health of the estuary as a whole.	Pending	Public Participation Plan DELEP, Jan. '91 pg. 24
Annual Group Conference	Event	DELEP	An annual conference will be convened to bring environmental and conservation groups into contact with one another. Workshops, group discussions, and problem solving sessions will be held to promote cooperation, share information, and debate issues.	Pending	Public Participation Plan DELEP, Jan. '91 pg. 24
1-800-ESTUARY Project	General Info	DELEP	A toll free number has been set up that the public can use to call in questions regarding the estuary. The number is listed in all estuary publications. This is similar to the Hotlines employed by the Puget Sound Program.	Completed	Public Participation Plan DELEP, Jan. '91 pg. 23
Touring Dramatic School Presentations	School Related	DELEP	Actors will perform a humorous and musical production about the estuary for school age children. After the show, information will be made available on club memberships, litter prevention, and finding summer jobs in the estuary resort region.	Pending	Public Participation Plan DELEP, Jan. '91 pg. 23
Oil Recycling at Service Stations	General Info	DELEP	Service Stations which provide recycling of used oil for the public will be listed in the Estuary newsletter. The goal is to increase the number of participating service stations and provide incentives for stations to participate.	Pending	Public Participation Plan DELEP, Jan. '91 pg. 22
Estuary Library	General Info	DELEP	A library will be set up which contains a data base of all publications and literature on estuary topics. A list of contact people from various agencies and a speakers list will also be included. This will create a central information bank for use by the public.	Pending	Public Participation Plan DELEP, Jan. '91 pg. 22

PUBLIC OUTREACH AND EDUCATIONAL PROGRAMS

PROJECT TITLE	PROJECT TYPE	PROGRAM	PROJECT DESCRIPTION	STATUS	REFERENCE
School Outreach	School Related	DELEP	The public participation coordinator will visit schools and make audio-visual presentations to promote the formation of student estuary groups. The goal is to establish a region wide organization of students.	Pending	Public Participation Plan DELEP, Jan. '91 pg. 21
Lecture Series and Workshops	General Info	DELEP	The public participation coordinator will attend meetings of organizations in the region and make presentations followed by a question and answer session. This will get more organizations involved in the estuary program.	Ongoing	Public Participation Plan DELEP, Jan. '91 pg. 21
Corporate Partnerships	General Info	DELEP	CEO's and VP's of regional corporations will be asked to provide financial support to activities such as public service announcements, videos, and documentaries about the estuary.	Pending	Public Participation Plan DELEP, Jan. '91 pg. 21
Beautiful Bays Calendar	Publication	DELEP	A twelve month color calendar with photographs of the estuary will be distributed to organizations and agencies involved in the DELEP. It will contain educational facts about the estuary as well as environmental holidays (Earth day etc) and will be advertised through the newsletter and media.	Pending	Public Participation Plan DELEP, Jan. '91 pg. 20
Estuary Poster/Brochure	General Info	DELEP	A contest has been held among regional artists to design a high profile poster suitable for framing. It will be distributed to businesses and government officials and be displayed in train stations, book stores, banks, etc. These posters will increase public awareness of the estuary.	Completed	Public Participation Plan DELEP, Jan. '91 pg. 19

PUBLIC OUTREACH AND EDUCATIONAL PROGRAMS

PROJECT TITLE	PROJECT TYPE	PROGRAM	PROJECT DESCRIPTION	STATUS	REFERENCE
Travelling Exhibitions	General Info	DELEP	A gallery style exhibition displaying the work of local artists has been developed and will be available in all three states in the estuary region.	Completed	Public Participation Plan DELEP, Jan. '91 pg. 19
Video Grant Program	Media	DELEP	Five video projects would be produced in successive years. The grant will award funds to produce these videos. The finished videos would be distributed to local television stations for airing. Tapes would also be sent to libraries and video rental stores.	Pending	Public Participation Plan DELEP, Jan. '91 pg. 18
Slide Show Video Tape	Media	DELEP	An informative and motivational slide video would be produced to invite participation in the estuary program. The tape would be distributed to Erol's video stores and loaned out free of charge.	Pending	Public Participation Plan DELEP, Jan. '91 pg. 18
Estuary Trivia	Media	DELEP	A Wilmington, Delaware radio station has offered to include estuary related trivia questions in their existing morning trivia game. Prizes will be given to callers. This could be duplicated with any radio station.	Pending	Public Participation Plan DELEP, Jan. '91 pg. 16
The Estuary Radio Program	Media	DELEP	A short 60 second radio program called "In the Estuary" will be produced and distributed monthly to participating stations. The program will highlight estuary history and will close with a note on how to participate in the Estuary program.	Pending	Public Participation Plan DELEP, Jan. '91 pg. 15
Public Service Announcements	Media	DELEP	Announcements to be aired on radio and TV would be aimed at groups that are not yet involved in the estuary program. They would encourage these groups to become involved and take action.	Ongoing	Public Participation Plan DELEP, Jan. '91 pg. 15

PUBLIC OUTREACH AND EDUCATIONAL PROGRAMS

PROJECT TITLE	PROJECT TYPE	PROGRAM	PROJECT DESCRIPTION	STATUS	REFERENCE
Press Cruises	Event	DELEP	Members of the media would be invited to take cruises on various types of vessels which operate in the estuary. Cruises on fishing boats, shipping vessels, coast guard cruisers, etc would encourage greater press coverage on specific issues concerning each of these vessel types.	Pending	Public Participation Plan DELEP, Jan. '91 pg. 16
State of the Estuary T.V. Public Service Campaign	Media	Albemarle- Pamlico	This television campaign consists of 5 thirty second PSA's which run over a period of 1 year. The PSA's focus on education, the A/P study, and citizen involvement. The PSA's are distributed to 18 T.V. stations.	Ongoing	Public Involvement Plan Albemarle/Pamlico study April 1989
Library Reference Collection	General Info	NY-NJ Harbor	A library which contains all reports, documents, and literature produced by the harbor project is set up and maintained in both of the harbor states.	Ongoing	NY-NJ Harbor Project Fiscal Year 1990 Workplan
Video Documentary	Media	NY-NJ Harbor	Video tape presents regional issues using themes designed to make people understand that the estuary is alive and that they as individuals can make a difference.	Ongoing	NY-NJ Harbor Project Fiscal Year 1990 Workplan
Citizens Lifestyle Guide	General Info	NY-NJ Harbor	A Guidebook geared toward the general population which focuses on problems in the harbor directly related to citizen behavior. The book explains what the problems are, and how people can change their behavior to prevent further damage to the harbor.	Ongoing	Personal conversation with Cindy Rovins - Public Education Coord. NY-NJ Harbor Project
Stormwater Runoff Information Program	General Info	Tampa Bay	This program will be designed to educate people specifically about stormwater runoff. Materials including warning signs, posters, and radio and T.V. ads will be used. The public will be instructed to report illegal discharges and dumping to local officials.	Pending	Tampa Bay NEP FY 1991 Workplan

PUBLIC OUTREACH AND EDUCATIONAL PROGRAMS

PROJECT TITLE	PROJECT TYPE	PROGRAM	PROJECT DESCRIPTION	STATUS	REFERENCE
Speakers Bureau	General Info	Galveston Bay A Bureau	will be coordinated with presentation materials, publications, and equipment for volunteer speakers. The Bay program will provide speakers to give talks in the Houston/Galveston area using the Speakers Bureau to fill the requests for presentations.	Ongoing	The Program in a Nutshell: Galveston Bay Projects GBNEP
Galveston Bay Information Center	General Info	Galveston Bay	An information center was established at the library on the Texas A&M campus. Published and Unpublished reports, articles, maps, and photos will be collected and kept in the information center. A project called COMPAS will allow computer access to information at the center.	Ongoing	The Program in a Nutshell: Galveston Bay Projects GBNEP
Where the Rivers Meet the Sea Booklet	Publication	Albemarle-Pamlico	This is a 67 page booklet describing the physical and cultural aspects of the A/P estuarine system, and the steps citizens can take to become involved in its preservation.	Completed	Correspondance with Jennifer Steel Albemarle/Pamlico Study
A Guide to the Estuaries	Publication	Albemarle-Pamlico	A small booklet discussing the Ecology of the A/P estuary with references on measures of public involvement.	Completed	Correspondance with Jennifer Steel Albemarle/Pamlico Study
Boater Education Project	General Info	Tampa Bay	This will be a comprehensive boater education campaign that will address issues such as sea grass protection, marine debris, and the use of pumpout facilities.	Pending	Conversation with Mary Hoppe, Tampa Bay Project
Ninja Turtle Comic Books	Publication	Santa Monica	Creators of the Teenage Mutant Ninja Turtles designed an original, eight page "Storm Drain Savers" comic book for the Santa Monica Bay Project. The Project is pursuing expansion of the format to a coloring book and also to tailoring the message to be applicable to lake and river areas.	Completed	Contact Project Staff Santa Monica Bay Project

PUBLIC OUTREACH AND EDUCATIONAL PROGRAMS

PROJECT TITLE	PROJECT TYPE	PROGRAM	PROJECT DESCRIPTION	STATUS	REFERENCE
Annual Coastal Cleanup Day	Event	Santa Monica	As part of a statewide program, the SMERP helped coordinate and provided media outreach for Coastal Cleanup Day in Los Angeles County. The day is organized for volunteers to pick up debris and learn about marine pollution. Collected debris was documented on data cards, and compiled nationally by the Center for Marine Conservation.	Ongoing	Contact Project Staff Santa Monica Bay Project
Beach Display/Recycling Stations	General Info	Santa Monica	Marine Debris Education Display/Recycling Stations will be installed in heavy beach use areas. Displays will describe the problem and how individual citizens can help solve the problem. Recycling bags will be provided and recyclables collected.	Pending	Contact Project Staff Santa Monica Bay Project

SHELLFISH BED PROTECTION AND RESTORATION PROJECTS

PROJECT TITLE	PROGRAM	PROJECT DESCRIPTION	STATUS	REFERENCE
Increase Oyster Production Program	DELEP	Project to develop a technique for commercially growing significant numbers of MSX-resistant oysters by expanding the planting of oysters on privately leased grounds	Ongoing	DELEP Regional Plan to Increase Oyster Production Proposal - Feb 1991
Shellfish Protection and Restoration Policy	Puget Sound	Requirement that state and local agencies consider shellfish resources when developing programs for Nonpoint source pollution, stormwater, CSOs, and industrial and municipal discharges	Ongoing	1991 Puget Sound Water Quality Management Plan Pg. 173
Commercial Shellfish Bed Restoration and Protection	Puget Sound	Program to monitor shellfish closures, retest closed sites, monitor sites being addressed by local shellfish protection projects, and develop assessments of pollution sources.	Ongoing	1991 Puget Sound Water Quality Management Plan Pg. 174
Public Involvement and Education	Puget Sound	Educational material including shellfish and watershed displays, a shellfish booklet, and booths.	Ongoing	1991 Puget Sound Water Quality Management Plan Pg. 177
Bay Scallop Mitigation Project	Albemarle- Pamlico	Project to test the feasibility of collecting bay scallops in surviving beds and reintroducing them into areas depleted by the 1987-1988 outbreak of red tide.	Ongoing	Project Abstracts for the Period 1987-1989, Albemarle-Pamlico Estuarine Study. Oct. 1988. Pg. 9
Trawl Excluder Device Evaluation	Albemarle- Pamlico	Project to test and evaluate various devices for reducing the amount of unmarketable finfish accidentally caught by shrimp trawls.	Completed	Project Abstracts for the Period 1987-1989, Albemarle-Pamlico Estuarine Study. Oct. 1988. Pg. 16

STORMWATER CONTROL PROGRAMS

PROJECT TITLE	PROGRAM	PROJECT DESCRIPTION	STATUS	REFERENCE
DC Watts Branch bank stabilization demonstration project	Chesapeake	Stormwater demonstration project in DC as part of the DC stormwater regulations.	Ongoing	Baywide Nutrient Reduction Strategy July 1988 Appendix C - Pg. 4
River Terrace stormwater demonstration project	Chesapeake	Stormwater treatment project at a new housing development in DC.	Ongoing	Baywide Nutrient Reduction Strategy July 1988 Appendix C - Pg. 4
MD State Stormwater Regulations	Chesapeake	Regulations requiring BMP implementation at new development sites. Developers must construct BMPs from a standard prioritized list developed by the State.	Ongoing	Baywide Nutrient Reduction Strategy July 1988 Appendix D - Pg. 12
* MD Stormwater Cost Share	Chesapeake	Funding mechanism for retrofitting demonstration BMPs at existing developments.	Ongoing	Baywide Nutrient Reduction Strategy July 1988 Appendix D - Pg. 12
Red Clay Creek demonstration project	DELEP	Installing BMPs on agricultural lands (mushrooms) to reduce transport of organics and conventional pollutants.	Ongoing	DELEP Red Clay Creek Proposal - Feb 1991
Gloucester County Water Conservation and Water Quality Program	DELEP	Developing and implementing stormwater and landscaping ordinances addressing use of pesticides and fertilizers.	Ongoing	DELEP Gloucester County Proposal - Feb 1991
Chemical Mixing Centers	Indian River Lagoon	Design and implementation of three chemical mixing centers for use on agricultural lands. Demonstration of innovative technology to reduce the threat of surface groundwater contamination from mixing operations.	Pending	USDA SCS Proposal to Demonstrate New and Innovative Pollution Prevention Technologies

STORMWATER CONTROL PROGRAMS

PROJECT TITLE	PROGRAM	PROJECT DESCRIPTION	STATUS	REFERENCE
Operation and Maintenance Programs and Runoff Ordinances	Puget Sound	Program under which all counties and cities in Puget Sound watershed must require stormwater controls for new development and maintenance of public and private stormwater systems.	Pending	1991 Puget Sound Water Quality Management Plan Pg. 262
Stormwater Management Programs for Urbanized Areas	Puget Sound	Program requiring all urbanized areas of Puget Sound watershed to develop and implement a stormwater management consistent with developed model ordinances.	Ongoing	1991 Puget Sound Water Quality Management Plan Pg. 264
Stormwater Control Manual	Puget Sound	Production of technical manuals for use by local jurisdictions in stormwater planning.	Ongoing	1991 Puget Sound Water Quality Management Plan Pg. 267
Local Government Stormwater Assistance Program	Puget Sound	Provides technical assistance to local governments with the design and implementation of local stormwater programs and current stormwater BMPs.	Ongoing	1991 Puget Sound Water Quality Management Plan Pg. 267
* Stormwater Control Guidance	Puget Sound	Guidance to local officials in the development of their operation and maintenance programs and urbanized area management programs.	Ongoing	1991 Puget Sound Water Quality Management Plan Pg. 269
Model Ordinances	Puget Sound	Development of model stormwater ordinances and local government structures for the control of stormwater runoff.	Ongoing	1991 Puget Sound Water Quality Management Plan Pg. 270
Puget Sound Highway Runoff	Puget Sound	Requirements for the Washington State Department of Transportation to develop a program to control runoff from freeways and highways in the Puget Sound watershed.	Ongoing	1991 Puget Sound Water Quality Management Plan Pg. 270
Runoff from Federal Facilities	Puget Sound	All NPDES permits for federal facilities must be reviewed for existence of stormwater controls consistent with other Puget Sound programs.	Pending	1991 Puget Sound Water Quality Management Plan Pg. 272

STORMWATER CONTROL PROGRAMS

PROJECT TITLE	PROGRAM	PROJECT DESCRIPTION	STATUS	REFERENCE
CSO Reduction Guidelines	Puget Sound	Development of guidelines for local planning to achieve the greatest reasonable reduction of pollutants from stormwater and sanitary sewage in CSOs.	Completed	1991 Puget Sound Water Quality Management Plan Pg. 273
* Artificial Wetlands Stormwater Control	San Francisco	Field test of an existing wetland to determine its effectiveness in removing urban stormwater pollutants. The wetland area was constructed in 1980 for the study of stormwater flows.	Ongoing	NEP Updates: Action Plan June 1990. Pg. 9
Clower Creek Stormwater Control Project	Sarasota Bay	Implementation of stormwater quantity and quality control BMPs to reduce stormwater impacts on Sarasota Bay.	Ongoing	NEP Updates: Action Plan June 1990. Pg. 13
Agricultural Stormwater Management Project	Delaware Inland	Control of nutrient loads from agricultural runoff by on-farm BMPs and watershed controls. Watershed controls include constructed wetlands along the Bay. On-farm BMPs will include crop rotation, reduced fertilizer use, and manure retention.	Ongoing	NEP Updates: Action Plan June 1990. Pg. 17
Urban Runoff Ozone Treatment	Santa Monica	Implementation of ozone treatment on dry weather urban flows. This project includes investigations of the potential use of treated flows for golf course or freeway landscapes.	Ongoing	NEP Updates: Action Plan June 1990. Pg. 21
Urban BMPs Demonstration Project	Albemarle-Pamlico	Use of a constructed detention pond and an existing hardwood wetland to treat stormwater runoff from a 200 acre development site.	Ongoing	NEP Updates: Action Plan June 1990. Pg. 25
* Electric Avenue Beach Stormwater Control Project	Buzzards Bay	Demonstration project to install a stormwater infiltration system along Electric Avenue Beach for controlling pathogen discharges to shellfish and swimming areas.	Completed	Buzzards Bay Draft CCMP May 1990. Pg. 155

STORMWATER CONTROL PROGRAMS

PROJECT TITLE	PROGRAM	PROJECT DESCRIPTION	STATUS	REFERENCE
Red Brook Road Stormwater Control Project	Buzzards Bay	Demonstration project to install a stormwater infiltration system along Red Brook Road for controlling pathogen discharges to shellfish and swimming areas.	Ongoing	Buzzards Bay Draft COMP May 1990. Pg. 155
* Mamaroneck Harbor Project	Long Island	Demonstration of the effectiveness of street sweeping, catch basin cleaning, and pet waste removal ordinances for the control of stormwater runoff pollution. These BMPs were not found to be effective.	Completed	Long Island Sound Study Annual Report: 1989/1990 Pg. 28
* Merchants Millpond Demonstration Project	Albemarle-Pamlico	Implementation of conventional and unconventional agricultural BMPs for the control of runoff from animal farming operations in the Merchants Millpond watershed. Program includes technical assistance, monitoring studies, and cost-share incentives.	Ongoing	Project Abstracts for the Period 1987-1989, Albemarle-Pamlico Estuary System Oct 1988 Pg. 9
Evaluation of Hydrology and Water Quality Changes from BMP Implementation	Albemarle-Pamlico	Project to evaluate the effects of tide gates and flashboard risers on runoff and water quality immediately downstream from drained agricultural fields.	Ongoing	Project Abstracts for the Period 1987-1989, Albemarle-Pamlico Estuary System Oct 1988 Pg. 28
Manatee County Gladiolus Field Project	Sarasota Bay	Construction of three tailwater pump-back stations to reduce stormwater discharges to Sarasota Bay from a 2,100 acre gladiolus field irrigated by reclaimed wastewater.	Completed	Sarasota Bay NEP Annual Report - FY 1990 Pg. 9
* Sarasota County Stormwater Utility	Sarasota Bay	Sarasota County established a stormwater utility to provide a comprehensive stormwater management program addressing water quality and flood control. Fees are paid by residential and non-residential property owners.	Completed	Sarasota Bay NEP Annual Report - FY 1990 Pg. 9

STORMWATER CONTROL PROGRAMS

PROJECT TITLE	PROGRAM	PROJECT DESCRIPTION	STATUS	REFERENCE
Gasoline Fueling Station BMP's to Reduce Toxic Urban Runoff	San Francisco	This is a project developed by Sacramento County which will examine pollutant loading from gasoline stations. The project will determine and examine the sources of toxic urban runoff and quantify the pollutant loads. BMP's will be developed to reduce the pollutant loads.	Ongoing	San Francisco Bay Estuary Project, Project Proposal - Demonstration of Gasoline Fueling Station BMP's Designed to Reduce Toxic Pollution Loadings in Urban Runoff.
NPDES Permit for Stormwater and Urban Runoff Discharges	Santa Monica Bay	The project initiated negotiations leading to the development of the stormwater NPDES permit for Los Angeles County. The permit is tailored to the district structure of the L.A. County drainage system. It requires permittees to develop and implement and effective countywide stormwater pollution control program that would be implemented in three phases, with the entire county scheduled to be in compliance by July 1996.	Completed	SMBRP Project Update February 1991.

TOXIC WASTE REDUCTION FOR INDUSTRY, MUNICIPALITIES AND HOUSEHOLDS

PROJECT TITLE	PROGRAM	PROJECT DESCRIPTION	STATUS	REFERENCE
Black Rock Harbor Project	Long Island Sound Study	This project was conducted by the EPA and the Connecticut DEP to examine the toxic contributions of different discharge sources into Black Rock Harbor. Samples were taken during all four seasons in both dry and wet weather. The discharge points of interest were 8 CSO's, one sewage treatment plant, and 2 industrial dischargers. Results from the project indicate that the industrial dischargers contribute the most toxics to the harbor and that the toxic contamination is most prevalent in the sediments of the harbor.	Completed	Data report on the results of Toxicity tests & supporting Chemical Analysis of Environmental samples in Black Rock Harbor
Toxics Inventory Project	Albemarle/Pamlico	This project was undertaken to bridge a gap in the lack of toxicity data for the Albemarle/Pamlico study. The project will develop an inventory list of sources of toxics data and screen the data against State and Federal standards. In addition, recommendations will be made for future monitoring strategies in toxic hot spots and maps of sites having potential toxic problems will be produced.	Ongoing	Project Abstracts FY 89-90 Albemarle/Pamlico Study
* Household Hazardous Waste Program	Puget Sound	This is a two part Hazardous waste reduction program. Part one of the program is to provide funding to state counties to develop local hazardous waste management plans. Four pilot programs have been completed and all other Puget Sound counties are scheduled to complete plans by June 1991. Part two of the program is to provide educational information on less toxic alternatives for household products. Information will be in the form of articles, newsletters, and brochures.	Ongoing	Puget Sound Water Quality Management Plan, Nov 90 pg. 137

TOXIC WASTE REDUCTION FOR INDUSTRY, MUNICIPALITIES AND HOUSEHOLDS

PROJECT TITLE	PROGRAM	PROJECT DESCRIPTION	STATUS	REFERENCE
Permit Writers Manual	Puget Sound	The Department of Ecology will develop a manual containing examples and guidelines to insure that pertinent information is made available and used in preparing state and NPDES waste discharge permits. A checklist will accompany each permit application sent in by municipalities or industry to insure that all requirements of the manual and the Water Quality Management Plan were met.	Pending	Puget Sound Water Quality Management Plan, Nov 90
Discharger Fees	Puget Sound	The Department of Ecology shall levy fees on all permitted dischargers. These fees shall be in amounts so as to fully recover expenses incurred by the permitting process including inspections, lab analysis, and oversight. Initiative 97 in November 1988 implemented this permit rule with no upper limit on the statewide revenues which could be gained.	Ongoing	Puget Sound Water Quality Management Plan, Nov 90 pg. 216
Variable Permit Fee Project	Puget Sound	A project was conducted by the authority to determine the feasibility of having a variable discharge permit fee based on discharge criteria such as quantity, toxicity, persistence, and other characteristics. A variable permit fee would provide incentive for dischargers to lower toxic discharge amounts. A draft of the project results was completed in March 1990.	Completed	Puget Sound Water Quality Management Plan, Nov 90 pg. 216
Toxicant effluent limits in permits	Puget Sound	This project is an element of the overall Municipal and Industrial Discharge action plan. The objective of the project was to establish maximum toxic discharge limits in permits to control the amount of toxicants in waste discharges. Limits are currently in effect for a few permits but are yet to be incorporated into many municipal and industrial permit applications.	Ongoing	Puget Sound Water Quality Management Plan, Nov 90 pg. 210

TOXIC WASTE REDUCTION FOR INDUSTRY, MUNICIPALITIES AND HOUSEHOLDS

PROJECT TITLE	PROGRAM	PROJECT DESCRIPTION	STATUS	REFERENCE
Water Column Mixing Zones	Puget Sound	A draft set of guidelines for establishment of mixing zones in municipal and industrial wastewater discharge permits as well as for stormwater outfalls has been developed.	Ongoing	Puget Sound Water Quality Management Plan, Nov 90 pg. 215
Inspectors Manual	Puget Sound	The Department of Ecology will prepare an inspectors manual which will incorporate all components of the Water Quality Management Plan and pertinent information from other existing manuals such as those published by the EPA.	Pending	Puget Sound Water Quality Management Plan, Nov 90 pg. 218
* Urban Bay Action Teams	Puget Sound	This is a system of field task forces made up of technical staff members from planning and regulatory agencies. Each action team is responsible for pollutant source identification, regulations, and enforcement within a specific bay of the Sound.	Ongoing	Puget Sound Urban Bay Action Program: A Focused Toxics Control Strategy, Jan 90
Inspector and Permit writer Training program	Puget Sound	The Department of Ecology has established an ongoing training program for permit writers and inspectors. Minimum training requirements have been established.	Ongoing	Puget Sound Water Quality Management Plan, Nov 90 pg. 231
Toxic Substances Monitoring Network Project	Indian River Lagoon	Baseline levels of toxic organic compounds within organisms and sediments will be established at sites throughout the lagoon. Data will facilitate recommendations for future monitoring sites and for reducing significant input sources.	Pending	Indian River Lagoon FY 1991 Annual Workplan
Toxics Loading Inventory	Chesapeake Bay	The purpose of this project is to provide a quantitative amount of toxic inputs to the Bay from point and non point sources. The inventory will be reviewed and expanded every two years.	Ongoing	Chesapeake Bay Basinwide Toxics Reduction Strategy, December 1988

TOXIC WASTE REDUCTION FOR INDUSTRY, MUNICIPALITIES AND HOUSEHOLDS

PROJECT TITLE	PROGRAM	PROJECT DESCRIPTION	STATUS	REFERENCE
Toxics of Concern List	Chesapeake Bay	This program will supplement the Toxics Loading Inventory. The list will identify specific toxics that are causing or could potentially cause damage to living resources or habitats. This list will also be updated every two years.	Ongoing	Chesapeake Bay Basinwide Toxics Reduction Strategy, December 1988
* Rhode Island Hazardous Waste Reduction Program	Narragansett Bay	This is a voluntary participation program conducted by the Office of Environmental Coordination. Under the program, companies can request a hazardous waste reduction assessment of their facilities by a team of technical specialists from the OEC. The assessment team then provides the company with a formal report on how they can reduce waste production.	Ongoing	Program Brochure
Pretreatment Toxic Waste Reduction Program	Narragansett Bay	The objective of this project was to implement a technical assistance program which would encourage waste reduction practices in the electroplating industry. The focus was on pretreatment technologies for the metal and jewelry plating industry. Technical assistance included workshops, audits, site visits, and cost savings analyses.	Ongoing	Project Scope: Pretreatment Toxic Waste Reduction Program
Chlorine Toxicity Impact Assessment and Effluent Limitation Program	Narragansett Bay	An assessment of current chlorination and disinfection practices at a sewage treatment plant on Narragansett Bay was undertaken. The assessment included experimentation with different chlorine dosages and residence times. The results will be used to recommend methods for minimizing chlorine toxicity in treatment plant discharge water.	Ongoing	Project Scope: Chlorine Toxicity Impact Assessment and Effluent Limitation Program

WETLANDS/HABITAT PROTECTION AND RESTORATION ACTIVITIES

PROJECT TITLE	PROGRAM	PROJECT DESCRIPTION	STATUS	REFERENCE
Sea Grass Signage Project	Sarasota Bay	This project is aimed at the protection of the valuable Sea Grass beds in Sarasota Bay from scarring by boat propellers. Vulnerable beds were marked with signage to alert boaters of these sensitive areas. Aerial observation of these beds was conducted before and during the project to evaluate progress. Additional beds are due to be marked through July 1991.	Ongoing	NEP Updates: Sarasota Bay Sea Grass Signage Project June 1990
Seawall Shoreline Protection	Sarasota Bay	This project is aimed at educating property owners on natural alternatives to seawall installation. The program will work with permitting agencies to insure that, where possible, natural habitats are maintained.	Pending	1991 Action Plan for Sarasota Bay, Jan 1991
* City Island Habitat Project	Sarasota Bay	This project developed a 4.5 acre intertidal habitat on City Island. Intertidal pools, plants, and a nature trail are included.	Completed	Sarasota Bay Annual Report FY 1990
Leffis Key Habitat Project	Sarasota Bay	A 30 acre intertidal habitat will be developed near Coquina Beach. Approximately 10 acres of natural intertidal habitat will be restored as a result of this project.	Pending	Sarasota Bay Annual Report FY 1990

WETLANDS/HABITAT PROTECTION AND RESTORATION ACTIVITIES

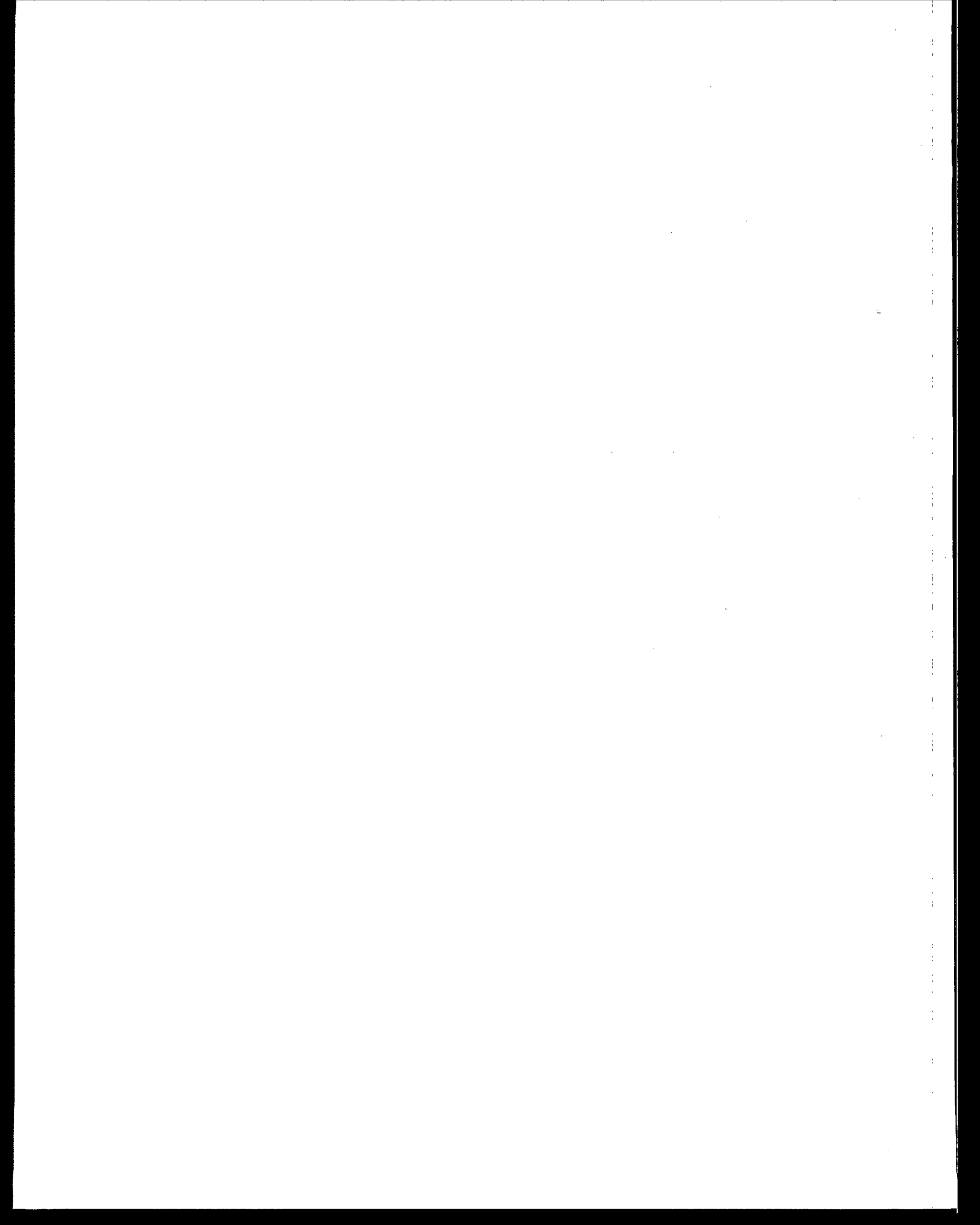
PROJECT TITLE	PROGRAM	PROJECT DESCRIPTION	STATUS	REFERENCE
New College Shoreline Project	Sarasota Bay	Students from New College removed an existing seawall along a stretch of shoreline in the bay. The shore was then returned to its natural state by planting native vegetation where the seawall was.	Completed	Sarasota Bay Annual Report FY 1990
Enhancement Plan for Ballon Lagoon Marine Preserve	Santa Monica Bay	A number of demonstration projects will be carried out to improve tidal circulation and limit public access to the Lagoon. These projects include cleanups, grading slopes, stormwater management, and landscaping. Volunteers will monitor changes in circulation, temperature, salinity, and other parameters to determine progress.	Ongoing	NEP Updates: Santa Monica Bay Enhancement Plan for Ballona Lagoon Marine Preserve June 1990
Coastal Preserve Status for Christmas Bay and Armand Bayou	Galveston Bay	This demonstration project consists of determining existing jurisdictions and regulatory inconsistencies in these bays. Based on the findings, a management plan for habitat preservation and enhancement will be developed.	Ongoing	NEP Updates: Coastal Preserve Status for Christmas Bay and Armand Bayou June 1990
Shoreline Erosion & Estuary Enhancement	Galveston Bay	Smooth cord grass is being planted along the eroding shorelines of Galveston Bay to minimize erosion and restore the fringing water habitat.	Ongoing	Galveston Bay NEP Annual Report
* Local Government Wetland Preservation Program	Puget Sound	This project will help a local government establish and carry out a wetlands preservation program. Experience and information gained in this model project will be used to develop a "how to" guidebook for use by other local governments. Monies for this project will also be used to acquire a wetland area.	Ongoing	NEP Updates: Local Government Wetland Preservation Program June 1990
* Stream Team Program	Puget Sound	This is a program made up of volunteers in the Kelsey Creek Watershed. The project has published a Stream Team Guidebook which details the goals of the program. Workshops on stream protection, cleanup, and shoreline planting have been held. This program is used as a national model for similar stream preservation efforts.	Ongoing	PIE Model Projects Fund 47 Success Stories from Pug Sound

WETLANDS/HABITAT PROTECTION AND RESTORATION ACTIVITIES

PROJECT TITLE	PROGRAM	PROJECT DESCRIPTION	STATUS	REFERENCE
Habitat Task Force	Puget Sound	A task force made up of representatives from various environmental, research, and state agencies will be established. The task force will, among other things, develop a list of priorities, programs, and protocols, and be responsible for coordination, progress tracking, and developing long term strategies for wildlife management and habitat protection.	Pending	1991 Puget Sound Water Quality Management Plan pg. 59
Wetlands Preservation Guidebook	Puget Sound	The Department of Ecology will develop a guidebook for use by local governments. The guidebook will detail how to set up a wetlands preservation program at the local level based on the results of a model program funded by the DOE.	Pending	1991 Puget Sound Water Quality Management Plan pg. 185
Obstructions to Anadromous Fish Migration	Albemarle/Pamlico	Maps depicting anadromous fish utilization areas and current impediments or blockage to fish movements were produced. These maps will be used by regulatory agencies and developers to identify areas of concern and to prevent construction action which might further degrade the fishery by restricting fish passage.	Completed	Project Abstracts 1987-89 Albemarle/Pamlico Study
* Shoreline Erosion Control Demonstration Project	Albemarle/Pamlico	This project will site and construct several low cost breakwaters to determine the best design for marsh protection while still allowing for the passage of water and organisms.	Ongoing	Draft Annual Report, May 19 Albemarle/Pamlico Study
Rare, Threatened, and Endangered Species Program	DELEP	This project addresses the problem of Habitat/Wetland loss. A working model for land use planning for local governments will be established. Critical habitat areas will be identified and mapped and put into a local planning data base. Results of the project will be transferred to all other local governments in the region.	Ongoing	Action Now Project Cumberland County Bay are Rare, Threatened, and Endangered Species Progra

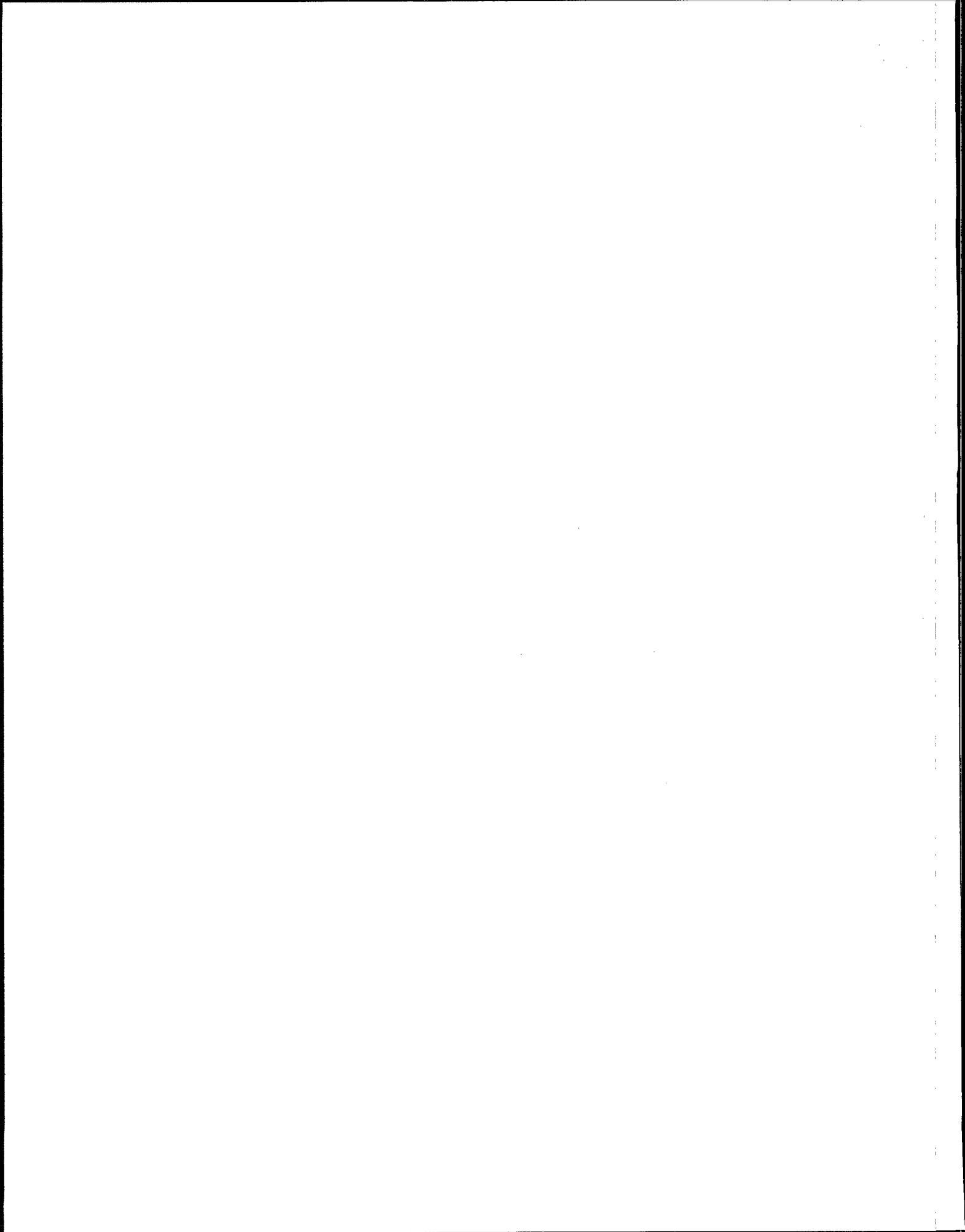
WETLANDS/HABITAT PROTECTION AND RESTORATION ACTIVITIES

PROJECT TITLE	PROGRAM	PROJECT DESCRIPTION	STATUS	REFERENCE
Coastal Marsh Enhancement	Indian River Lagoon	Restore and enhance 75 acres of Mangrove marsh habitat through reconnection of the marsh-estuary linkage. Follow up monitoring of the water quality and floral and faunal communities will be conducted.	Pending	Indian River Lagoon NEP FY 1991 Annual Work Plan May 6, 1991 Pg. 7
Least Tern Colony Project	Santa Monica Bay	This program is attempting to establish a new breeding colony for an endangered water bird, the least tern. A new protected site has been set aside to allow for population expansion from a nearby breeding colony.	Ongoing	SMBRP Project Update, February 1991.



Appendix A

Matrix of Projects by Category



PROJECT TITLE	PROGRAM	STATUS	TOPICS											
			Wetlands/Habitat Protection & Restoration	Stormwater Controls	Contaminated Sediments	Toxic Waste Reduction	Nutrient Loading	Public Outreach	Local Involvement/Tech Assistance	Land Use	On-Site Waste Disposal	Boat Waste	Riparian Zone Protection	Shellfish Bed Protection
Where the Rivers Meet the Sea	Albemarle/Pamlico	C						X						
State of the Estuary T.V. Public Service Campaign	Albemarle/Pamlico	O						X						
A Guide to the Estuaries	Albemarle/Pamlico	C						X						
Citizens Water Quality Monitoring Network	Albemarle/Pamlico	C							X					
A Citizens Guide to Coastal Water Resources Mgmt.	Albemarle/Pamlico	C							X					
Virginia Animal Waste Management	Albemarle/Pamlico	C					X							
North Carolina Animal Waste Management	Albemarle/Pamlico	O					X							
Nitrogen and Phosphorus Removal in Coastal Swamps	Albemarle/Pamlico	O					X						X	
Bay Scallop Mitigation Project	Albemarle/Pamlico	O											X	
Trawl Excluder Device Evaluation	Albemarle/Pamlico	C												
MERCANTILE MILL POND DEMO PROJECT	Albemarle/Pamlico	O		X										
Evaluation of Hydrology and Water Quality Changes from BMP Implementation	Albemarle/Pamlico	O		X										
Toxics Inventory Project	Albemarle/Pamlico	O				X								
Obstructions to Anadromous Fish Migration	Albemarle/Pamlico	C	X											
SHORELINE EROSION CONTROL DEMO PROJECT	Albemarle/Pamlico	O	X											
Urban BMPs Demonstration Project	Albemarle/Pamlico	O		X										
Marine Craft Discharge Project	Buzzards Bay	C						+			X			
Solar Aquatics Treatment	Buzzards Bay	C									X			
Mobile Marine Pumpout Program	Buzzards Bay	O									X			
New Bedford Sanitary Waste & oil pumpout facilities	Buzzards Bay	O									X			
NONPOINT SOURCE CONTROL A GUIDANCE DOCUMENT FOR LOCAL OFFICIALS	Buzzards Bay	C		+							X	+		
COALITION FOR BUZZARDS BAY	Buzzards Bay	C									X			
BUZZARDS BAY ACTION COMMITTEE	Buzzards Bay	C									X			
Community Migrant Program	Buzzards Bay	O									X			
Financial Planning Guidebook	Buzzards Bay	C									X			
Marion Citizen Monitoring Program	Buzzards Bay	C									X			
Fairhaven Migrant Project	Buzzards Bay	C									X			
PORTSMOUTH WATER QUALITY MANAGEMENT PLAN	Buzzards Bay	C										X		
NITROGEN OVERLAY DISTRICT	Buzzards Bay	O					X				+			
ELECTRIC AVEREACH STORMWATER CONTROL	Buzzards Bay	C												
Red Brook Road Stormwater Control Project	Buzzards Bay	O		X										
MANAGEMENT OF SANITARY WASTES	Buzzards Bay	C		X									X	

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MD Critical Area Legislation	Chesapeake	O								X					
VA Chesapeake Bay Preservation Act	Chesapeake	O								X					
Phosphate Detergent Bans	Chesapeake	C					X								
Sewage Plant Upgrades	Chesapeake	O					X								
Expansion of Sewer Districts	Chesapeake	O					X								
GSO Swift Concentrator-Anacostia River	Chesapeake	O		+			X								
MARYLAND AGRICULTURAL COST SHARE	Chesapeake	O					X								
PA Planning Assistance Funding Program	Chesapeake	O					X								
PA Financial Assistance Funding Program	Chesapeake	O					X								
PA State Conservation Commission BMP Development	Chesapeake	C		+			X								
PA Technical Assistance Funding Program	Chesapeake	O					X								
CRP Incentive Program	Chesapeake	O					X								
PA Manure Management Manual	Chesapeake	O					X								
PA Agricultural Nutrient Management Program	Chesapeake	O					X								
HRSD-New York River WWTF BNR Demonstration Project	Chesapeake	C					X								
Kilmarnock WWTF BPR Demonstration Project	Chesapeake	C					X								
Fredericksburg WWTF Simultaneous Chemical Precipitation	Chesapeake	C					X								
VA Water Quality Standards	Chesapeake	C					X								
Point Source Policy for Nutrient Enriched waters	Chesapeake	C					X								
DC Waite Branch bank stabilization project	Chesapeake	O		X											
River Terrace stormwater demonstration project	Chesapeake	O		X											
MD State Stormwater Regulations	Chesapeake	O		X											
MD STORMWATER COST SHARE	Chesapeake	O		X											
Toxics Loading Inventory	Chesapeake	O				X									
Toxics of Concern List	Chesapeake	O				X									
Agricultural Stormwater Management Project	Delaware Inland	O		X			+								
Fact Sheets	DELEP	O						X							
Map Oriented Brochure	DELEP	C						X							
Annual Awards Banquet	DELEP	P						X							
Estuary Field Trips	DELEP	P						X							
LINK Data Base	DELEP	P						X							
LEGISLATIVE LIAISON PROJECT	DELEP	O						X	+						
Hands on Projects	DELEP	P						X							
Clean up the Estuary Day	DELEP	P						X	+						

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Storm Drainage Cleanup Day	DELEP	P						X							
Annual Group Conference	DELEP	P						X							
1-800-ESTUARY Project	DELEP	C						X							
Touring Dramatic School Presentations	DELEP	P						X							
Oil Recycling at Service Stations	DELEP	P						X							
Estuary Library	DELEP	P						X							
School Outreach	DELEP	P						X							
Lecture Series and Workshops	DELEP	O						X							
Corporate Partnerships	DELEP	P						X							
Beautiful Bays Calendar	DELEP	P						X							
Estuary Poster/Brochure	DELEP	C						X							
Travelling Exhibitions	DELEP	P						X							
Video Grant Program	DELEP	C						X							
Slide Show Video Tape	DELEP	P						X							
Estuary Trivia	DELEP	P						X							
The Estuary Radio Program	DELEP	P						X							
Public Service Announcements	DELEP	O						X							
Press Cruises	DELEP	P						X							
DELEP LOCAL GOV'T COMMITTEE	DELEP	O							X						
Increase Oyster Production Program	DELEP	O												X	
Red Clay Creek Demonstration Project	DELEP	O		X											
Gloucester County Water Conservation and	DELEP														
Water Quality Program	DELEP	O		X											
Rare, Threatened, and Endangered Species Program	DELEP	O	X												
Speakers Bureau	Galveston Bay	O						X							
Galveston Bay Information Center	Galveston Bay	O						X							
Coastal Preserve Statue for Christmas Bay and	Galveston Bay														
Armand Bayou	Galveston Bay	O	X												
Shoreline Erosion and Estuary Enhancement	Galveston Bay	O	X												
Coastal Marsh Enhancement	Indian River Lagoon	P	X												
Chemical Mixing Centers	Indian River Lagoon	P		X			X								
Toxic Substances Monitoring Network Project	Indian River Lagoon	P													
Biological Nutrient Removal Project	Long Island Sound	O													
NPS Nitrogen Project	Long Island Sound	O													

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MAMARONECK HARBOR PROJECT	Long Island Sound	C		X											
Black Rock Harbor Project	Long Island Sound	C				X									
RI HAZARDOUS WASTE REDUCTION PROGRAM	Narragansett Bay	O				X									
LAND MANAGEMENT PROJECT	Narragansett Bay	O								X					
Pretreatment Toxic Waste Reduction Program	Narragansett Bay	O				X									
C12 Toxicity Impact Assessment & Effluent Limitation Prog.	Narragansett Bay	O				X									
Library Reference Collection	NY-NJ Harbor	O						X							
Video Documentary	NY-NJ Harbor	O						X							
Citizens Lifestyle Guide	NY-NJ Harbor	O						X							
NJ MARINE DEBRIS RECYCLING PROJECT	NY-NJ Harbor	C						+				X			
New York Marine Debris Handling and Recycling Project	NY-NJ Harbor	C						+				X			
Public Education	Puget Sound	O						X							
Ferries Presentations	Puget Sound	O						X							
Wildlife Habitat Education	Puget Sound	P						X							
Newseletter	Puget Sound	O						X							
TEACHER TRAINING PROGRAM	Puget Sound	O						X							
Habitat Protection	Puget Sound	P						X							
School and Citizens Monitoring Program	Puget Sound	O						X							
Post Secondary Monitoring Program	Puget Sound	P						X		+					
Campaigns for Puget Sound	Puget Sound	P						X							
Year of the Sound Program	Puget Sound	P						X							
Sound Waters Award Program	Puget Sound	P						X							
Internships and Credit Program	Puget Sound	P						X							
Water Quality Directory and Info Hotline	Puget Sound	O						X							
Short Course on Local Planning	Puget Sound	P						X							
Pollution Prevention Program	Puget Sound	O						X		+					
MARINE DEBRIS DEMONSTRATION PROJECT	Puget Sound	C						+				X			
Boater Education Project	Puget Sound	C										X			
Local Government Water Quality Finance Guidebook	Puget Sound	P						+				X			
INTERAGENCY TECHNICAL ASSISTANCE TEAM	Puget Sound	C							X		+				
Shellfish Protection and Restoration Policy	Puget Sound	O												X	
Commercial Shellfish Bed Restoration and Protection	Puget Sound	O												X	
Public Involvement and Education	Puget Sound	O						+						X	
Operation and Maintenance Prog. & Runoff Ordinances	Puget Sound	P		X											

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Stormwater Management Programs for Urbanized Areas	Puget Sound	O		X											
	Puget Sound	O		X											
	Puget Sound	O		X											
	Puget Sound	O		X											
	Puget Sound	O		X											
	Puget Sound	O		X											
	Puget Sound	P		X											
	Puget Sound	C		X											
	Puget Sound	C		X											
	Puget Sound	C		X											
HOUSEHOLD HAZARDOUS WASTE PROGRAM	Puget Sound	C			X										
	Puget Sound	O			X										
	Puget Sound	P													
	Puget Sound	O				X									
	Puget Sound	C				X									
	Puget Sound	O				X									
	Puget Sound	P				X									
	Puget Sound	O				X									
	Puget Sound	O				X									
	Puget Sound	O				X									
URBAN BAY ACTION TEAMS	Puget Sound	O													
	Puget Sound	O													
	Puget Sound	O													
	Puget Sound	O													
	Puget Sound	P													
	Puget Sound	P													
	Puget Sound	O													
	Puget Sound	O													
	Puget Sound	O													
	Puget Sound	O													
ARTIFICIAL WETLANDS STORMWATER CONTROL	San Francisco	O		X											
	San Francisco	O		X											
	San Francisco	O		X											
	Santa Monica Bay	O													
	Santa Monica Bay	O	X												
	Santa Monica Bay	C									X				
	Santa Monica Bay	O									X				
	Santa Monica Bay	O									X				
	Santa Monica Bay	P									X				
	Santa Monica Bay	C		X											
SARAGOTA WASTEWATER RECLAMATION	Santa Monica Bay	O													
	Santa Monica Bay	O		X											
	Santa Monica Bay	O	X												
	Santa Monica Bay	C													
	Santa Monica Bay	O													
	Santa Monica Bay	O													
	Santa Monica Bay	O													
	Santa Monica Bay	O													
	Santa Monica Bay	O													
	Santa Monica Bay	O													

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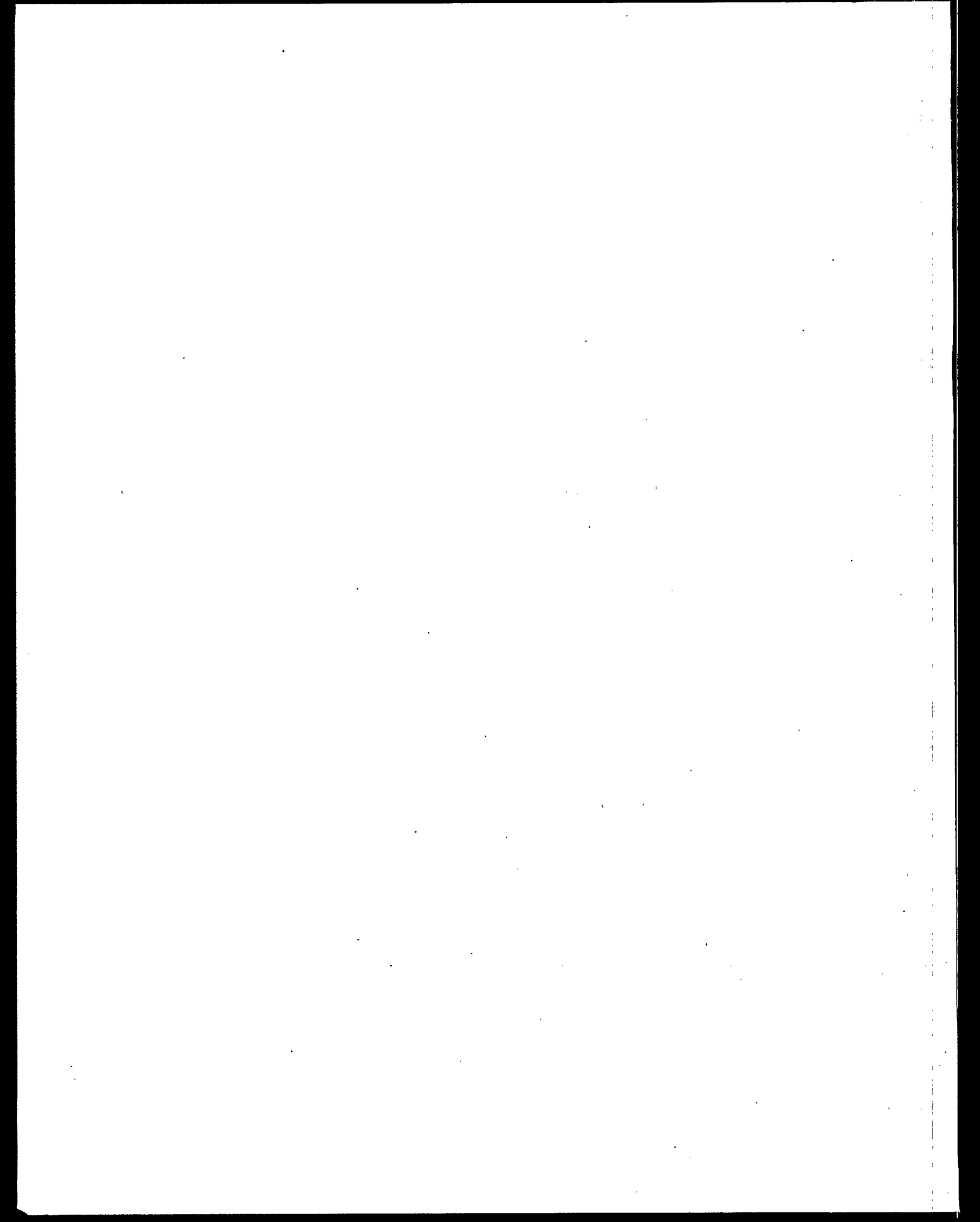
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			Wetland/Habitat Protection & Restoration	Stormwater Controls	Contaminated Sediments	Toxic Waste Reduction	Nutrient Loading	Public Outreach	Local Involvement/Tech Assistance	Land Use	On-Site Waste Disposal	Boat Waste	Riparian Zone Protection	Shellfish Bed Protection	
Clower Creek Stormwater Control Project	Sarasota Bay	O		X											
Manatee County Gladiolus Field Project	Sarasota Bay	C		X											
SARASOTA COUNTY STORMWATER UTILITY	Sarasota Bay	C		X											
On-Site Septic Tank Mapping	Sarasota Bay	P								X					
Sea Grass Signage Project	Sarasota Bay	O	X												
Seawall Shoreline Protection	Sarasota Bay	P	X												
CITY ISLAND HABITAT PROJECT	Sarasota Bay	C	X					+							
Lefts Key Habitat Project	Sarasota Bay	P	X												
New College Shoreline Project	Sarasota Bay	C	X												
Stormwater Runoff Information Program	Tampa Bay	P		+				X							
Boater Education Project	Tampa Bay	P						X		+		+			

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Appendix B

References



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