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Report on Goals For the
Future of Narragansett Bay 53pp

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Narragansett Bay Estuary Program

REPORT ON GOALS
FOR
THE FUTURE OF NARRAGANSETT BAY

Prepared for:

The Narragansett Bay Project

By:

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FOREWORD

The United States Congress created the National Estuary Program in 1984, citing its concern for the "health and ecological integrity" of the nation's estuaries and estuarine resources. Narragansett Bay was selected for inclusion in the National Estuary Program in 1985 and the Narragansett Bay Project (NBP), a multi-year study of the Bay and its resources, was established. Under the joint sponsorship of the U.S. Environmental Protection Agency and the Rhode Island Department of Environmental Management, the NBP has involved participation by local, state, and federal agencies, the academic community, and local interest and user groups. The purpose of the Narragansett Bay Project is first to identify and evaluate pollution problems and causes in the Bay through a five-year plan of scientific research. Based on the results, the NBP will then develop a comprehensive management plan by December, 1990, which will recommend actions to improve and protect the Bay from further degradation.

In March, 1988, the Administrator of EPA and the Governor of Rhode Island signed an agreement officially designating Narragansett Bay as an "estuary of national significance". The State of Rhode Island pledged to make a good faith effort to institute whatever corrective actions are recommended by the management plan as necessary to protect the Bay. The EPA will continue to support the NBP through 1995 for the express purpose of overseeing implementation of the recommended actions and monitoring their effectiveness. After 1995, the State of Rhode Island will assume responsibility for implementation of the management plan to protect the Bay and its resources for future generations.

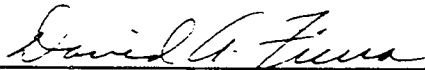
The NBP has established the following seven priority issues for Narragansett Bay:

- * management of fisheries
- * nutrients and potential for eutrophication
- * impacts of toxic contaminants
- * health and abundance of living resources
- * health risk to consumers of contaminated seafood
- * land-based impacts on water quality
- * recreational uses

The NBP is taking an ecosystem approach to address these problems and has funded research that will help to improve our understanding of various aspects of these priority problems. The Project is also working to expand and coordinate existing programs among state agencies, governmental institutions, and academic researchers in order to apply research findings to the practical needs of managing the Bay and improving the environmental quality of its watershed.

This report represents the technical results of an investigation performed for the Narragansett Bay Project. The information in this document has been funded wholly or in part by the United States Environmental Protection Agency under assistance agreement #CX812680 to the Rhode Island Department of Environmental Management. It has been subject to the Agency's and the Narragansett Bay Project's peer and administrative review and has been accepted for publication by the Management Committee of the Narragansett Bay Project. The results and conclusions contained herein are those of the author(s) and do not necessarily represent the views or recommendations of the NBP. Final recommendations for management actions will be based upon the results of this and other investigations.

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REPORT ON GOALS
FOR THE FUTURE OF
NARRAGANSETT BAY

Between January 20 and February 23, 1987, a total of 61 participants representing a broad range of individuals with a variety of interests in the future of Narragansett Bay held a series of meetings to discuss and identify what they viewed as important goals for the Narragansett Bay Project. The participants met first in six separate groups comprised of individuals with similar interests in the Bay. They subsequently came together in two general workshops to share their views of feasible goals and develop a consensus over priorities for all of the goals identified by the separate groups. Finally, the participants responded to a series of questions relating to their ranking of priorities designed to refine further some of their choices.

Being eminently pragmatic people, the participants identified, in addition to goals, a series of means for the accomplishment of identified ends. They also articulated some overriding principles for their goal-setting exercise.

What follows is a summary of the work of the participants divided into three sections: goals, means and principles.

GOALS

The goals identified here were arrived at through a repeated process of discussion and synthesis. Each separate group met to discuss and identify its goals which were then reduced to a list. All of the resulting lists were then shared and discussed in the first general workshop, from which a new list emerged. The list generated by the full group was divided into subject categories but otherwise faithfully and precisely reflected the input of the participants. At the final workshop, after the importance of distinguishing between ends and means was emphasized, the participants divided into four mixed groups, each of which was charged with generating another list of goals reflecting the group's priorities.

The following summary represents a synthesis of the work of the four groups at the second workshop. It also incorporates the responses of participants to the final questionnaire distributed along with the draft summary to pin down more accurately some of their preferences.

Because each group tackled the task of setting priorities differently, it was not easy to compile a summary both fully faithful to the participants' input and useful to the Management Committee of the Narragansett Bay Project. By using a further refined version of the subject categories that emerged after the first workshop, each category was assigned a priority, based on the extent of unanimity about its importance among the four groups and the responses of all participants, regardless of group, to the questionnaire, as follows:

1. Water quality
2. Water and waterfront uses
3. Enforcement
4. Land use
5. Access
6. Education
7. Evaluation
8. Some specific goals

This numerical rating suggests a precision and clarity of ranking among the categories that did not exist. While water quality was consistently regarded as the most important category by the participants, the categories of uses, enforcement, land use and access competed more or less equally for second place. Education was a latecomer to the list of goals, and, similarly, evaluation issues were a relatively late development, difficult to distinguish from pragmatic means to accomplish goals. The specific goals identified by the participants elicited support throughout the process and resisted successfully efforts to subsume them within broader or more general categories. Thus, the following materials suggest less a strict hierarchy of values than the relative importance of the categories, no small achievement given the diversity and tenacity of the participants.

The participants made several attempts to articulate a broadly inclusive statement of overall goals for Narragansett Bay, but could not agree on a formula acceptable to all. Two competing statements emerged that commanded wide support:

- Preserve and promote the environmental quality of

Narragansett Bay, including its biological, chemical, physical and socio-economic aspects.

- Preserve a healthy Narragansett Bay for posterity so our children may enjoy some of the same benefits we have derived from the Bay.

Category 1: Water Quality

Participants were able to identify clearly three specific goals related to water quality:

- The present status of Narragansett Bay ought to serve as a "bottom line"; hereafter efforts should focus on the prevention of further deterioration and incremental improvement with the eventual goal of restoring the Bay to a better state of health enjoyed at some earlier point.

- Protect brood stocks and breeding areas; maintain the long-term quality of the habitat and the Bay's resources.

- Ensure the continued availability of safe, quality seafood products that do not threaten public health.

The first of these three goals reflects the participants' adamant determination that further degradation of the Bay must cease, while hinting at some uncertainty about how much reclamation or rehabilitation is possible and feasible. The other two goals reflect the importance the participants placed on shell-fishing, which emerged in responses to the questionnaire as the premier use of the Bay among participants.

Category 2: Water and Waterfront Uses

In this category there were two general or broad goals:

- Recognize, evaluate and accommodate competing interests for uses of the Bay and its shoreline.

- Preserve, protect and enhance water-dependent uses of waterfront property.

The participants' responses to the questionnaire clarified their preferences for competing uses of the Bay and its shoreline. As just indicated, the highest priority for use of the Bay, by a significant margin, went to shell-fishing, followed at a distance by swimming, boating and fin-fishing. Among preferences for potential use of the shoreline, recrea-

tional development led all others, while residential development and water-dependent industrial/commercial development logged a distant and roughly equal second.

When asked what percentage of presently undeveloped shoreline of the Bay participants would choose to see developed between now and the year 2000, the average response was twelve percent (12%). And, by an overwhelming margin (better than three to one), participants felt that all shoreline residential development should be conditioned on providing public shoreline access.

Category 3: Enforcement

Comments on the draft goals and questionnaire responses led to the separation and emphasis accorded in this final version to enforcement. The goal relative to enforcement was stated as follows:

- Develop effective local, state and federal governmental mechanisms and resources for enforcing clearly and consistently statutes and regulations pertinent to the Bay.

Among the broad approaches to the problems of Narragansett Bay suggested by the goals, participants identified the provision of clear and consistent enforcement of existing laws and regulations as the most important in their responses to the questionnaire. As one participant observed in commenting on the draft goals:

"There was a consensus that fair and reasonable enforcement of existing law and regulations would have an immediate beneficial effect on water quality and resource protection in Narragansett Bay."

Category 4: Land Use

Participants identified two goals relating to land use issues:

- Focus efforts on land and water resource management in the one million acres of watershed that feeds Narragansett Bay, as well as the Bay itself; develop and implement ways of controlling non-point sources of pollution and soil erosion.

- For present uses and to accommodate shifting

shorelines, preserve landscape features like marshes, wetlands and barrier beaches.

One participant insisted that the protection of breeding stocks and habitats and the continued availability of safe seafood, both water quality goals ranked much higher by the participants, are essentially dependent for their realization on our ability to understand and control non-point sources of pollution.

All of the participants, given the opportunity in the questionnaire to identify areas after water quality the Narragansett Bay Project ought to address, selected the protection of shoreline features as the next priority for consideration.

Category 5: Access

The goal on access was stated as follows:

- Promote access to the Bay; preserve passive and active recreational success to the Bay; preserve and expand scenic access as well.

Access as a priority slipped a notch between the draft and this final report on the basis largely of responses to the questionnaire, in which participants identified both uses of the Bay and land use issues as more important for the Narragansett Bay Project to address than access. This indicates, perhaps, not that access was less highly regarded as a general goal for the Bay, but that in the context of goals for this research project on the Bay, access assumed a somewhat reduced priority.

Category 6: Education

Participants reiterated consistently the importance of education to the future of the Bay and expressed their goal in this area as follows:

- Educate the public about the value and resources of the Bay system; create an informed citizenry that understands how its direct and indirect actions affect the Bay.

Interestingly, numerous participants pointed out that the general public is remarkably sensitive to and concerned about the present and future health of the Bay; it is the poli-

tical structure that remains ignorant about and indifferent to Bay issues. The singular failure, for example, of invited legislators to participate in this goals-setting process, despite repeated invitations to do so, was cited as symptomatic of political alienation. Consequently, some urged an effort to educate elected officials about the importance and benefits of the Bay and its central place in the Rhode Island economy and culture.

Category 7: Evaluation

Because the goals workshops were specifically interested in generating goals for the Narragansett Bay Project, considerable attention was devoted to research and evaluation issues. The participants, however, had great difficulty sorting out ends from means within this category, but they were unwilling to forego identifying the development of resources for evaluating conditions and predicting change as a vital goal for the future of Narragansett Bay. The result was the generation of three broad goals with some overlap:

- Develop tools to evaluate the comparative health of the Bay and predict the impact of change on the Bay.
- Use evaluation and predictive tools to focus management attention on parts of Narragansett Bay and its watershed; learn enough about the Bay, its environs and its uses to make better decisions about its uses.
- Monitor closely toxicity to marine organisms as a key indicator for avoiding a major upset of the ecosystem; know when major negative changes have occurred in the Bay.

Responses to the questionnaire made clear that most participants viewed measurement of the magnitude of various pollution sources and a description of baseline conditions as the two most important research needs. In addition, several participants emphasized in their comments on the draft the importance of creating predictive models for the Bay as key to its future health.

Category 8: Some Specific Goals

While the preceding goals are expressed in relatively sweeping terms, the participants also identified five more specific goals, including:

- Provide for acceptable recreational uses of the Bay, including swimming and boating.

While shell-fishing received the highest priority, participants were also interested in and concerned about swimming and boating and other recreational uses of the Bay.

- Provide a safe, environmentally acceptable disposal site for clean dredge materials in the Bay.

While a few participants dissented from this goal's call for the disposal of dredge materials within the Bay and argued for extra-estuarine disposal, people were unanimous in acknowledging the need to address and resolve the dredging issue. In responses to the questionnaire, participants by a margin of five to one expressed themselves in favor of dredging even if a safe, environmentally acceptable disposal site for clean dredge materials in the Bay were to cause temporary (say three to six months) disruption of shell-fishing and fin-fishing in an area of the Bay.

- Develop a permanent capability, a Narragansett Bay Institute, to carry on and coordinate future research.

Participants expressed a strong interest in the perpetuation of the work undertaken on an ad hoc basis by the Narragansett Bay Project. The need for an institutional voice to articulate the needs and interests of the Bay, whether scientific, economic, social, or political, was frequently reiterated.

- Increase the volume of shipping use of Providence and Quonset ports.

Two participants urged the endorsement of a study of the feasibility of this goal rather than the direct goal, but participants in general adopted this specific goal first identified, naturally enough, by the group representing industry.

- Develop marine-related industry, like shipyards, in appropriate areas.

This last specific goal reflects the fact that workshop participants, contrary to the expectations of some, were uninterested in engaging in industry-bashing. Responses to the questionnaires indicated that participants, by a better than three to one margin, would approve the siting in Rhode Island of a general industry that uses toxic materials or substances if it met all applicable pretreatment requirements.

MEANS

The participants, particularly early in the process, identified an array of means to accomplish the goals identified as important, which can be categorized as follows:

Develop Information or Data:

Develop a grid system of use maps for the Bay shoreline.

Develop new criteria, other than coliform counts, to measure pollution; develop new tools for the quick measurement of pollution levels.

Develop a thorough survey and analysis of uses of the water and shoreline.

Develop an access guide plan.

Determine uses of the Bay (or portions of the Bay) that people are willing to support; develop standards that look to uses as well as water quality.

Identify strategic, important points of public access, especially for inexpensive and passive recreation such as viewing, walking, bird watching.

Inventory uses along the shoreline, especially of the upper Bay; identify sites not in use and, where possible, acquire them to provide public access.

Develop information on pollution for swimming; create a chart of swimmable and non-swimmable areas provided weekly on television weather programs.

Assess damages from toxics and non-point sources of pollution.

Conduct an inventory of existing waterfront access.

Regulations and Enforcement:

Define "commercial" and "recreational" fishing and impose and enforce regulations embracing the distinctions between the two.

Enforce more tightly pretreatment regulations and programs to reduce the discharge of toxics into the Bay.

Look at coastal regulatory efforts in other states with successful, long-term programs to develop better, tighter laws and regulations.

Strengthen DEM and CRMC to make them more effective.

Curtail pirate dumping of toxic and other hazardous wastes.

Develop a Bay Watch 1-800-number to report violations.

Reduce the length of time it takes CRMC to respond to permit requests.

Have regulatory agencies handle industrial project proposals on an expedited basis, giving them priority, for example, over residential projects.

Set priorities on the importance and enforcement of different environmental regulations.

Education:

Increase public awareness of Bay-related issues by focusing in on school systems.

Other Specific Actions:

Develop a dredge material disposal site in the Bay that is open for ten years subject to effective monitoring; open a dialogue between interests on both sides of dredging issue without government participation.

Develop recycling and resource recovery as alternatives to landfill disposal with its ultimate damage to the Bay.

Develop zoning enabling legislation.

Promote greater dialogue between the scientific and research community and policy makers.

PRINCIPLES

The participants were able to identify and articulate the following general statements of principle, ranging from the highly specific to the extremely broad. The list summarizes statements of principle and is not intended to suggest priorities:

Treat the Bay as an ecosystem; recognize that where damaging events occur in the Bay is important, but even confined activity has an impact on the whole ecosystem.

There is need for a better understanding of the subjectivity of views of water quality among different users of the Bay, depending on their specific uses.

The focus should be on development as the key "industry" with adverse future impact on the Bay.

Recognize that water quality is the key and most critical factor for the future of Narragansett Bay.

Recognize that continuous development at present rates means that the increase of non-point source pollution will swamp point-source improvements.

Remember that the Bay is an important economic asset and that the creation and maintenance of business uses of the Bay must be considered. Any effort to rehabilitate the Bay must also address the problem of cost.

There needs to be much greater understanding of the biological, chemical and physical nature of the Bay, focusing on:

- A holistic view of the Bay as an ecosystem greater than the sum of its parts or segments
- The dynamic, synergistic nature of the constantly changing Bay
- The establishment of a system of gradients that reflect the Bay's complexity, diversity and dynamism
- An assessment of damages related to anticipated and/or desired uses
- Linkages and interactions among various components of change

- The impact of natural and normal changes (seasonal, winds, light, temperature) versus man-induced changes.

The following documents developed during this process for identifying goals are attached to this report:

- Project
- Appendix A: Statement of Goals for the Narragansett
 - Appendix B: Preliminary Interest Group Goals
 - Appendix C: Goals Questionnaire with Response Results
 - Appendix D: List of Participants by Groups

APPENDIX A

Statement of Goals
for the
Narragansett Bay Project

APPENDIX A

Statement of Goals for the Narragansett Bay Project

Overall Purpose Statement:

Preserve and promote the environmental quality of Narragansett Bay, including its biological, chemical, physical and socio-economic aspects; preserve a healthy Narragansett Bay for posterity so our children may enjoy some of the same benefits we have derived from the Bay.

GOALS

Category 1: Water Quality

- The present status of Narragansett Bay ought to serve as a "bottom line"; hereafter efforts should focus on the prevention of further deterioration and incremental improvement with the eventual goal of restoring the Bay to a better state of health enjoyed at some earlier point.
- Protect brood stocks and breeding areas; maintain the long-term quality of the habitat and the Bay's resources.
- Ensure the continued availability of safe, quality seafood products that do not threaten public health.

Category 2: Water and Waterfront Uses

- Recognize, evaluate and accommodate competing interests for uses of the Bay.
- Preserve, protect and enhance water-dependent uses of waterfront property.

Category 3: Enforcement

- Develop effective local, state and federal governmental mechanisms and resources for enforcing clearly and consistently statutes and regulations pertinent to the Bay.

Category 4: Land Use

- Focus efforts on land and water resource management in the one million acres of watershed that feeds Narragansett Bay, as well as the Bay itself; develop and imple-

ment ways of controlling non-profit sources of pollution and soil erosion.

- For present uses and to accommodate shifting shorelines, preserve landscape features like marshes, wetlands and barrier beaches.

Category 5: Access

- Promote access to the Bay; preserve passive and active recreational access to the Bay; preserve and expand scenic access as well.

Category 6: Education

- Educate the public about the value and resources of the Bay system; create an informed citizenry that understands how its direct and indirect actions affect the Bay.

Category 7: Evaluation

- Develop tools to evaluate the comparative health of the Bay and predict the impact of change on the Bay.
- Use evaluation and prediction tools to focus management attention on parts of Narragansett Bay and its watershed; learn enough about the Bay, its environs and its uses to make better decisions about its uses.
- Monitor closely toxicity to marine organisms as a key indicator for avoiding a major upset of the ecosystem; know when major negative changes have occurred in the Bay.

Category 8: Some Specific Goals

- Provide for acceptable recreational uses of the Bay, including swimming and boating.
- Provide a safe, environmentally acceptable disposal site for clean dredge materials in the Bay.
- Develop a permanent capability, a Narragansett Bay Institute, to carry on and coordinate future research.
- Increase the volume of shipping use of Providence and Quonset ports.
- Develop marine-related industry, like shipyards, in appropriate areas.

APPENDIX B

Narragansett Bay Project

Goals Mediation

Preliminary

Interest Group

Goals

Group A (Commercial Users)

Group A met on January 20, 1987 and after a spirited discussion identified numerous goals. The following list is divided into three broad groupings that reflect the major categories of concerns and goals identified by the participants. Within each category, short-term goals are listed first, followed by long-term goals. The listing in no way reflects the priorities of the participants.

Commercial Fishermen

Define "commercial" and "recreational" fishing and impose and enforce regulations embracing the distinctions between the two.

Ascertain the least ecologically disruptive time for dredging operations.

Develop a grid system of accurate maps for the Bay shoreline.

Clear, consistent enforcement of existing regulations and rules, like those for the size of catch and use of certified areas.

Expand the surface area open to all kinds of commercial fishing operations by cleaning up pollution.

Ensure continued availability of safe, quality seafood products.

Protect brood stock and breeding areas.

Enhance present seafood resources; develop new ones. Be responsive, in this, to opportunities and dislocations caused by the process of cleaning up.

Marinas, boat-builders

Distinguish dredge "materials" from dredge "spoils."

Recognize marinas for their role in preserving access to the Bay.

Provide a safe, environmentally acceptable in-water disposal site for clean dredge materials. Goal is a site that

is open for ten years subject to effective monitoring. Open a dialogue between interests on both sides of dredging issue without government participation.

Make regulation of development through the permitting process rational and timely.

Ease developmental pressures on marinas and the waterfront.

Limit development by requiring that proposed projects preserve, protect and enhance water dependent uses.

General

Develop new criteria, other than coliform counts, to measure pollution; develop new tools for the quick measurement of pollution levels.

Determine the source and extent of pollution of the Bay.

Clean up sewerage treatment plants.

Don't overprotect the Bay; use the principle of mitigation to offset threatened harm to the Bay.

Encourage the private sector to assume a greater role in cleaning up the Bay.

Educate the public about the dangers to the water quality of the Bay.

Group B (Recreational & Environmental)

Group B met on February 3, 1987 and identified a variety of goals. The following list is divided into two broad categories that reflect the concerns discussed by the participants. The listing does not reflect the priorities of the participants.

Water Quality

Preserve a healthy Narragansett Bay for posterity, so our children may share some of the same benefits we have derived from the Bay.

Treat the Bay as an ecosystem; recognize that where damaging events occur in the Bay is important, but even confined activity has an impact on the whole ecosystem.

The present status of the Bay ought to serve as a "bottom line"; hereafter efforts should focus on the prevention of further deterioration and incremental improvement of the status.

Develop a better understanding of the subjectivity of views of water quality among different users of the Bay, depending on their specific uses.

Focus on development as the key "industry" with adverse future impact on the Bay.

Work to preserve the habitat of organic resources in and around the Bay.

Recognize that water quality is the key and most critical factor for the future of Narragansett Bay.

Access

Develop a thorough survey and analysis of uses of the water and the shoreline.

Develop sufficient economic resource information to quantify the benefits of water and wetlands and the losses and costs occasioned by their degradation.

Preserve passive and active recreational access to the Bay; preserve and expand scenic access as well.

Find a way to accommodate and balance competing interests for access to and use of the Bay.

Recognize the difficulty of balancing access and concerns over water quality.

Control access through efficient, responsive and effective enforcement of existing regulations governing shoreline development.

Group C (Regulatory Agencies).

Group C met on February 4, 1987 and identified a variety of goals. The following list is divided into two broad categories that reflect the major concerns identified by the participants. The list does not reflect their priorities among the various goals.

Water Quality

Recognize the the Bay must be treated as an ecosystem, yet understand that it may be impossible to rehabilitate some portions by restoring them to some specific earlier status.

Maintain the long-term quality of the habitat.

Determine uses of the Bay (or portions of the Bay) that people are willing to support. Develop standards that look to uses as well as water quality.

Monitor closely toxicity to marine organisms as a key indicator for avoiding a major upset of the ecosystem.

Protect public health through the allocation of adequate resources to enforce already strict shellfishing standards.

Enforce more tightly pretreatment regulations and programs to reduce the discharge of toxics into the Bay.

Develop recycling and resource recovery as alternatives to landfill disposal with its ultimate damage to the Bay.

Develop safe, acceptable sites for the disposal of dredging materials.

Land Use

Focus efforts on the one million acres of watershed that feed Narragansett Bay, as well as the Bay itself; assess the costs of, and develop ways of controlling, soil erosion and non-point sources of pollution; preserve landscape features of the watershed, such as marshes and wetlands, that protect the health of the Bay.

Recognize that continuous development at present rates means that the increase of non-point source pollution will swamp point-source improvements.

Develop public awareness of non-point pollution sources and impact.

Limit excessive development of barrier beaches and salt water fringe areas; address the eventual impacts of the projected sea-level rise.

Develop and implement a zoning enabling act that permits local jurisdictions to control development more effectively.

Encourage the development of water-dependent uses of the shoreline.

Preserve and develop public access that reflects demand and allows the general public to have meaningful access to and onto the Bay.

Remember that the Bay is an important economic asset and that the creation and maintenance of business uses of the Bay must be considered. Any effort to rehabilitate the Bay must also address the problem of cost.

Group D (General Public)

Group D met on January 27, 1987 and after spirited discussion identified a variety of goals. The following list is divided into two broad categories that reflect the major concerns and goals identified by the participants. Within each category, short-term goals are listed first, followed by longer-term goals. The listing does not reflect the priorities of the participants.

Access

Identify, establish and protect the public's "property rights" in the Bay.

Inventory uses along the shoreline, especially of the upper Bay.

Identify strategic, important points of public access. Protect and expand access for inexpensive and passive recreation, such as viewing, walking, bird watching, etc.

Require new development to provide for public access to the Bay and protect existing rights of way.

Provide baseline information about conditions in the Bay to provide a standard of measurement for the future.

Provide information on swimming conditions in various parts of the Bay. Create a chart of swimmable or non-swimmable areas provided weekly on television weather programs (the Bouchard factor). Define, if applicable, a swimming "line" comparable to the shellfishing line.

Improve shoreline of upper Bay by removing old piers, unused energy storage facilities, etc. Create open waterfront spaces.

Acquire open waterfront space to enhance public access to the shore.

Develop "parkway" system that provides the public with scenic views of the Bay and marks historical, cultural and natural sights.

General

Look at coastal regulatory efforts in other states with successful, long-term programs to develop better, tighter laws and regulations.

Strengthen CRMC to make it more effective; finance DEM to enforce regulations.

Develop a Bay Watch 1-800-number to report violations.

Curtail pirate dumping of toxic and other hazardous wastes.

Promote effective litter control measures both on and around the Bay.

Determine extent of toxic materials in sediments.

Develop more information on the extent of non-point source pollution.

Assess accumulative impact of development on the Bay.

Develop industrial uses for recycled waste-water treatment plants' effluent.

Develop alternative means for dealing with polluted sediment.

Promote water conservation.

Group E (Industrial)

Group E met on January 29, 1987, and discussed a variety of goals. The following list is divided into three broad categories that reflect the major concerns and goals identified by the participants. Within each category, short-term goals are listed first, followed by longer-term goals. The list does not reflect the participants' priorities.

Industrial Problems

Identify industrial point sources of pollution among non-electroplating industries.

Reduce industrial toxics in Bay through uniform enforcement of existing regulations against all businesses, small and large. Get beyond "enforcement by example" approach.

Develop positive incentives for meeting industrial discharge limits by, for example, providing sewer use fee credits to industries meeting or exceeding limits.

Develop information about the extent and impact of toxics in the sediment.

Find out more about non-point sources of pollution.

Weigh cumulative impact of pollution, especially toxics.

Identify segments of the Bay that cannot be saved or rehabilitated, if there are such portions.

Develop marine-related industry, like shipyards, in appropriate areas.

Carry out overall planning for uses of the Bay; plan more logically uses of different portions of the Bay.

Regulatory Considerations

Reduce the length of time it requires CRMC to respond to permit requests.

Have regulatory agencies handle industrial project proposals on an expedited basis, giving them priority, for example, over residential projects.

Set priorities on the importance and enforcement of different environmental regulations.

General

Increase the volume of freight in Providence and Quonset ports.

Conduct an inventory of existing waterfront access.

Require development projects to plan for public access.

Guarantee future access to beaches.

Increase public awareness of the Bay and its benefits and fragility.

Group F (Scientific & Academic)

Group F met on February 2, 1987 and discussed a variety of goals. The following list divides those goals into three broad categories that reflect the major concerns and observations of the participants. The list does not reflect the participants' priorities.

Understanding of the Bay

There needs to be much greater understanding of the biological, chemical and physical nature of the Bay, focusing on:

- A holistic view of the Bay as an ecosystem greater than the sum of its parts or segments
- The dynamic, synergistic nature of the constantly changing Bay
- The establishment of a system of gradients that reflect the Bay's complexity, diversity and dynamism
- Non-point sources of pollution
- An assessment of damages related to anticipated and/or desired uses
- Linkages and interactions among various components of change
- The impact of natural and normal changes (seasonal, winds, light, temperature) versus man-induced changes

Our understanding of the biological status of the Bay must include the development of information and measurements that will indicate at some future date whether our investments have affected the biology of the Bay. We need baseline data against which to measure effectively the future status of the Bay.

Prediction

There is a need to be able to predict what impact inputs and changes will have on the Bay. We need to develop ways of predicting when non-linear or dramatic changes are likely to occur.

Develop the kinds of measurement that will let us know when things have gone badly awry; identify two or three key species and keep a close watch on them; identify key transition points between good and bad and use them to trigger assessments; develop ways to predict and monitor eutrophication. Develop models that produce what regulators can use and provide long-term documentation of biological effects.

Integration

Maximize research activities and benefits by integrating communication among the scientific disciplines and within the research community about research goals and efforts.

Establish a Narragansett Bay Institute to unify and fund future research efforts.

Promote greater dialogue between the scientific and research community and policy makers.

Establish importance of, and respect for, scientific research in the general community to reduce interference with measurement and other study efforts.

APPENDIX C

Narragansett Bay Project
Goals Questionnaire
and Results

Narragansett Bay Project
Goals Questionnaire*

In order to refine further the goals that emerged from the workshop, we ask you to complete the following questionnaire and return it in the enclosed self-addressed envelope. Many Thanks.

1. Name: (optional) _____

2. Group (check one):
Commercial _____
Recreational/environmental _____
Regulatory Agencies _____
General Public _____
Industry _____
Scientific and Academic _____

3. Identified research needs relating to measurement and evaluation included:

- 1 A. Measure the magnitude of various pollution sources.
- 2 B. Describe baseline conditions.
- 3 C. Develop capability to predict changes due to human activities.
- 6 D. Develop techniques to enhance growth of commercial fisheries.
- 4 E. Develop long-term monitoring strategy.
- 5 F. Evaluate risk to human health from consumption of contaminated fish and shellfish.

Rank these needs according to priority (one being the highest and six, the lowest; do not duplicate numbers).

* 37 participants (61%) responded to the questionnaire. The indicated rankings were computed by adding all of the rankings for a particular response and dividing the sum by the number of responding participants. Reported numbers do not always add up to 37 because some participants did not respond to some questions or responded with an explanation rather than accepting one of the indicated responses.

4. The goals address the impact of pollution on different uses of the Bay, including (A) shell-fishing, (B) fin-fishing and (C) swimming. If resources were available to assess the impact of pollution on only one (1) of these uses, on which use would you concentrate? A

If resources were available to assess the impact of pollution on two (2) of these uses, on which uses would you concentrate? A B

5. If providing a safe, environmentally acceptable disposal site for clean dredge materials in the Bay were to cause temporary (say 3 to 6 months) disruption of shell-fishing and fin-fishing in an area of the Bay, would you still be in favor of dredging? Yes X No (27-7)

6. Among the following potential uses of any specific patch of Narragansett Bay water, rank in descending order your preferred or favored uses (one being the most preferred):

- 2 Swimming
- 5 Aquaculture
- 1 Shell-fishing
- 4 Boating
- 3 Fin-fishing

7. Among the following potential uses of any specific stretch of Narragansett Bay shoreline, rank in descending order your preferred or favored uses (one being the most preferred):

- 1 Recreational development (e.g., a marina)
- 2 Residential development
- 3 Water-dependent industrial/commercial development
- 4 Non-water-dependent industrial/commercial development

8. What percentage of presently undeveloped shoreline of the Bay would you prefer to see developed between now and the year 2000? 12 % (0-50%)

9. Should all shoreline residential development be conditioned on providing for public shoreline access? Yes X No _____ (28-8)

10. Would you approve the siting in Rhode Island of a general industry that uses toxic materials or substances if it met all applicable pretreatment requirements? Yes X No _____ (28-8)

11. The goals identified in the workshops suggest several broad approaches to the problems of Narragansett Bay, including:

- A. Gather sufficient baseline data to be able to measure future progress or retrogression in regard to water quality.
- B. Provide for clear and consistent enforcement of existing laws and regulations.
- C. Educate the public about the benefits of and dangers to the Bay.
- D. Develop better tools for monitoring pollution and predicting an upset.
- E. Develop a comprehensive plan for Bay management.

Based on your estimation of the effectiveness of these five approaches, rank them in descending order of preference (one being the most effective):

- 1. B
- 2. A
- 3. E
- 4. D
- 5. C

12. Assuming that sufficient resources are available to the Narragansett Bay Project to address water quality issues, rank in descending order of importance the goals the Project ought next to address (one being the most important):

- 2 Competing uses of the water
- 3 Access to the Bay
- 1 Protection of shoreline features
(marshes, wetlands)

APPENDIX D

Narragansett Bay Project

Goals Mediation

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