

Chapter 1

Introduction

The Clean Water Act as amended by the Water Quality Act of 1987 establishes the National Estuary Program (NEP) to promote long term planning and management in nationally significant estuaries threatened by pollution, development, or overuse. Section 320 of the Clean Water Act describes the establishment of a management conference in each estuary to develop a Comprehensive Conservation and Management Plan (CCMP). It also establishes requirements to monitor the effectiveness of actions taken pursuant to the plan.

Galveston Bay National Estuary Program

The Galveston Bay National Estuary Program (GBNEP) was established under the authority of the Water Quality Act of 1987 to develop a CCMP for Galveston Bay. In 1990 work commenced to (1) identify specific problems facing the Bay, (2) compile bay-wide data and information to describe the status, trends, and probable causes related to the identified problems, and (3) create the CCMP document to enhance governance of the Bay at the ecosystem level. GBNEP is accomplishing this work through cooperative agreement between the US Environmental Protection Agency (USEPA) Region 6 and the State of Texas administered by the Texas Natural Resource Conservation Commission (TNRCC). The structure of GBNEP reflects a strong commitment to consensus-building among all Galveston Bay user groups, government agencies, and the public. This regional effort reflects thousand of hours of involvement by individuals who use, enjoy, or help govern this vital coastal resource.

Commitment to Monitoring

One of the early commitments of the Galveston Bay National Estuary Program was to the development of a sound regional monitoring program. The need for such a program was formalized at the Galveston Bay National Estuary Program- Regional Monitoring Conference held in Galveston, Texas on July 8-9, 1992. The conference was widely attended by technical experts and managers of local, state and federal programs administering monitoring activities in Galveston Bay. From this conference come the conceptual framework for the development of a regional

monitoring program. Recommendations from this conference included the following points (Tetra Tech, 1992).

- A regional monitoring program is needed to improve our ability to effectively manage resources in the estuary,
- Establishment and management of a technically sound regional monitoring program is feasible,
- The details of the monitoring program should be designed by technical experts working with managers and decision makers.

With this guidance, the *Galveston Bay Regional Monitoring Strategy* (Tetra Tech, 1994) document was created. This document centers around describing the Task Force findings for five central management topics. These topics were identified by the GBNEP program office and are further described in the Galveston Bay Comprehensive Conservation and Management Plan (CCMP). They are:

- Water and sediment quality
- Species population protection
- Habitat protection
- Freshwater inflow
- Public health protection

A Task Force was established for each of the five management topics with meetings being held over a period of months. Each task force was charged with developing action plan items to address perceived threats and concerns. Once these action plans were incorporated into the CCMP monitoring objectives and information needs were developed. A detailed account of this process and the results of the Task Force findings are found in the *Galveston Bay Regional Monitoring Strategy* (Tetra Tech, 1994). This document served as a guidance document for development of the monitoring program but did not fulfill the requirements for a monitoring plan as defined in the CCMP approval guidance (USEPA, 1992a).

Monitoring Guidance

The primary objectives and requirements of the implementation plan are established in the *National Estuary Program Guidance: Comprehensive Conservation and Management Plans: Content and Approval Requirements* document. The goals for the monitoring plan are:

- To measure the effectiveness of the management plan action and objectives
- To provide essential information that can be used to redirect and focus the CCMP during implementation.

The specific requirements of the plan are:

- To define program objectives and performance criteria (i.e. parameters to be monitored,
- To identify testable hypotheses,

- To specify monitoring variables, including sampling locations, monitoring frequency, field and laboratory methods and QA/QC procedures,
- To specify data management system and statistical tests to analyze the monitoring data,
- To describe the expected performance of the initial sampling design, and
- To provide a timetable for analyzing data and assessing program performance.

To accomplish this task the Monitoring Work Group was created to develop a detailed implementation plan that builds on the task force recommendations and which meets the requirements for CCMP approval. This work group was constructed as an interagency assemblage of monitoring and monitoring technical experts. The following goal statement was developed to give guidance and direction to the work group.

The Regional Monitoring Program will be developed as a statistically sound, holistic monitoring effort designed to provide environmental data of known quality and confidence. It will be responsive to CCMP management goals and objectives, but will also have a larger goal of providing knowledge of bay-wide ecosystems, their variability, and societal impacts both environmental and ecological. Understanding that no agency's mandate is broad enough for this undertaking, the Regional Monitoring Program is seeking to promote a cooperative effort by all agencies, organizations, and other stakeholders who participate in bay monitoring activities. The Galveston Bay Regional Monitoring Program attempts to integrate and expand the disparate monitoring efforts currently active on the Bay into a comprehensive and unified monitoring plan. The regional monitoring program will integrate current monitoring efforts to the maximum extent possible, while acceding to the independent objectives of the groups involved. The plan will be developed with full participation of all interested agencies in order to encourage cooperation and communication and to maximize the potential for successful implementation.

An attempt is made to provide detailed rationale, both technical and practical, for the selection of monitoring indicators. Much of the information presented is documented more completely in the *Galveston Bay Regional Monitoring Strategy* (Tetra Tech, 1994a). The second of two Tetra Tech documents, *Protocols for Sample Collection and Analysis: Galveston Bay Regional Monitoring Program* (Tetra Tech, 1994b), included as Appendix A of this document, is a monitoring protocol standardization document. Information from both documents, has been utilized in creating the final *Galveston Bay Regional Monitoring Program* document.

Also critical in the creation of this document were the members of the GBNEP Regional Monitoring Work Group. Through their combined efforts this monitoring plan has evolved from a group of broad suggestions and guidelines to a functional and implementable plan. Special thanks are extended to Work Group members George Guillen (Texas Natural Resources Conservation Commission), Kirk Wiles (Texas Department of Health), Lance Robinson (Texas Parks and Wildlife

Department), Dr. Norris Tyer, Jr. (Harris County Pollution Control Department), Gary Fogarty (Galveston County Health District), Theo Glanton (City of Houston-Department of Public Works and Engineering), Terry Fisher (City of Houston-Environmental Health Division), Frederick Werner (U.S. Fish and Wildlife Service), Dr. Fred Liscum (U.S. Geological Survey), Carl Masterson (Houston-Galveston Area Council), and the many others who participated in the many focus groups.