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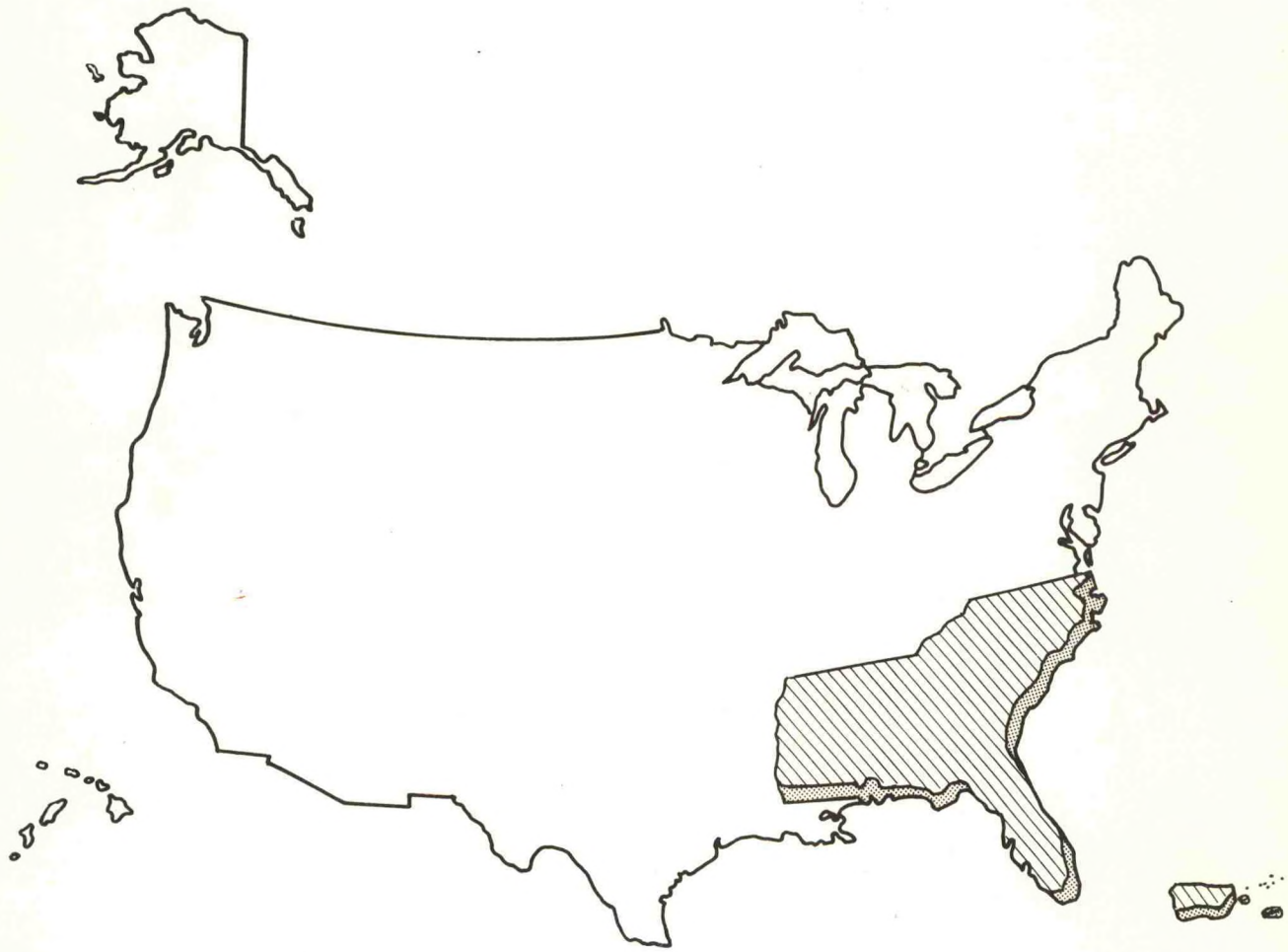

June 1981

Report of Southeastern Regional Workshop on Ocean Pollution Monitoring

Atlanta, GA, January 27-28, 1981

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June 1981

UNITED STATES DEPARTMENT OF COMMERCE

Malcolm Baldrige, Secretary

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

James P. Walsh, Acting Administrator

Office of Marine Pollution Assessment

R.L. Swanson, Director

ACKNOWLEDGEMENTS

To all participants, presenters, and moderators of this workshop, NOAA/OMPA and EPA Region IV extend a sincere "thank you" for your assistance in providing up-dated information on marine pollution monitoring for the next Federal Plan on Ocean Pollution Research, Development and Monitoring.

EXECUTIVE SUMMARY

This report summarizes the results of a joint National Oceanic and Atmospheric Administration (NOAA) and Environmental Protection Agency (EPA) workshop on the status and requirements of marine pollution monitoring programs along the South Atlantic and Eastern Gulf of Mexico coasts. The meeting was hosted by the NOAA Office of Marine Pollution Assessment and the EPA Region IV Surveillance and Analysis Division on January 27-28, 1981, in Atlanta, Georgia.

The purpose of the workshop and this report is to provide up-dated information on marine pollution monitoring for the next Federal Plan on Ocean Pollution Research, Development and Monitoring, mandated by Public Law 95-273, and to assist the host agencies in developing their long-range plans for marine pollution monitoring. The Atlanta workshop was one of six such meetings held throughout the country during the fall and winter of 1980-1981.

Chapter I of this report contains a summary of the background information presented at the workshop by NOAA representatives. It contains a brief discussion of the First Federal Plan, a summary of the Report of the South Atlantic and Gulf Region Conference on Marine Pollution Problems (held in New Orleans in June, 1980), and definitions and recommendations from the Interagency Monitoring Subcommittee Report. The chapter also outlines the objectives and approach of the marine pollution monitoring workshop.

Chapter II contains a summary of the key findings and recommendations of the monitoring workshop. These include the need to develop: 1) Better assessments of existing monitoring programs and their data; 2) More reliable, cost-effective sampling and analysis technology; 3) Additional baseline data on most of the estuaries and wetlands; 4) A regional data and information dissemination and referral center; and 5) A mechanism for standardization, intercalibration, and quality control of data collection and analysis methods.

Chapter III contains summaries of the presentations by representatives of Federal, state, and local/municipal agencies. This chapter highlights examples of monitoring programs conducted by each of these groups, and briefly presents the major concerns of each group.

Chapter IV summarizes a presentation given at the workshop on an approach to meeting national ocean pollution monitoring program requirements. The comments and responses made by the participants relative to the proposed approach are also summarized.

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I

INTRODUCTION

The National Oceanic and Atmospheric Administration's (NOAA's) Office of Marine Pollution Assessment (OMPA) and the Environmental Protection Agency (EPA) Region IV convened a workshop on marine pollution monitoring in Atlanta, Georgia, on January 27-28, 1981. The purpose of this workshop was to obtain an overview of regional marine pollution monitoring requirements and to obtain an assessment of monitoring activities within Region IV. Statements on regional and detailed monitoring program needs, as well as a description of regional ecosystem monitoring needs and strategies, were reviewed. Most participants were monitoring data suppliers and information users who are responsible for policy development, implementation, and/or management decisions within their respective agencies or activities.

The inventory of marine pollution monitoring activities, the assessment of the adequacy and utilization, and the organizational, fiscal, and technical problems associated with them are national concerns. The Atlanta workshop was one of six sponsored by NOAA/OMPA and the various EPA Regions to obtain a nation-wide perspective on these issues. These monitoring workshops were held subsequent to the completion of a series of NOAA/National Marine Pollution Program Office (NMPPO) Planning Workshops, which had broader objectives aimed at the determination of regional needs and priorities in ocean pollution research, development, and monitoring, basically from a scientific point of view.

Background - The Federal Plan

In May, 1978, Congress enacted and the President signed Public Law 95-273 (see Appendix A) which became known as the National Ocean Pollution Planning Act of 1978. Congress felt that numerous departments and agencies of the Federal government, who were responsible for research, development, and monitoring on ocean pollution to provide needed understanding for the wise use and development of the coastal resources, were doing their work independently of each other, thus resulting in duplicative efforts.

Congress thus concluded that a need existed for better planning and coordination of the Federal efforts to make more effective use of the Federal resources, including funds, personnel, vessels, facilities, and equipment.

The approach to implementing the legislation was to involve all concerned Federal agencies in the preparation of a comprehensive 5-year Federal Plan for ocean pollution research, development and monitoring (R,D&M). For this purpose an interagency Committee on Ocean Pollution Research, Development, and Monitoring (COPRDM) was chartered. NOAA, as the designated lead Federal agency, established the National Marine Pollution Program Office (NMPPO) to lead the development of the Plan, facilitate the implementation of the Plan, and to perform staff functions for COPRDM. In addition, the Office of Marine Pollution Assessment (OMPA) was created to facilitate planning and coordination within NOAA.

One of the four working subcommittees formed by COPRDM was the Subcommittee for Monitoring. This subcommittee was given responsibility for identifying all relevant Federal programs in the area of ocean pollution monitoring, for analyzing them in terms of what extent they meet national needs and priorities, and for recommending how to improve the Federal R,D&M programs. The recommendations made by the Monitoring Subcommittee are provided in Appendix B.

Marine Pollution Needs and Problems: Summary of the Summer, 1980, South Atlantic and Gulf Region Conference [1*]

The NOAA/National Marine Pollution Program Office (NMPPO) held five regional meetings during the Summer of 1980 in order to develop regional needs and priorities for a Second Federal Plan on ocean pollution R,D&M. One of these meetings, the South Atlantic and Gulf Region Conference on Marine Pollution Problems, was held in New Orleans on June 10-12, 1980. This three-day meeting was hosted by the Louisiana State University Sea Grant program, working with NOAA staff. Fifty-three pollution and marine resource specialists representing academia, regulatory agencies, industries, and environmental organizaions attended this conference. The areal scope of the conference included the South Atlantic coastal area (from North Carolina to Southern Florida), the entire Gulf of Mexico (from Key West, Florida to Brownsville, Texas), Puerto Rico, and the Virgin Islands.

*Numbered references provided in Appendix J.

The objectives of this regional conference were to characterize the nature and magnitude of regional marine pollution problems, to identify the information required to manage these problems, and to assign priorities to the information needs. Additional details on the results of this conference are provided in Appendix C. The reports from all five of the regional conferences are being utilized in shaping the goals and priorities of the Second Federal Plan, currently being developed under the guidance of NOAA/NMPPO in compliance with P.L. 95-273 requirements.

Objectives and Approach of Marine Pollution Monitoring Workshop

The steering committee for the Summer, 1980, regional conferences recommended that the issue of monitoring should be discussed at separate meetings. Thus, NOAA/OMPA, together with regional EPA Surveillance and Analysis Offices, held six regional workshops which focused on the needs, problems, and priorities of ocean pollution monitoring. The fifth in the series of monitoring workshops was held in Atlanta, Georgia on January 27-28, 1981. It brought together an expert group from EPA Region IV who were involved with marine pollution monitoring activities. Representatives from Federal agencies, state and local/municipal governments, industry, and public interest groups were invited to participate in the workshop. Names and addresses of participants are provided in Appendix D and a list of all invitees is provided in Appendix E.

The stated goals of the workshop were to:

1) Determine the extent to which existing monitoring programs address local and regional ocean pollution problems and informational requirements; and

2) Assess the requirements for a coordinated, regional ocean pollution monitoring program, and discuss options.

Detailed workshop objectives were as follows:

1) Establish an inventory and overview of the existing marine pollution monitoring activities in Region IV. This objective followed the recommendations of the COPRDM Monitoring Subcommittee. Since all organizations involved with ocean pollution monitoring could not be represented at the workshop, the participants were asked to provide NOAA with leads to other organizations and agencies that should be contacted.

2) Solicit participants' views on how to improve the utility of monitoring data and information in their particular area of interest. Representatives from municipalities, industries, and state and Federal agencies made short formal presentations to highlight their programs and to discuss major monitoring concerns. Their presentations set the stage for subsequent discussions among all participants.

3) Obtain participants' assessment of the requirements and priorities of monitoring-related activities as presented at this and other meetings. The Interagency Monitoring Subcommittee recommendations and a summary of the NMPPO South Atlantic/Gulf Region Conference recommendations were presented to the participants for their assessment. The participants' responses are summarized in Chapter II of this report. However, they did not directly address the issue of priorities.

4) Define the needs and determine the degree of concern for a region-wide ecosystem health monitoring program, including strategies and the roles of the various concerned organizations. In addressing this objective, a regional ecosystem monitoring approach (see Chapter IV of this report) was presented to the participants for comments. Subsequent discussions related the various programs and concerns in Region IV to the proposed regional program.

5) Determine requirements for improved technology. Participants were asked to identify their needs, if any, for the development of new or improved technology in the area of ocean pollution monitoring.

The workshop agenda is provided in Appendix F. In addition to providing a schedule of the program, the agenda also highlighted some of the questions to be addressed by participants, but in no way limited them to specific issues. Participants were informed that the information provided by them would be published as the authoritative statement on marine pollution monitoring from their region, and that the results would be combined with other regional reports into one report representing a national statement on marine pollution monitoring. This national report will serve as a back-up document for the next Federal Plan for Ocean Pollution Research, Development, and Monitoring.

Definition of Terms

In order to provide a reference level to the participants of the monitoring workshop for such terms as monitoring and research, the definitions from the Interagency Monitoring Subcommittee Report were used. These definitions are presented and discussed in Appendix G of this report.

II

CONSOLIDATED RESULTS OF MONITORING WORKSHOP

The findings and needs presented in this chapter reflect the speakers' presentations and the informal discussions among the audience, both immediately following the presentations as well as in follow-on panel sessions. Emphasis has been placed on the findings and needs that are representative of the workshop as a whole, rather than providing here an all inclusive list. The consolidated results include the discussions on the examples of monitoring programs presented by various Federal, state, and local agencies and industry, as well as on the approaches to a national ocean pollution monitoring program. Summaries of the individual presentations and discussions for both categories are presented in Chapters III and IV, respectively.

Uses of Monitoring Data

Most existing monitoring programs assure that mandated effluent or water quality criteria are met, and that the public is not exposed to health hazards through either contact with the water or eating seafood products. Currently, after the primary functions of the monitoring programs are served, their data are used by the states in preparation of the biennial "Water Quality Report to Congress." Those data which are put into STORET are used by the EPA Region IV, Surveillance and Analysis Division for water profiles and long term trend analysis, along with water quality assessments. A mechanism is needed to continually evaluate monitoring programs so that they meet changing management needs and that their data are useful for broader environmental assessments.

Need for Additional Data

Additional new local or regional monitoring programs were not recommended. As a first priority, an adequate inventory of the existing activities must be made, including the identification of agency responsibilities. However, wetlands were identified as critical habitats which are not being adequately monitored (see discussion below).

The establishment of a regional planning and coordination mechanism, possibly in connection with the regional data and information function (see below), was discussed and generally supported, provided the regional agencies retain a lead role.

Data and Information Systems

Concern was expressed about the adequacy of the existing data and information dissemination systems. A high priority was placed on the establishment of a regional data and information storage and referral office that would update and verify existing systems.

It was recognized that a coastal data and information system would be desirable, but would be extremely complex, costly, and difficult to maintain. However, off-shore oil production virtually mandates some sort of system containing baseline estuary data.

Concern for Wetlands

Agencies emphasized that the outstanding regional concern is on the protection of fisheries. In this regard, the need was advocated for additional baseline data on most of the estuaries and wetlands. Since wetlands are one of the critical habitats, it was recommended that more research and monitoring should be conducted on them.

Standardization Requirements

There is a need to establish a mechanism whereby concerned agencies can agree on standards of data collection and analysis, including intercalibration and intercomparability of data sets for quality assurance. While the adoption of a set of documented guidelines was advocated, several agencies expressed caution about standardization and wanted to assure adequate flexibility in case they could not afford to adopt the standards.

Need for Improved Technology

There was general disinterest in the development of sophisticated new technology to replace current sampling and analysis methods. Automation, telemetry, and remote sensing technology were not perceived as cost effective for most of the local programs. However, the improvement of the reliability of existing sampling and analysis methods received strong support.

Training Need

A strong need was expressed for training programs for personnel involved in field measurement and sampling. Frequently these activities are conducted by personnel with inadequate technical skills.

Research Need

A research need was identified relative to better methodologies and data assessments for biological monitoring. Biological parameters are thought to give a better indication of the water quality than do chemical parameters.

III

EXAMPLES OF MONITORING PROGRAMS

As discussed in the Introduction, this workshop brought together representatives from Federal, state, and local government agencies, as well as from industry and public interest groups (see Table 1), to determine the extent to which existing monitoring programs were addressing local and regional ocean pollution problems and informational requirements in Region IV. To achieve this objective, several representatives from the different agencies highlighted their programs and introduced their needs and concerns. These presentations set the stage for additional discussions among all participants.

The discussion of monitoring programs was divided into three sessions: local/municipal agencies and industry programs, state programs, and Federal programs. (See Agenda in Appendix F.) Industry presentations were originally scheduled to have a separate session, but because most of the invited industry representatives withdrew or declined, industry representation was much less than hoped for. The speakers in each session were asked to address the following questions as applicable to their agency, but were in no way limited to these issues.

1) Are you a collector of monitoring data? A user? Neither?

2) What marine pollution monitoring activities do you conduct and what are their rationale (environmental problems, geographical area coverage, number of stations, sampling frequency (statistical design), types of data, types of data analyses), their ultimate use, availability, and disposition of data and information?

3) Who are the users of your monitoring information, and how do they use the data?

4) How effectively are your monitoring data and information used in decision making (time delay from measurements to action, contributing factors in addition to monitoring data)?

5) What are the resource requirements for your present monitoring programs? What are the sources of your major funds?

Table 1. Agencies and Organizations Represented at Workshop

Federal Agencies

Coast Guard
Corps of Engineers
Environmental Protection Agency
Fish and Wildlife Service
Geological Survey
National Oceanic and Atmospheric Administration
Naval Facilities Engineering Command

State Agencies

Alabama Coastal Area Board
Alabama Geological Survey
Florida Department of Natural Resources
Georgia Department of Natural Resources
North Carolina Department of Human Resources
South Carolina Coastal Council
South Carolina Department of Health and Environmental Control
South Carolina Governor's Office - Coastal Energy Impact Program
South Carolina Wildlife and Marine Resources Department

Universities

Louisiana State University - Center for Wetland Resources
Mississippi - Alabama Sea Grant Consortium
Skidaway Institute of Oceanography
University of Alabama - Marine Environmental Sciences Consortium
University of South Carolina - Baruch Institute

Industries

Continental Shelf Associates, Inc.
International Paper Co.
Jones, Edmunds, & Associates
Science Applications, Inc.
SEAMOcean
Southwest Research Institute

Local/Municipal Agencies

Dade County Environmental Resources Management Department
Hillsborough County Environmental Protection Commission
Palm Beach County Health Department

Public Interest and Other Organizations

The Georgia Conservancy

6) What new monitoring activities (modification of programs, new programs, program coordination, synthesis and information dissemination, change of pollutant emphasis, etc.) do you feel are necessary to address local and regional marine pollution problems, needs, and priorities, including those identified at the recent NOAA/NMPPO workshop?

7) What are your needs in terms of improved technology?

Following the three sessions on monitoring programs, these questions were further addressed in a panel-led discussion session.

Local/Municipal and Industry Programs

Hillsborough County Environmental Protection Commission. The monitoring efforts in Tampa Bay, Florida, and the adjacent estuarine system were summarized. This Commission handles all monitoring in compliance with Florida laws and EPA mandates. The monitoring stations and data have expanded since 1972 to 54 stations. There is acute awareness for quality assurance because their data are used for enforcement and litigation. An annual data summary, as well as raw data, are available upon request.

Funding is received from the state and from EPA. In general, air quality monitoring receives better support than marine monitoring. In 1980, a total of $1,176,000 was budgeted, of which $674,000 supported air pollution monitoring and $502,000 was dedicated to other than air pollution (i.e., marine, energy, noise, etc.). Their laboratory has a staff of 55 persons with $400,000 dedicated to salaries and $30,000 to equipment. They use state-of-the-art, simple equipment and find little need for high technology, such as remote sensing. A need was expressed for the expansion of biological monitoring procedures, more work with chlorophyll data, and microscopic observations of plankton (red-tide bias).

Palm Beach County Health Department. The water quality sampling program related to marine and estuarine waters was discussed. Samples have been collected on a regular uninterrupted schedule for the last 30 years (monthly until 1978, quarterly since then). A sampling network runs the length of the county along the coast and includes all public inlets and beaches. The network design was dictated by an interest in monitoring the bathing areas in the county and determining the effects, if any, of runoff and wastewater treatment as practiced throughout the county. EPA guidelines for quality assurance are followed throughout the sampling, sample handling, and analysis procedures.

The sampling program has provided this agency with background data to draw from, for both enforcement cases and the identification of hot spots resulting from point source discharge. On one occasion, routine bacteriological monitoring showed a hot spot developing and subsequent inspection revealed an illegal raw sewage discharge. The adjacent beach was quarantined until the discharge was stopped.

A need was expressed for a continuing training program for personnel involved in field measurement and sample taking. In addition, attention must be paid to the establishment of better communications with other agencies and industries that are conducting water monitoring programs in the same or adjacent areas. The continual expansion and upgrading of quality assurance programs was advocated. A need was also expressed for all aspects of the programs to be covered by standard operating procedures, with adherence to all these procedures documented.

Dade County Environmental Resources Management Department. Beaches are of major interest in Dade County since 20 percent of the Florida population is within a one-hour drive from these recreational areas. Marine pollution data are collected on a monthly basis using EPA monitoring criteria in recreational areas and using state and local criteria at river mouths and local discharge points.

Several research needs were indicated, such as determining the cause of fin rot and other fish diseases and determining the long-term effects of siltation. Slides were shown comparing healthy coral with coral on which sponge populations had been stressed, coral algae had been buried by siltation, and invertebrate populations had been reduced. The photos had been taken by scuba divers, and when asked about a remote-controlled submersible vehicle to take bottom photos, the reply was that it would be too expensive.

Continental Shelf Associates, Inc. The speaker addressed several marine environmental monitoring studies conducted primarily in support of OCS oil and gas exploration and development. These were Federal OCS pre-lease environmental studies and industrial development permit compliance monitoring studies. Two recently completed projects in the Gulf of Mexico and South Atlantic, funded by BLM, involved the delineation of sensitive biological or "live-bottom" areas within proposed OCS lease areas. When live-bottom sensitive areas are verified within a one mile radius of the proposed drilling

site, lease stipulations require the leasee to shunt drill cuttings to the bottom, transport the cuttings from the site, or provide a monitoring program for the sensitive area.

Summary of Local and Industry Session. Most local monitoring programs are concerned with the protection of public health and the environment and with the establishment of a water quality baseline for trend analysis. The types of monitoring programs discussed by the local/municipal representatives included bacterial monitoring of public beaches, monitoring of hazardous materials, and studies of the effects of dredge spoils on coral communities. The participants emphasized a need for standardization of analysis procedures and quality assurance improvements. In addition, they stressed the importance of better communication with other agencies and industries who are conducting monitoring programs in similar areas.

Several of the participants discussed research needs. These included: 1) A better understanding of biological monitoring and the use of indicator organisms; 2) Determining the cause of fin rot and other fish diseases; 3) Determining the long-term effects of sedimentation on coral reefs; and 4) A better understanding of the Gulf transport mechanism and current regime, especially in relation to potential oil spills.

State Agency Programs

Alabama Coastal Area Board. Programs under the Board's jurisdiction include the surveillance of 50 miles of beach, 200,000 acres of wetlands, and 200 acres of clambeds. Fishing is a major marine industry in this area, and the port of Mobile is the ninth largest in the country. Concern was expressed for the growth in waste discharges and the effects of an expanding oil/gas offshore industry. It was indicated that more data is required to develop trends and that data quality assurance improvements are also desirable.

South Carolina Department of Health and Environmental Control. At present, there are 173 primary monitoring stations in South Carolina (including 33 in coastal areas and 16 dedicated to sediment and heavy metal measurement and analysis). Additionally, there are 112 secondary stations in recreational waters. The funding level is about $480,000/year (33% Federal and 67% state). About 10% of the expenditures occur in coastal waters. Data is mainly used

for compliance and enforcement activities in both point and nonpoint pollution sources. Quality assurance is considered a very important part of the program with the level of quality always documented in laboratory and field data.

The needs identified included: 1) Additional baseline data on small tidal creeks; 2) Additional baseline data on heavy metals and residues in sediments and tissues: 3) More emphasis on biological monitoring; and 4) Long-term trend analysis with flexibility to concentrate on specific areas for 3-4 years.

North Carolina Department of Health and Human Services. It was indicated that 328,000 acres of the North Carolina marine environment are closed to shellfish harvesting along a 220 mile shoreline. A total coliform standard (FDA) is used in monitoring, with fecal coliform measurements used only in a supportive capacity. (Fecal coliform measurements are not accepted as an alternative to a total coliform standard.) Salinity and temperature measurements are also monitored. The time delay between data collection, analysis, and transfer to a user action is approximately one week.

It was stated that more work is needed in the area of virus research. Illness from oyster consumption in North Carolina is extensive despite the fact that oyster beds meet all inspection standards. The increasing pollution due to lack of housing development control, run-off from agricultural/industrial drainage, peat mining in coastal areas, and sanitary discharges from numerous yachts and boats, were addressed as deleterious contributory factors. On a positive note, it was indicated that sewage treatment plants are being upgraded.

Florida Department of Natural Resources, Marine Research Laboratories. The speaker discussed several of their programs. He stated that Florida waters show a higher than normal level of radionuclides, and public pressure for increased research and monitoring is evident. He also indicated a concern for the relation of human pathogens to coliform counts in water.

It was reported that red-tide investigations have been conducted using satellite imagery. Better results have been obtained on the Gulf coast than on the Atlantic coast. Research on oil pollution in the Gulf of Mexico is done by contract with Geomarine Texas and the Florida Institute of Oceanography.

Summary of State Session. State agencies are dictated by state statutes to establish monitoring programs for public health and environmental protection and to establish water quality trends. The needs and concerns expressed by the state agency representatives were almost identical to those of the local agencies. They stressed the need for improvements in quality assurance and standardization of analysis and data handling procedures. A major concern was the lack of baseline data for estuaries and wetlands.

In terms of research needs, several state agencies emphasized the need for more biological monitoring. Others indicated a need for more virus research, especially as related to shellfish, and a better understanding of the relation between human pathogens to coliform counts in water.

Federal Agency Programs

Environmental Protection Agency (EPA). EPA, Region IV, is both a collector and user of environmental monitoring data. Most of the data collection is funded through the state pollution control agencies as a joint state/Federal monitoring effort based on Section 106 of the Clean Water Act. For Region IV, the total Federal cost was $9,503,000, matched by a combined state contribution of $16,595,000, for a total monitoring program of over $26 million.

The program, called the Basic Water Monitoring Program, is geographically oriented to the waters of the eight Southeastern states in Region IV and is designed to meet both state and national water pollution control program needs. The fixed station network consists of 208 core stations, sampled monthly, supplemented by about 1300 additional state stations sampled monthly, quarterly, semiannually, or annually. These are trend stations for background information. Except for the biological data, these data are all stored in their national STORET computerized Water Quality File.

It was stated that some data, usually special study data, are used directly for management decisions (e.g., enforcement cases, recommendations for closure of fishing areas) while others are only used to answer inquiries about background levels and for preparation of reports. These data become only one of the many pieces of information on which management decisions are based. Fisheries protection is of the highest priority and the most useful

data are those designed to answer specific questions, i.e., what is the cause of a decline of striped bass fisheries or snook fisheries? Background data are also useful if they are reliable. These are the purposes of the STORET system. It was emphasized that the greatest need for improvement is to generate a more complete, timely, and available data base, including biological as well as water quality data.

U.S. Army Corps of Engineers (COE). The COE representative from the Charleston District stated that they do not have a continuous marine monitoring program. However, they do carry out site-specific projects within assigned geographic areas and these may be enhanced by regional monitoring plans. In the Charleston area their work is mainly in navigational channels and the benthic monitoring of some dredge material dumpsites.

The COE representative from the Mobile District stated that their marine pollution monitoring efforts are mainly short term for compliance. Longer term monitoring seldom exceeds four years since this usually is non-supportive of their missions. Site designation monitoring required by the Ocean Dumping Program is also short term and is conducted in cooperation with Interstate Electronics, Inc., of California. A monitoring plan is required for each dredge site to ensure that disposal to the ocean is acceptable. The major impact has been related to the physical mass movement of dredged material.

It was indicated that NOAA's monitoring programs should have more emphasis on COE dump sites for dredged material. A need for a Federally supported program for data quality assurance calibration and standardization was expressed.

U.S. Fish and Wildlife Service (FWS). It was reported that very little marine pollution monitoring is performed by FWS other than the gathering of pesticide data for their own purposes. However, the FWS Office of Biological Services has data available to aid decisions on specific site questions, such as the disposal of hazardous wastes.

Summary of Federal Session. EPA is involved in both ambient and compliance monitoring and with many special purpose studies. Fisheries protection is one of the region's highest priorities in coastal areas. EPA, like the states, expressed concern that there are few baseline data on

most of the estuaries and wetlands. The other Federal agency representatives reported very limited monitoring activities, usually site specific, on a short term basis, or for their own use.

A common theme among the Federal agencies related to data handling and storage. A more complete, timely, and available data base is urgently needed, including biological as well as water quality data. Also related to data handling are the needs for improved quality assurance and standardization of methods. EPA is addressing these needs through its STORET data base, its mandatory quality assurance program, and its prescribed analytical methods.

IV

PROPOSED APPROACH TO MEETING NATIONAL OCEAN POLLUTION MONITORING PROGRAM REQUIREMENTS

One of the stated objectives of the workshop was to assess the requirements for a region-wide ecosystem monitoring program, including a discussion of monitoring strategy options. In order to stimulate discussion among the participants on this topic, a background paper was presented on a proposed approach to meeting national ocean pollution monitoring program requirements. A key subprogram of the proposed national program is a regional ecosystem monitoring program. In a panel-led discussion, the participants were asked to consider and respond to the following questions:

1) What <u>are</u> the needs of region-wide ecosystem monitoring programs as we see them now?

2) How can existing programs (local, industry, state, Federal) be incorporated into region-wide monitoring programs?

3) What would be a cost-effective region-wide monitoring program?

4) What should be the roles of NOAA, EPA, other Federal and state agencies, industry, local government, and academic institutions in support of regional monitoring activities?

The proposed approach is briefly discussed below, followed by a summary of the participants' comments and responses during the panel discussion. Additional details on the proposed approach and its subprograms are presented in Appendix H.

A Possible Hierarchical Marine Pollution Monitoring Approach

A paper entitled, "A Recommended Direction for a National Marine Pollution Monitoring Program," by Swanson and O'Connor[2] suggested that the broad goal of a proposed national marine pollution monitoring program should be to assess the health of the ocean. They suggested a hierarchical approach to such a program that would consist of three separate efforts: 1) The use of the sentinel organism approach in a nationwide network; 2) Intensive monitoring of control areas and/or ecosystems (which would be

identified as critical impact areas based on the sentinel organism monitoring or other information); and 3) The incorporation of appropriate local (mostly compliance) monitoring results into the data base.

At the workshop, both the Swanson-O'Connor approach and an alternative based on this approach were presented. The basic strategy of both approaches is to incorporate information from existing programs where possible and initiate new programs only where necessary and justifiable by the expected results. The National Program, as proposed, would consist of a number of separate and distinct regional programs designed around regional needs. The hierarchical program approach would not subsume existing programs nor cause existing programs to be changed in a major fashion or be eliminated. The approach builds on existing programs and utilizes key information elements to satisfy broader, regional monitoring requirements. The most important functions of the National Program are coordination, integration, and synthesis of information. These would be facilitated through regional centers, operated as cooperative entities with participation from state and local groups and concerned Federal agencies. NOAA would provide leadership under its responsibilities persuant to the National Ocean Pollution Planning Act of 1978.

Participants' Response to Proposed Approach

In response to the hierarchical approach presented above, the workshop participants questioned if all the Gulf and South Atlantic problems have been adequately defined to support present and future regional plans which must be coordinated with the Second Federal Plan. Concern was expressed for the types of questions that are not being asked or assessed by present monitoring activities. Participants indicated that present programs should be evaluated to determine who is doing what and where as a first priority. Subsequent to this evaluation, needs could be better defined in terms of what improvements, coordination, etc., are needed. The overall opinion expressed by the participants was that there is no need for a regional program until a good data base on existing monitoring activities has been established.

There was considerable discussion on whether regional plans and programs should be designed totally at the regional level or with Federal support.

Concern was expressed that Federal funds for such a program would result in undesired Federal control. However, it was felt that any attempt at regional planning and coordination without the active participation and support of Federal agencies would probably not succeed.

NOAA's role in developing a regional monitoring program was seen as one of coordination, with their efforts directed toward the facilitation of information transfer and increased cooperation at the Federal, state, and local levels of government.

Public Law 95-273
95th Congress

An Act

May 8, 1978
[S. 1617]

To establish a program of ocean pollution research, development, and monitoring, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "National Ocean Pollution Research and Development and Monitoring Planning Act of 1978".

National Ocean Pollution Research and Development and Monitoring Planning Act of 1978.
33 USC 1701 note.

SEC. 2. FINDINGS AND PURPOSES.

33 USC 1701.

(a) FINDINGS.—The Congress finds and declares the following:

(1) Man's activities in the marine environment can have a profound short-term and long-term impact on such environment and greatly affect ocean and coastal resources therein.

(2) There is a need to establish a comprehensive Federal plan for ocean pollution research and development and monitoring, with particular attention being given to the inputs, fates, and effects of pollutants in the marine environment.

(3) Man will increasingly be forced to rely on ocean and coastal resources as other resources are depleted. Our ability to protect, preserve, develop, and utilize these ocean and coastal resources is directly related to our understanding of the effects which ocean pollution has upon such resources.

(4) Numerous departments, agencies, and instrumentalities of the Federal Government sponsor, support, or fund activities relating to ocean pollution research and development and monitoring. However, such activities are often uncoordinated and can result in unnecessary duplication.

(5) Better planning and more effective use of available funds, personnel, vessels, facilities, and equipment is the key to effective Federal action regarding ocean pollution research and development and monitoring.

(b) PURPOSES.—It is therefore the purpose of the Congress in this Act—

(1) to establish a comprehensive 5-year plan for Federal ocean pollution research and development and monitoring programs in order to provide planning for, coordination of, and dissemination of information with respect to such programs within the Federal Government;

(2) to develop the necessary base of information to support, and to provide for, the rational, efficient, and equitable utilization, conservation, and development of ocean and coastal resources; and

(3) to designate the National Oceanic and Atmospheric Administration as the lead Federal agency for preparing the plan referred to in paragraph (1) and to require the Administration to carry out a comprehensive program of ocean pollution research and development and monitoring under the plan.

33 USC 1702.

SEC. 3. DEFINITIONS.

As used in this Act, unless the context otherwise requires—

(1) The term "Administration" means the National Oceanic and Atmospheric Administration.

(2) The term "Administrator" means the Administrator of the Administration.

(3) The term "Director" means the Director of the Office of Science and Technology Policy in the Executive Office of the President.

(4) The term "marine environment" means the coastal zone (as defined in section 304(1) of the Coastal Zone Management Act of 1972 (16 U.S.C. 1453(1))); the seabed, subsoil, and waters of the territorial sea of the United States; the waters of any zone over which the United States asserts exclusive fishery management authority; the waters of the high seas; and the seabed and subsoil of and beyond the Outer Continental Shelf.

(5) The term "ocean and coastal resource" has the same meaning as is given such term in section 203(7) of the National Sea Grant Program Act (33 U.S.C. 1122(7)).

(6) The term "ocean pollution" means any short-term or long-term change in the marine environment.

SEC. 4. COMPREHENSIVE FEDERAL PLAN RELATING TO OCEAN POLLUTION.

33 USC 1703.

(a) LEAD AGENCY FOR PLAN.—The Administrator, in consultation with the Director and other appropriate Federal officials having authority over ocean pollution research and development and monitoring programs, shall prepare, in accordance with this section, a comprehensive 5-year plan (hereinafter in this Act referred to as the "Plan") for the overall Federal effort in ocean pollution research and development and monitoring. The Plan shall be prepared and submitted to Congress and the President on or before February 15, 1979, and a revision of the Plan shall be prepared and so submitted by February 15 of each odd-numbered year occurring after 1979.

Responsibility.

Submittal to President and Congress.

(b) CONTENT OF PLAN.—The Plan shall contain, but need not be limited to, the following elements:

(1) ASSESSMENT AND ORDERING OF NATIONAL NEEDS AND PROBLEMS.—The Plan shall—

National priorities.

(A) identify those national needs and problems, which relate to specific aspects of ocean pollution (including, but not limited to, the effects of ocean pollution on the economic, social, and environmental values of ocean and coastal resources), which exist and will arise during the Plan period;

(B) establish the priority, based upon the value and cost of information which can be obtained from specific ocean pollution research and development and monitoring programs and projects, in which such needs should be met, and such problems should be solved, during the Plan period; and

(C) contain, if pursuant to the preparation of any revision of the Plan required under subsection (a) it is determined that any national need or problem or priority set forth in the preceding version of the Plan should be changed, a detailed explanation of the reasons for the change.

(2) EXISTING FEDERAL CAPABILITY.—The Plan shall contain—

Existing Federal capability.

(A) a detailed listing of all existing Federal programs relating to ocean pollution research and development and monitoring (including, but not limited to, general research on marine ecosystems), which listing shall include, with respect to each such program—

(i) a catalogue of the Federal personnel, facilities, vessels and other equipment currently assigned to, or used for, the program, and

(ii) a detailed description of the existing goals and costs of the program, including, but not limited to, a categorical breakdown of the funds currently being expended, and planned to be expended, to conduct the program; and

(B) an analysis of the extent to which each such program, if continued on the basis and at the funding level described pursuant to subparagraph (A)(ii), will assist in meeting the priorities set forth pursuant to paragraph (1)(B) during the Plan period.

(3) POLICY RECOMMENDATIONS.—If it is determined, as a result of the analysis required to be made under paragraph (2)(B), that the priorities set forth pursuant to paragraph (1)(B) will not be adequately met during the Plan period using the existing Federal capability described pursuant to paragraph (2)(A), the Plan shall contain those recommendations for changes in the overall Federal effort in ocean pollution research and development and monitoring which would ensure that those priorities are adequately met during the Plan period. Such recommendations may include, but need not be limited to—

(A) changes in the goals to be achieved under various existing Federal ocean pollution research and development and monitoring programs;

(B) suggested increases and decreases in the funding for any such existing program consistent with the extent to which such program contributes to the meeting of such priorities;

(C) specific proposals for interagency cooperation in cases in which the pooling of the resources of two or more Federal departments. agencies, or instrumentalities under existing programs could further efforts to meet such priorities or would eliminate duplication of effort; and

(D) suggested legislation to establish new Federal programs considered to be necessary if such priorities are to be met.

Budget review.

(4) BUDGET REVIEW.—The Plan shall contain a description of actions taken by the Administrator and the Director to coordinate the budget review process for the purpose of ensuring interagency coordination and cooperation in (A) the carrying out of Federal ocean pollution research and development and monitoring programs; and (B) eliminating unnecessary duplication of effort among such programs.

"Plan Period."

(c) For purposes of this section, the term "Plan period" means—

(1) with respect to the Plan as required to be submitted on February 15, 1979, the period of 5 fiscal years beginning on October 1, 1978; and

(2) with respect to each revision of the Plan, the period of 5 fiscal years beginning on October 1 of the year before the year in which the revision is required to be prepared under subsection (a).

33 USC 1704.

SEC. 5. COMPREHENSIVE OCEAN POLLUTION PROGRAM IN THE ADMINISTRATION.

Establishment.

(a) ESTABLISHMENT OF PROGRAM.—The Administrator shall establish within the Administration a comprehensive, coordinated, and effective ocean pollution research and development and monitoring program. The Administrator shall carry out all projects and activities under the program in a manner consistent with the Plan.

(b) CONTENT OF THE PROGRAM.—The program required to be established under subsection (a) shall include, but not be limited to—

(1) all projects and activities relating to ocean pollution research and development and monitoring for which the Administrator has responsibility under provisions of law (including, but not limited to, title II of the Marine Protection, Research, and Sanctuaries Act of 1972 (33 U.S.C. 1441-1444)) other than paragraph (2);

(2) such projects and activities addressed to the priorities set forth in the Plan pursuant to section 4(b)(1)(B) that can be appropriately conducted within the Administration; and

(3) the provision of financial assistance under section 6.

SEC. 6. FINANCIAL ASSISTANCE.

33 USC 1705.

(a) GRANTS AND CONTRACTS.—The Administrator may provide financial assistance in the form of grants or contracts for research and development and monitoring projects or activities which are needed to meet priorities set forth in the Plan pursuant to section 4(b)(1)(B), if such priorities are not being adequately addressed by any Federal department, agency, or instrumentality.

Grants and contracts.

(b) APPLICATIONS FOR ASSISTANCE.—Any person, including institutions of higher education and departments, agencies, and instrumentalities of the Federal Government or of any State or political subdivision thereof, may apply for financial assistance under this section for the conduct of projects and activities described in subsection (a), and, in addition, specific proposals may be invited. Each application for financial assistance shall be made in writing in such form and manner, and contain such information, as the Administrator may require. The Administrator may enter into contracts under this section without regard to section 3709 of the Revised Statutes of the United States (41 U.S.C. 5).

Contract authority.

(c) EXISTING PROGRAMS.—The projects and activities supported by grants or contracts made or entered into under this section shall, to the maximum extent practicable, be administered through existing Federal programs (including, but not limited to, the National Sea Grant Program) concerned with ocean pollution research and development and monitoring.

(d) ACTION BY ADMINISTRATOR.—The Administrator shall act upon each application for a grant or contract under this section within six months after the date on which all required information is received by the Administrator from the applicant. Each grant made or contract entered into under this section shall be subject to such terms and conditions as the Secretary deems necessary in order to protect the interests of the United States. The total amount paid pursuant to any such grant or contract may, in the discretion of the Administrator, be up to 100 percent of the total cost of the project or activity involved.

(e) RECORDS.—Each recipient of financial assistance under this section shall keep such records as the Administrator shall prescribe, including records which fully disclose the amount and disposition by such recipient of the proceeds of such assistance, the total cost of the project or activity in connection with which such assistance was given or used, the amount of that portion of the cost of the project or activity which was supplied by other sources, and such other records as will facilitate an effective audit. Such records shall be maintained for three years after the completion of such project or activity. The Administrator and the Comptroller General of the United States, or any of their duly authorized representatives, shall have access, for the purpose of audit and examination, to any books, documents, papers, and

Recordkeeping.

Accessibility.

records of receipts which, in the opinion of the Administrator or of the Comptroller General, may be related or pertinent to such financial assistance.

33 USC 1706.

SEC. 7. INTERAGENCY COOPERATION.

The head of each department, agency, or other instrumentality of the Federal Government which is engaged in or concerned with, or which has authority over, programs relating to ocean pollution research and development and monitoring—

(1) shall cooperate with the Administrator in carrying out the purposes of this Act;

(2) may, upon written request from the Administrator or Director, make available to the Administrator or Director, on a reimbursable basis or otherwise, such personnel (with their consent and without prejudice to their position and rating), services, or facilities as may be necessary to assist the Administrator or the Director to achieve the purposes of this Act; and

(3) shall, upon a written request from the Administrator or Director, furnish such data or other information as the Administrator or Director deems necessary to fulfill the purposes of this Act.

33 USC 1707.

SEC. 8. DISSEMINATION OF INFORMATION.

The Administrator shall ensure that the results, findings, and information regarding ocean pollution research and development and monitoring programs conducted or sponsored by the Federal Government be disseminated in a timely manner, and in useful forms, to relevant departments, agencies, and instrumentalities of the Federal Government, and to other persons having an interest in ocean pollution research and development and monitoring.

33 USC 1708.

SEC. 9. EFFECT ON OTHER LAWS.

Nothing in this Act shall be construed to amend, restrict, or otherwise alter the authority of any Federal department, agency, or instrumentality, under any law, to undertake research and development and monitoring relating to ocean pollution.

33 USC 1709.

SEC. 10. AUTHORIZATION OF APPROPRIATIONS.

There are authorized to be appropriated to the Administration for the purposes of carrying out this Act not to exceed $5,000,000 for the fiscal year ending September 30, 1979.

Approved May 8, 1978.

LEGISLATIVE HISTORY:

HOUSE REPORTS: No. 95-626 pt. 1 (Comm. on Science and Technology) and 95-626 pt. 2 (Comm. on Merchant Marine and Fisheries).

CONGRESSIONAL RECORD:

Vol. 123 (1977): Aug. 3, considered and passed Senate.

Vol. 124 (1978): Feb. 28, considered and passed House, amended.

Apr. 24, Senate agreed to House amendment.

* U. S. GOVERNMENT PRINTING OFFICE : 1980 311-044/9

Appendix B

Monitoring Subcommittee Recommendations

One of the four working subcommittees formed by the Committee on Ocean Research, Development, and Monitoring (COPRDM) was the Subcommittee for Monitoring. This subcommittee was given responsibility for identifying all relevant Federal programs in the area of ocean pollution monitoring, for analyzing them in terms of what extent they meet national needs and priorities, and for recommending how to improve the Federal R,D&M programs.

The recommendations made by the Monitoring Subcommittee are as follows:

1) For effective planning of the Federal program, an inventory should be made of the local, private industry monitoring, and the local and state government agency activities.

2) A better use should be made of the existing monitoring activities, and any regional monitoring plan should include these activities. The principal idea is to promote cooperation, coordination, and the use and incorporation of existing activities, as opposed to starting new programs that may be duplicative.

3) Monitoring data should be shared, should be pooled into regional data banks, and efforts should be made to analyze and interpret existing data. The emphasis is to convert data and information into formats that are useable for management decisions.

4) Marine pollution monitoring programs should be coordinated nationally, but this national monitoring program should be the sum of the regional programs.

5) Steps to establish regional (region-wide) monitoring programs were defined: First, assessment and management of existing programs must be coordinated; second, regional plans should be developed that identify a lead agency and all participating organizations, including their functions; and third, implementation of regional programs should be phased, with highest priority given to the areas with the most need.

Appendix C

Summary of the Summer, 1980, South Atlantic and Gulf Region Conference

The NOAA/National Marine Pollution Program Office (NMPPO) held five regional meetings during the Summer of 1980 in order to develop regional needs and priorities for a Second Federal Plan on ocean pollution R,D&M. One of these meetings, the South Atlantic and Gulf Region Conference on Marine Pollution Problems[1], was held in New Orleans on June 10-12, 1980. This three-day meeting was hosted by the Louisiana State University Sea Grant program, working with NOAA staff. Fifty-three pollution and marine resource specialists representing academia, regulatory agencies, industries, and environmental organizations attended this conference. The areal scope of the conference included the South Atlantic coastal area (from North Carolina to Southern Florida), the entire Gulf of Mexico (from Key West, Florida to Brownsville, Texas), Puerto Rico, and the Virgin Islands.

The objectives of the South Atlantic/Gulf Conference were to characterize the nature and magnitude of regional marine pollution problems, to identify the information required to manage these problems, and to assign priorities to the information needs. The conference was organized into four panels to cover regional marine pollution issues. The issues addressed by these panels are given below.

Coastal Habitat Protection

This panel considered impacts of pollution on near-shore and ocean waters resulting both from specific discharges into the coastal environment and from non-point source pollution. Also considered were the pressures resulting from the multiple uses of coastal areas, including urban and industrial development as well as energy and mining activities. In addition, this category included the source of contaminants carried into the coastal areas by the rivers.

Marine Resource Utilization

This panel covered pollution impacts derived from routine marine resource exploration and production activities, including petroleum hydrocarbon development and deep-sea mining. Impacts considered were

chronic, low level releases of petroleum hydrocarbons, brine and/or heat discharge that would occur with coastal oil storage operations, and possible future alternate energy production technologies, such as tapping deep geothermal pools in coastal regions. Marine resources and uses under this heading included fisheries, heated water (surface and subbottom), waves, tides, and currents, ocean minerals (sulfur, deep-sea minerals, sand, shell, and gravel), and recreational activities.

This panel addressed chemical and petroleum hydrocarbon spills that usually occur as a result of accidents, but are also common as unpermitted releases such as associated with tankers and near-shore industrial activities. The major pollution issues considered were associated with marine transportation, effluent and sewage discharges, and the oil/gas/chemical industries.

Marine Waste Disposal

Topics covered by this panel included the permitted disposal of wastes and other materials in estuarine, near-shore, and ocean waters. Examples are sewage wastewater and power plant cooling water outfalls, industrial discharges, and dredged or other materials dumped in designated ocean disposal areas. For the South Atlantic region the major sources of marine pollution are the discharges of sewage wastewater and industrial wastes. In the Gulf States, disposal of dredged materials is the most serious concern.

Discussion of Conference Results

The conference focused primarily on marine pollution research needs. However, one panel did clearly indicate a mutually supportive relationship between research and monitoring and strongly endorsed the definition of marine pollution given in the Interagency Monitoring Subcommittee Report. Also, the panel, as a general recommendation, expressed its support of monitoring as a high-priority need.

The primary output of the conference was a list of information needs accompanied by statements of rationale. In examining the more than 60 information needs statements in the conference report, about 25 were related to monitoring. (Since the objectives were to identify research needs, relatively few pertained exclusively to monitoring.) Most of the monitoring-related needs identified can be grouped into five categories.

These are: 1) dredged material disposal; 2) energy and other mineral resource activities; 3) the chemical manufacturing and transport industry; 4) waste disposal; and 5) development of monitoring methods, including physical, chemical, and biological measurements, the technology required, and evaluation of monitoring efforts. Selected examples of monitoring needs from the June conference are given below.

1) Need: Develop a chemical monitoring program to measure pollutant levels in near-shore systems. Rationale: Because of the increasing input of chemicals into the near-shore environment, it is becoming increasingly more important to establish baseline levels and to monitor their increase over time. The monitoring of chemical levels will probably provide a more sensitive indicator than attempting to monitor biological systems.

2) Need: Identify coastal shipping routes for chemicals, including quantity and frequency. The regional monitoring program for key chemicals should include the most frequent transportation routes. Rationale: Because of the large quantity of chemicals transported in the highly sensitive near-shore areas, there is a considerable need to define exactly what materials are being transported, in what quantities, and in what areas. This is an essential first step in planning future pollution monitoring and research programs. The increasing transportation of these materials in the near-shore area has created a high probability of spillage.

3) Need: Improve monitoring of permitted ocean dumping and at-sea incineration of specific wastes. Rationale: Monitoring requirements to verify effects and proper dumping procedures are often lacking. Effects are thus relatively unknown.

4) Need: Standardize methods and measurements. Rationale: A problem cutting across many research and monitoring activities is the lack of standards for measurements and methods of measurements. This includes intercalibration, standardization of methodology and information retrieval, reporting error or uncertainty.

5) Need: Develop early warning monitoring techniques for detecting environmental changes, including pathological and biochemical changes in selected organisms. Rationale: At present, normal indications of stress that are observed within ecosystems may, in fact, occur too late for the implementation of protective measures. It is important that more sensitive and subtle warning signs be monitored.

Appendix D

Names and Addresses of Monitoring Workshop Participants

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Appendix E

List of Invitees

Federal Agencies

Coast Guard, Miami, FL
Corps of Engineers, Atlanta, GA; Charleston, SC; Mobile, AL; and Vicksburg, MS
Environmental Protection Agency, Athens and Atlanta, GA
Fish and Wildlife Service, Atlanta, GA; Charleston, SC; and Panama City, FL
Geological Survey, St. Simons, GA
National Oceanic and Atmospheric Administration
- -Atlantic Oceanographic and Meteorological Laboratory, Miami, FL
- -Environmental Data and Information Service, Miami, FL
- -National Earth Satellite Service, Washington, DC
- -National Marine Fisheries Service, Beaufort, NC and Washington, DC
- -National Marine Pollution Program Office, Rockville, MD
- -National Ocean Survey, Rockville, MD
- -Ocean Technology and Engineering Services, Rockville, MD
- -Office of Marine Pollution Assessment, Boulder, CO; Rockville, MD; and NSTL Station, MS

National Park Service, Atlanta, GA
Naval Facilities Engineering Command, Charleston, SC

State Agencies

Alabama Coastal Area Board, Daphne, AL
Alabama Department of Conservation, Dauphin Island, AL
Alabama Geological Survey, University, AL
Alabama (South) Regional Planning Commission, Mobile, AL
Alabama Water Improvement Commission, Montgomery, AL
Florida Department of Environmental Regulation, Tallahassee, FL
Florida Department of Natural Resources, Tallahassee and St. Petersburg, FL
Georgia Department of Natural Resources
- -Environmental Protection Division, Atlanta, GA
- -Coastal Resources Division, Brunswick, GA

Mississippi Bureau of Marine Resources, Long Beach, MS
North Carolina Department of Human Resources, Morehead City, NC
North Carolina Department of Natural Resources, Raleigh, NC
South Carolina Coastal Council, Columbia, SC
South Carolina Department of Health and Environmental Control, Columbia, SC
South Carolina Governor's Office - Coastal Energy Impact Program, Columbia, SC
South Carolina Wildlife and Marine Resources Department, Charleston, SC

Universities

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Florida State University - Department of Oceanography, Tallahassee, FL
Louisiana State University - Center for Wetland Resources, Baton Rouge, LA
Louisiana Universities Marine Consortium, Chauvin, LA
Mississippi-Alabama Sea Grant Consortium, Ocean Springs, MS
North Carolina State University - Department of Marine Sciences and Engineering, Raleigh, NC
Skidaway Institute of Oceanography, Savannah, GA
University of Alabama - Marine Environmental Sciences Consortium, Mobile, AL
University of South Carolina - Baruch Institute, Columbia, SC

Industries

American Cyanamid Co., Wayne, NJ
Carolina Power & Light Co., New Hill, NC
Chevron Refinery, Pascagoula, MS
Continental Shelf Associates, Inc., Tequesta, FL
Florida Power & Light Co., Miami, FL
International Paper Co., Mobile, AL and Tuxedo Park, NY
Jones, Edmunds, & Associates, Gainesville, FL
Mobay Chemical Corporation, Charleston, SC
Savannah River Plant, Aiken, SC
Science Applications, Inc., Raleigh, NC
SEAMOcean, Wheaton, MD
Shell Oil Co., Houston, TX
Southwest Research Institute, Houston, TX
Vittor & Associates, Mobile, AL
Weyerhaeuser, New Bern, NC

Local/Municipal Agencies

Broward County Environmental Control Board, Ft. Lauderdale, FL
Dade County Environmental Resources Management Department, Miami, FL
Hillsborough County Environmental Protection Commission, Tampa, FL
Palm Beach County Health Department, West Palm Beach, FL
Sarasota County Department of Pollution Control, Sarasota, FL
Tampa Water Resources & Public Works, Tampa, FL

Public Interest and Other Organizations

Florida Audubon Society, Maitland, FL
The Georgia Conservancy, Savannah, GA
Gulf of Mexico Fishery Management Council, Tampa, FL
Marine Wilderness Society, Miami, FL

Appendix F

A G E N D A

OVERVIEW OF REGIONAL MARINE POLLUTION MONITORING REQUIREMENTS

Sponsored by NOAA and EPA Region IV

January 27-28, 1981

Marriott Hotel - Atlanta, Georgia

Co-Chairmen:	Charles G. Gunnerson NOAA/Office of Marine Pollution Assessment	James H. Finger EPA Region IV, Surveillance and Analysis Division

Monday, January 26

6:00-7:00 PM	Preliminary meeting of sponsors, chairmen, moderators, and speakers.	

Tuesday, January 27

8:00 AM	Registration	
8:30	Welcome & Introductions	Charles Gunnerson James Finger
8:45	The Federal Plan (P.L. 95-273); Interagency Monitoring Subcommittee Definitions; & Workshop Objectives	George Peter NOAA/OMPA
9:30	Summary of NOAA/NMPPO Gulf/South Atlantic Region Workshop	Robert P. Gambrell LSU
9:45	Coffee break	
10:00	Some Criteria for Evaluating Marine Pollution Monitoring Needs	Charles Gunnerson
10:15	Some Approaches for Regionwide Monitoring	Douglas A. Segar SEAMOcean
10:45	Group Discussion	
11:30	Lunch break	

Local/Municipal and Industry Programs: Moderator - George Peter

(Speakers will address questions in Attachment A)

1:00 PM	Hillsborough County Environmental Protection Commission	Roger Stewart
1:15	Palm Beach County Health Dept.	Jim Barry/Shirley Fields
1:30	Dade County Environmental Resources Management Dept.	Robert Karafel
1:45	Continental Shelf Associates, Inc.	Larry Hawkins
2:00	Discussion: Input from floor	
2:45	Coffee break	

Tuesday, January 27 (Cont.)

State Programs: Moderator - Noel Hurley (S.C. Department of Health & Environmental Control)

(Speakers will address questions in Attachment A)

3:00 PM	Alabama Coastal Area Board	Tim Savage
3:15	S.C. Dept. of Health & Environmental Control	Russell Sherer
3:30	N.C. Dept. of Human Resources/ Shellfish Sanitation	Bob Benton
3:45	Florida Dept. of Natural Resources	George Henderson
4:00	Discussion: Input from floor	
4:45	Adjourn	
5:00	Social Hour	

Wednesday, January 28

Federal Programs: Moderator - Reg Rogers (EPA Region IV)

(Speakers will address questions in Attachment A)

8:30 AM	EPA Region IV	David Hill
8:45	Corps of Engineers - Charleston District	Steve Morrison
9:00	Corps of Engineers	Bob Engler
9:15	U.S. Fish and Wildlife Service	Don Schultz/ Waynon Johnson
9:30	Discussion: Input from floor	
10:00	Coffee Break	

Wednesday, January 28 (Cont.)

Panel I: Questions Concerning Regionwide Ecosystem Monitoring. George Peter-Chairman. Panelists (to be selected at workshop) and audience will address the following:

10:15 AM	What are the needs of regionwide ecosystem monitoring programs as we see them now?
10:35	How can existing programs (local, industry, state, federal) be incorporated into regionwide monitoring programs?
10:55	What would be a cost-effective regionwide monitoring program?
11:15	What should be the roles of NOAA, EPA, other federal and state agencies, industry, local government, and academic institutions in support of regional monitoring activities?
11:45	Lunch Break

Panel II: Questions Concerning Present Programs. Duane Simpson-Chairman. Panelists (to be selected at workshop) and audience will address the following:

1:15 PM	What are the information requirements and how are they determined for the various types of monitoring activities? Are the requirements adequately met? Can the scope of programs be expanded to promote broader utility of data?
1:35	What are the rationale and statistical design of present programs? Is there enough flexibility to allow for modification to achieve greater efficiency and usefulness of the programs?
1:55	What are the ultimate use and disposition of data gathered by the various types of programs? Can you see utility in a central data depository and distribution facility serving your region?
2:15	What areas of new technology could assist your program in particular and could improve the cost-effectiveness of monitoring programs in general?
2:30	Conclusions and Closing Comments
3:00	Adjourn

Attachment A

Speakers should address the following questions during their presentation.

1. Are you a collector of monitoring data? A user? Neither?

2. What marine pollution monitoring activities do you conduct and what are their rationale (environmental problems, geographical area coverage, number of stations, sampling frequency (statistical design), types of data, types of data analyses), their ultimate use, availability, and disposition of data and information?

3. Who are the users of your monitoring information, and how do they use the data?

4. How effectively are your monitoring data and information used in decision making (time delay from measurements to action, contributing factors in addition to monitoring data)?

5. What are the resource requirements for your present monitoring programs? What are the sources of your major funds?

6. What new monitoring activities (modification of programs, new programs, program coordination, synthesis and information dissemination, change of pollutant emphasis, etc.) do you feel are necessary to address local and regional marine pollution problems, needs, and priorities, including those identified at the recent NOAA/NMPPO workshop?

7. What are your needs in terms of improved technology?

Appendix G

Definition of Terms

Monitoring Subcommittee Definitions

In order to provide a reference level to the participants of the Monitoring workshop for such terms as monitoring and research, the definitions from the Interagency Monitoring Subcommittee Report were used. These are presented and discussed below.

Marine Pollution is the condition brought about directly or indirectly by human activities in the marine environment (including estuarine waters and the Great Lakes) that may result in hazard to human health, harm to living resources and ecosystems, hinderance to fishing and other marine activities, impairment of quality for use of seawater, and reduction of recreational and aesthetic amenities. Marine pollution monitoring is the continual systematic, time-series observation of predetermined pollutants or pertinent components of the marine ecosystem over a period sufficient to determine the existing level, trend, and natural variations of the measured components in the water column, sediments, or biota. In order to allow further distinction between research and monitoring, the definitions of the basic purpose of monitoring and research were given. The basic purpose of monitoring marine pollution is to obtain time-series data sets that can be used to detect significant change in the environment, and to use this information to provide timely warning and other advice to management so that appropriate actions may be taken. On the other hand, the basic purpose of research is to obtain fundamental understanding, to develop baseline information, or to develop practical applications relative to the observed phenomena.

Although they need to be separated, marine pollution monitoring and research are clearly mutually supportive. In many cases, to initiate monitoring programs, research programs are needed first to determine what components of the ecosystem and what pollutants should be monitored; what the frequency of the observations should be; how long a phenomenon should be observed and in what area; and how the observations should be interpreted.

Where extensive research information exists in an area, the monitoring program design is benefited, yielding cost-effective strategies, greater sensitivity of the parameters, and realistic spatial and temporal sampling schemes. Where extensive monitoring precedes research, monitoring information suggests good working hypotheses regarding cause-effect relationships that can be further tested by research programs.

Research vs. Monitoring

While the "purpose" definitions separated research from monitoring, the Interagency Monitoring Subcommittee still had difficulty identifying monitoring programs because research and monitoring activities in a given program often occurred together. The Subcommittee finally decided to identify monitoring programs and monitoring-related research and development programs, and separated these from other research and development activities for inclusion in the Subcommittee Report. The ratio between Federal monitoring programs and monitoring-related programs in FY 1978 was $18 M and $41 M, respectively.

Categorization of Monitoring Activities

The categorization of monitoring activities in the Subcommittee Report is based on the practical characteristics of the monitoring acitvity itself. The types of monitoring that were identified are the following:

1) Pollutant input monitoring: This is source or effluent monitoring, and most of the compliance monitoring activities belong here.

2) Monitoring of the local marine ecosystems: The receiving waters monitoring, which may be part of compliance monitoring, and the local, ambient water and ecosystem monitoring activities are included here. Included are such activities as measurements of pollutants in the environment and in the animals (including pathogenic organisms), and the measurement of effects, such as behavior, physiology, biochemistry, pathology, genetics, etc. Most of the research activities to develop monitoring strategies and to determine cause-effect relationships are related to this type of monitoring.

3) Monitoring of food resources: The Food and Drug Administration (FDA) and the National Marine Fisheries Service (NMFS) programs to control harvesting areas and to determine seafood safety for human consumption belong to this category.

4) Monitoring of spills of hazardous materials: This is the short-term surveillance activity to monitor oil or other hazardous substance spills. It is usually a crisis response activity, not pre-planned, not conducted long enough to be considered regular monitoring, and perhaps should not be included here. In reality, these activities belong to the U.S. Coast Guard (USCG) spill-response program. When the Subcommittee advocated coordination or integration of monitoring activities, it carefully pointed out that this category is not included, and that interference with the USCG's spill-response activities is not suggested.

5) Monitoring of regional ecosystems: This is the long-term large-area, coordinated watch on the regional health of the ecosystem. It was emphasized that this program is largely lacking at the present and that it should be established in high-priority areas. While "ecosystem health" may be a controversial and difficult to define term, this monitoring category basically should include programs for a long-term commitment to watch key ecosystem components, check for pollutants, and use the information for a long-term data base and for early detection of potential problems. Existing monitoring stations from the other categories should be utilized as far as practicable, and the efforts of coordination, co-operation, data sharing, and joint planning should lead ultimately to simpler, more cost-effective monitoring strategies across the board.

Appendix H

Proposed Approach to Meeting National Ocean Pollution Monitoring Program Requirements

One of the stated objectives of the monitoring workshop was to assess the requirements for a region-wide ecosystem monitoring program, including a discussion of monitoring strategy options. In order to stimulate discussion among the participants on this topic, a background paper was presented on a proposed approach to meeting national ocean pollution monitoring program requirements. The major elements of the proposed approach are presented below.

A Possible Hierarchical Marine Pollution Monitoring Approach

A paper entitled, "A Recommended Direction for a National Marine Pollution Monitoring Program," by Swanson and O'Connor[2] suggested that the broad goal of a proposed national marine pollution monitoring program should be to assess the health of the ocean. They suggested a hierarchical approach to such a program that would consist of three separate efforts: 1) The use of the sentinel organism approach in a nationwide network; 2) Intensive monitoring of control areas and/or ecosystems (which would be identified as critical impact areas based on the sentinel organism monitoring or other information); and 3) The incorporation of appropriate local (mostly compliance) monitoring results into the data base.

At the workshop, both the Swanson-O'Connor approach and an alternative based on this approach were presented. The basic strategy of both approaches is to incorporate information from existing programs where possible and initiate new programs only where necessary and justifiable by the expected results. The National Program, as proposed, would consist of a number of separate and distinct regional programs designed around regional needs. The hierarchical program approach would not subsume existing programs nor cause existing programs to be changed in a major fashion or be eliminated. The approach builds on existing programs and utilizes key information elements to satisfy broader, regional monitoring requirements. The most important functions of the National Program are coordination, integration, and synthesis

of information. These would be facilitiated through regional centers, operated as cooperative entities with participation from state and local groups and concerned Federal agencies. NOAA would provide leadership under its responsibilities persuant to the National Ocean Pollution Planning Act of 1978.

Purposes of the Hierarchical Monitoring Program

The general objective of a marine monitoring program should be to provide information useful to ocean pollution management decisions. Because such decisions range from global policy concerning the production, use, and disposition of synthetic organic chemicals to decisions affecting the location of a storm discharge pipe, no single monitoring system could directly respond to the entire range of management needs. It is necessary, therefore, to focus the objectives of the national monitoring program:

1) Management and control of local impacts of waste discharges and other polluting activities and protection of public health (from seafood or bathing water contamination) should be maintained via compliance monitoring programs.

2) Assessment of contaminant concentrations in the marine ecosystem to ensure that significant long-term trends are identified should be made via the use of carefully selected data from the existing compliance monitoring programs, supplemented by a few new sampling stations identified by regional planning.

3) Understanding of the nature of the marine ecosystems to identify their assimilative capacity and major variations (whether natural or human induced) can be achieved via the utilization of data from the monitoring programs outlined above, and from academic, state, and Federal research programs.

Key Subprograms of the Hierarchical Approach

The key subprograms of the proposed hierarchical approach are described in the following paragraphs.

Compliance Monitoring. Compliance monitoring, including human health protection monitoring, serves the specific purpose of establishing compliance

with the standards applicable to the particular activity monitored. Compliance monitoring programs are themselves diverse, ranging from simple chemical testing to detailed ecological structure characterization performed on a continuing basis. A National Monitoring Program cannot and should not replace or subsume compliance monitoring programs. However, compliance monitoring data should be incorporated in a regional marine monitoring data base. Access to the data base by compliance monitors should be facilitated and encouraged such that maximum use is made of available data. The cost and complexity of compliance monitoring should, over time, be reduced as the understanding of marine ecosystems improves and simplifying amendments are made to statutes and regulations to reflect such improved understanding.

Pollutant Concentration Trend Monitoring. Long-term trends of pollutant concentrations in marine ecosystems must be established. The simplest and perhaps least expensive means of doing this in the long term is by prediction, based upon an understanding of pollutant pathways in marine ecosystems and detailed knowledge of the pollutant input routes and rates. The most promising techniques for independent trend assessment is the sentinel organism methods, of which the mussel watch program is a crude prototype. Research should be continued to perfect these types of techniques, and a national program should be instituted if and when the techniques are proven. In the interim, reliance should be placed on results of compliance monitoring, research programs, and knowledge of inputs. In addition, broad scan analysis of a minimal (less than 200 or 300 per year nationwide) number of sediment and biological samples should be performed to detect any drastic changes in pollutant concentration. Such samples should be taken annually from carefully selected areas with a high potential for impact.

Ecosystem Understanding Development. Major multi-year ecosystem investigations aimed at understanding specific marine ecosystem functioning should continue to be performed. The NOAA/MESA New York Bight study, the SCCWRP study off Southern California, and the EPA Chesapeake Bay Program are examples of such ecosystem investigations. Careful choices must be made of areas to be subjected to such detailed studies and these should be implemented on an "as needed" basis.

Regionwide Ecosystem Monitoring. Compliance monitoring provides the information required to identify any major near-field ecological change but does not often adequately address the potential for long-term, region-wide changes. A monitoring program that would identify long-term subtle ecological changes which take place anywhere within the U.S. coastal marine ecosystem would be prohibitive in cost and manpower. Therefore, the objective is to identify major ecological changes and establish with adequate certainty whether such changes were or may have been caused by natural variability. The first part of this objective can be substantially achieved through the use of existing programs (i.e., fisheries and shellfisheries surveys, catch statistics, kelp bed resource surveys, habitat surveys) with inputs from compliance monitoring and ecosystem research studies. Limited additional monitoring surveys may be necessary in key areas of critical habitats (i.e., kelp beds, coral reefs, and coastal marshes) and should be set up through the various Federal, state, local and private resource management programs. The results of all resource monitoring programs should be incorporated as an input to the hierarchical marine monitoring program.

Regionwide ecosystem monitoring should be aimed at detecting major natural changes which are "climatically" controlled. In the ocean this means water mass movement, which affects physical and chemical control of primary production, which in turn affects upper levels of the food chain. The time scales on which such changes occur and have major ecological impacts are season to season and over periods of years in concord with climatology. The major possible exception to this rule is disease which is known to be responsible for major ecological changes, but which is probably also mediated by physical and chemical changes in the environment.

There exists a need for rapid hindcasting of information to decide whether or not natural variability or changes in the ecosystem were or could have been responsible for marine ecological changes or crises. From an understanding of the natural changes in physical water mass characteristics and basic chemical characteristics, and based on current knowledge of marine ecosystems, hindcasting can probably be done with considerable accuracy.

A regional ecosystem monitoring program such as that described would have a number of desirable characteristics including:

1) Simplicity sampling and analysis carried out without major commitments of high technology resources or highly trained manpower;

2) Relative ease of interpretation and data handling due to limited number of parameters measured;

3) Ability to perform from moving vessels and/or aircraft; Reduced shiptime required; Minimal vessel capabilities needed;

4) Ease of standardization of techniques and intercalibration; Ease of intercomparability and merging of data with data from other monitoring and research programs.

All of the benefits translate into major cost savings over more "comprehensive" programs. In addition, the proposed regional ecosystem monitoring program would provide basic information needed for a number of other areas of ocean management, particularly fisheries management, but also marine meteorology, beach restoration and preservation, marine transportation planning, and marine energy production planning. Implementation of a regionwide marine monitoring program would be gradual, taking place region by region. It is estimated that perhaps 20-30 years would be needed to establish such programs throughout the U.S. coastal marine areas, during which time the program would undergo continuous evaluation and modification.

Coordination of Subprograms

Information generated by each of the subprograms, each with its own many component pieces, must be integrated and the problems themselves coordinated. It was proposed to do this on a regional basis through Regional Marine Pollution Centers since the majority of marine pollution problems are local or regional in scale. Even those problems that are found in all regions of the nation (e.g., municipal wastewater discharge) differ from region to region, and to an extent locally, because of the widely different characters of coastal marine ecosystems among the regions. NOAA would serve as a catalyst for and provide needed support for the development of regionwide coordination mechanisms.

Coordination would require active participation by state, local, academic, public interest, and private interests within the region.

NOAA's principal aim would be, therefore, to encourage regional interests to define for themselves the details of the coordination activities. This could be achieved through the establishment, with NOAA support, of regional coordinating councils or committees who would develop the details of the regional monitoring plans. In addition, NOAA could investigate how to improve the necessary data and information services within the regions to serve both Federal and other interests. The details of these regional coordination entities are yet to be defined. However, the establishment of such integration and coordination capabilities is an essential and integral component of the proposed hierarchical monitoring program.

Summary of Hierarchical Approach

The hierarchical approach to a National Marine Pollution Monitoring Program was presented to the workshop participants as a means by which to satisfy the goal of providing sufficient information such that the health of the ocean can be maintained through appropriate management of pollution. The program would require only limited additional expenditures of money and trained manpower. Cost savings through optimization of some existing programs, particularly compliance monitoring programs, could potentially more than offset such additional expenditures.

The program is aimed at the long-term problem, and it's benefits reach decades into the future. It probably would not and could not satisfy all current management information needs, but these current needs probably could not be totally satisfied anyway with any reasonable level of effort. A critical underlying assumption of the hierarchical program is that the new and largely untested system of environmental laws and regulations (including but not limited to marine environmental laws) established during the 1970's will, given time, reduce the inputs of pollutants to the oceans, reduce the potential for surprise pollutants, and lead to much better knowledge of the inputs that do remain. The proposed program is designed to continue to operate beyond the period when these gains will be made, and to enable effective management of the ocean as an appropriate resource for the disposal of some of man's wastes.

Appendix I

Letters Received from Workshop Participants

State of South Carolina

Office of the Governor

RICHARD W. RILEY
GOVERNOR

OFFICE OF EXECUTIVE
POLICY AND PROGRAMS

February 4, 1981

Mr. Charles Gunnerson
Environmental Engineering Advisor
NOAA/ERL
Boulder, Colorado 80303

Dear Mr. Gunnerson:

I am writing both to thank you for the articles you so promptly sent and to reiterate some of my thoughts about regional monitoring systems. As regards the former, they arrived yesterday and look interesting. The small reprint, in particular, supports many of the things we have been saying for quite some time.

I was also interested in Bob Engler's remarks about the incompatability of the STORET and NOAA data systems. Unfortunately, our early departure precluded my discussing it with him. Do you know of anything which documents these problems?

The overview sessions were interesting, albeit a bit frustrating. It seemed that many of the speakers were saying that monitoring data weren't used, or weren't used well, yet were agreeing that more monitoring systems are needed. I had the unsettling feeling while listening to many of the speakers that process had outstriped substance in importance, which may explain why monitoring data is used so infrequently.

It seems to me that the best use of both dollars and manpower would be to improve the accessibility and usefulness of systems now in existence, rather than adding the extra "layer" of monitoring required by a regional system. Any regional program should be directed toward coordinating existing efforts (to preclude incompatability between two systems for example) and making existing information readily available to all potential users. This may require presenting the same data and/or information in several different formats, but the benefits derived from increasing the number of users would undoubtedly outweigh the costs of developing multiple storage and access systems.

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Finally, the usefulness of ongoing monitoring programs could be greatly increased if the programs took into account both the scientific and regulatory applications of the data. At present, numerous opportunities for multiple use of data are being lost because gathering efforts are geared toward regulatory functions ratner than some "golden mean" which would serve regulatory purposes but would also provide data useful for research. Obviously, cost is a factor which can't be taken lightly; however, it does seem that in at least some instances, data gathering could serve two purposes with little or no additional cost. Perhaps a regional monitoring program could be used to integrate the two functions more effectively.

Thank you once again for the articles. I enjoyed meeting you and hope to see you again.

Best regards,

Patricia L. Jerman
C.E.I.P. Director

PLJ/jbh

Appendix J

List of References

1. Report of South Atlantic and Gulf Region Conference on Marine Pollution Problems, New Orleans, LA, June 10-12, 1980, National Marine Pollution Program Office, Rockville, MD, September, 1980.

2. A Recommended Direction for a National Marine Pollution Monitoring Program, R. Lawrence Swanson and Joel S. O'Connor, (unpublished), Office of Marine Pollution Assessment, Rockville, MD, 1980.

Appendix K

List of Acronyms

BLM	Bureau of Land Management
COE	Corps of Engineers
COPRDM	Committee on Ocean Pollution Research, Development and Monitoring
EPA	Environmental Protection Agency
FWS	Fish and Wildlife Service
MESA	Marine Ecosystems Analysis
NMFS	National Marine Fisheries Service
NMPPO	National Marine Pollution Program Office
NOAA	National Oceanic and Atmospheric Administration
OCS	Outer Continental Shelf
OMPA	Office of Marine Pollution Assessment
R,D&M	Research, Development and Monitoring
SCCWRP	Southern California Coastal Water Research Project
USCG	U.S. Coast Guard