



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
THE ADMINISTRATOR

July 30, 1991

EPA-SAB-EPEC-91-012

The Honorable William Reilly
Administrator
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

Dear Mr. Reilly,

The Marine Disease/Diagnostic Task Group of the Ecological Processes and Effects Committee of the Science Advisory Board has completed its review of a proposal for establishing a National Center for Marine and Estuarine Disease Research at EPA's Gulf Breeze Environmental Research Laboratory in Gulf Breeze, Florida. The center was proposed out of scientific and public awareness that human populations and actions in coastal areas are having detrimental impacts on some aquatic resources in coastal regions of the United States. Currently, there is no centralized Federal program to assure that technical knowledge and expertise is available to investigate and address these impacts.

The Task Group was asked to review the concept of the proposed center, its scope, objectives, and plans for implementation for relevance to the overall needs and feasibility. The Group received the draft proposal in January and met at Gulf Breeze on February 19 and 20, 1991 for briefings and a tour of the existing facilities.

The task Group agrees that there is a need to establish a center for research in marine and estuarine diseases. However, because there are many organizations currently involved in one or more aspect of such research, the Task Group recommends that this facility be identified as an EPA center, not a National Center. Overall, the Task Group found that the proposal was very generic, lacking details on how the goals would be accomplished. In addition, the scope was overly broad and significant revisions were recommended. The Task Group recommended that the priorities for the center be revised and that research projects should be developed within the context and operational framework of EPA's Reducing Risk program. Expertise within EPA, other Federal agencies, states, private institutions, and

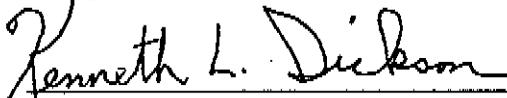
EPA's Reducing Risk program. Expertise within EPA, other Federal agencies, states, private institutions, and universities should be integrated into this new GBERL program through extramural research, planning, and peer review activities.

The development of an EPA Center for Marine and Estuarine Disease should be an important step toward understanding how the ecological integrity of coastal aquatic ecosystems could be threatened by anthropogenic induced stresses. We look forward to your consideration of our recommendations and to the successful development of such a center.

Sincerely,



Dr. Raymond Loehr, Chairman
Chairman
Science Advisory Board



Dr. Kenneth Dickson,
Ecological Processes and
Effects Committee



Dr. Richard A. Kimerle, PhD.
Chairman
Marine Disease/Diagnostic
Task Group



EPA

**U.S. Environmental
Protection Agency**

**Washington, DC
EPA-SAB-EPEC-91-012**

**Report of The
Marine Disease Diagnostic
Task Group of The
Ecological Processes and
Effects Committee**

**Evaluation of The
Proposed Center for Marine
and Estuarine Disease
Research**

U.S. ENVIRONMENTAL PROTECTION AGENCY
NOTICE

This report has been written as a part of the activities of the Science Advisory Board, a public advisory group providing extramural scientific information and advice to the Administrator and other officials of the Environmental Protection Agency. The Board is structured to provide a balanced expert assessment of scientific matters related to problems facing the Agency. This report has not been reviewed for approval by the Agency; and, hence, the contents of this report does not necessarily represent the views and policies of the Environmental Protection Agency or other Agencies in the Federal Government. Mention of trade names or commercial products do not constitute a recommendation for use.

ABSTRACT

This report presents the conclusions and recommendations of the U.S. Environmental Protection Agency's Science Advisory Board following a review of an EPA proposal for a national center for marine and estuarine disease research. The Task Group agreed that there is a need for a center related to diseases of marine and estuarine organisms and that the Gulf Breeze Environmental Research Laboratory was a logical site for an EPA center. The Task Group was concerned that in order to achieve the desired results the proposal needed to be revised. They recommended that the scope of the proposal be reduced, more details be added, and that the pathobiology group reach out to other technical areas for support and ideas in the planning and implementation stage. Strategies on how each of the proposed programs will be chosen and implemented should be added.

KEY WORDS: Marine Diseases; Pollution induced disease; Research Center.

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1.0 EXECUTIVE SUMMARY

The Marine Disease/Diagnostic Task Group of the Ecological Processes and Effects Committee of the Science Advisory Board met with personnel at the Gulf Breeze Environmental Research Laboratory (GBERL) on February 19 and 20, 1991 to review a proposal for establishing a National Center for Marine and Estuarine Disease Research. Ten specific questions were presented to the Task Group which dealt with technical program content, interactions with other agencies and scientists, facilities, budget, and personnel. Justification for the proposed center was based on scientific and public concerns that some human activities and byproducts are having detrimental impacts on aquatic resources in coastal regions of the United States. Valued populations of plants, invertebrates, fishes, turtles, seals, and dolphins have quantitatively and qualitatively declined from mass mortalities associated with infectious diseases. Except for the related efforts of the NOAA Status and Trends program, no specific centralized federal program provides the technical expertise to understand and appropriately address this environmental issue or to organize the myriad of federal and state programs that are addressing some aspects of these issues.

The intent of the proposal was to address several key issues: (1) To achieve a better understanding of diseases in coastal plants and animals; (2) Understand the influence of pollutants on disease and host-parasites; (3) Stimulate research on etiology, mechanisms of action, immunology, and cause-effects relationships; (4) Stabilize long term funding for research and provide a mechanism for exchange of technical information; and (5) Provide a central group to investigate and resolve marine disease issues. These goals were to be met in an intramural and extramural programs that together would grow from five persons and less than \$500 K in 1992 to 38 persons (including visiting scientists and postdoctoral students) and a budget of \$3600 K by 1997.

The Task Group was in unanimous agreement that there is a need for the EPA to fund a center related to diseases of marine and estuarine organisms. The general program goals were judged by the Task Group as appropriate for eventual inclusion in a comprehensive national program of the type being proposed. It was also concluded by the Task Group that the EPA GBERL was a logical site for such an EPA center as an extension of the existing pathobiology program and its associated expertise and facilities.

There was concern expressed by the Task Group, however, that in order for this marine and estuarine disease program

to achieve the desired results the proposal required extensive revisions. Consideration should be given to: 1) reducing the overly ambitious scope of the proposal, which was referred to by the Group, as "long on goals and short on substance" and "trying to be all things to all people"; and 2) presenting more informative details and plans on how each of the proposed programs will be chosen, implemented, and safeguarded from conflicts of interest.

2.0 INTRODUCTION

The U. S. Environmental Protection Agency has the responsibility and authority under several legislative acts (Marine Protection, Research and Sanctuaries Act, Federal Insecticide, Fungicide and Rodenticide Act, Toxic Substances Control Act, and Clean Water Act) to conduct the research necessary for support of regulations to assure the health status of flora and fauna in marine and estuarine ecosystems. Specific program responsibilities lie within the Office of Research and Development's (ORD) Office of Environmental Processes and Effects Research (OEPER). The Gulf Breeze Environmental Research Laboratory (GBERL) has had an on-going research program in marine pathobiology for many years. Personnel of the GBERL conducted a mail survey of experts in the field to determine what level of support existed for the establishment of a Center on marine organism diseases. These same experts were asked if a special conference on the subject would be useful. The results of the mail survey were generally positive on both questions and a conference was held in November of 1990, called the Gulf Breeze Symposium on Marine and Estuarine Diseases Research. Interest was also expressed by the conference participants for a establishing a center of expertise to address this critical environmental issue.

The need for such a Center also arises out of a general scientific concern and public awareness that some human activities and byproducts are having detrimental impacts on aquatic resources in coastal regions of the United States. Valued populations of plants, invertebrates, birds, fishes, turtles, seals, and dolphins have quantitatively and qualitatively declined from mass mortalities, reproductive impairment, and deformities due to toxic substances, indigenous or introduced infectious diseases, immune suppression, and cancer. While the basic ecological integrity of coastal aquatic ecosystems could be threatened by pollutant induced stresses. Only one specific centralized federal program, NOAA's Status and Trends Program, has the technical knowledge and expertise available to understand and appropriately address the full range of these environmental issues and it is inadequately

funded for the magnitude of the job. To rectify these shortcomings, a proposal was prepared and submitted by the GBERL for establishing "The National Center for Marine and Estuarine Diseases Research (CMED).

2.1 The Proposal

The stated goals of the proposed center were to: (1) Achieve a better understanding of diseases in coastal plants and animals; (2) Understand the influence of pollutants on disease, pathobiology, and host-parasite relationships; (3) Stimulate research on etiology, mechanisms of action, immunology, and cause-effects relationships; (4) Stabilize long term funding for research in EPA; (5) Provide a mechanism for exchange of technical information; and (6) Provide a central group to investigate and resolve marine disease problems. These goals were to be met by an intramural and extramural program that would grow from five persons and less than \$500 K in 1992 to 38 persons (including visiting scientists and postdoctoral) and a budget of \$3600 K by 1997.

2.2 Charge To The Science Advisory Board Task Group

The Task Group of the Ecological Processes and Effects Committee of the Science Advisory Board met with personnel at the Gulf Breeze Environmental Research Laboratory on February 19 and 20, 1991 to review the proposal for establishing a National Center for Marine and Estuarine Diseases Research. The charge to the Task Group consisted of ten specific questions. The questions were:

1. Is there a need for a National Center for Research on Diseases of Marine and Estuarine Organisms?
2. Is the U. S. Environmental Protection Agency's Gulf Breeze Environmental Research Laboratory an appropriate site for such a Center?
3. What other federal agencies should participate in the Centers's activities?
4. Do the GBERL plans fit appropriately into the larger framework of the National Ocean Pollution Plan and the EPA's National Coastal and Marine Policy?
5. How should state, university, and other non-federal agencies and institutions be related to the Center?
6. What should be the specific disease problems that require initial attention of the Center, from two

perspectives: 1) political or public policy; and 2) scientific?

7. What should the proper balance be between research activities and other activities of the Center?

8. Is the suggested balance between the current in-house activities and the extramural activities appropriate?

9. Is the plan for staff appropriate with respect to the mix of anticipated scientific disciplines and the time scale of hiring?

10. Is the budget appropriate in terms of its division between research and other activities and the mix of government and non-government research?

2.3 Task Group Review Procedures

The Task Group was provided with copies of the Gulf Breeze proposal prior to our meeting. A list of publications from the pathobiology program, and budget information was provided upon request at the meeting. During the meeting, the Task Group received oral briefings, toured the existing laboratory facility, and developed preliminary comments. Dr. Menzer, Director, Gulf Breeze Environmental Research Laboratory, requested that the Task Group provide him with a written response to the first two questions of the charge within a few weeks, so that the opinions of the Task Group could affect considerations for the next year's budget allocations. A copy of that response is included in Appendix A.

3.0 GENERAL COMMENTS ON PROPOSAL TO ESTABLISH CENTER

The Task Group was unanimous in its support for the establishment of a Center for Diseases in Marine and Estuarine Organisms. As increases in human populations occur in our coastal regions, concomitant increases in domestic, industrial, and agricultural pollutant stresses can be expected to adversely impact valued marine and estuarine species and their ecosystems. A Center of expertise that conducts research and coordinates information which is relevant to solving the anticipated or predicted diseases in marine organisms is a required adjunct to existing federal programs charged with protecting the environment. Because of the many agencies, institutions, and universities currently involved in several aspects of diseases in marine organisms, the Task Group recommended that EPA not to refer to it as a National Center. Instead,

they recommended that the proposed center be an EPA Center For Marine and Estuarine Diseases.

The Task Group raised several problems with respect to the content of the proposal. They found it to be very ambitious in scope and verbose in its listing of goals and attributes, but vague in language, and very terse on details of HOW goals were to be accomplished. In summary, the Task Group urged that the proposal be extensively revised before the full potential and benefits of a Center could be realized.

The Task Group deemed several programs in the proposal to be essential and of high priority. Specific recommendations included:

- 1) Research on anthropogenic caused diseases;
- 2) Crisis response, assessment, and correction;
- 3) Extension of the research through inter/intra-agency cooperation;
- 4) Inclusion of GBERL's expertise in ecotoxicology, microbiology, and analytical chemistry;
- 5) Training of young scientists through fellowships and graduate assistance.

Programs in the proposal that should be given a lower priority included:

- 1) Monitoring;
- 2) Standardization;
- 3) Certification.

Other important aspects of the program that the Task Group identified as important included:

- 1) Publication of results;
- 2) Programs should fit into EPA goals of reducing risks;
- 3) A balance in intramural and extramural programs;
- 4) A balance in research, crises assessment, and extension;
- 5) Training workshops at the center;
- 6) Teamwork among the staff within GBERL and with other EPA laboratories;
- 7) Establishment of a Scientific Advisory Group to guide program development;
- 8) Budgeting for personnel and facilities after identification of programs; and
- 9) A phased approach to implementing programs.

4.0 SPECIFIC COMMENTS ON QUESTIONS TO TASK GROUP

4.1 Need for a National Center

As discussed earlier, the Task Group agreed that there is a need for a Center related to diseases of marine and

estuarine organisms. However, it should not be titled a National Center. Instead a more appropriate title would be "EPA Center For Diseases Of Marine and Estuarine Organisms".

4.2 Center Location

The GBERL is a logical site for establishment of a Center for Diseases of Marine and Estuarine Organisms, because there is a productive history of pathobiology research at GBERL and this new proposal is a logical extension of that program. However, for such a Center to be established there is a substantial need for considerable enhancement of staff, facilities, and resources. The new program would be further enhanced by including other sections of the laboratory's expertise (ecotoxicology, microbiology, and analytical chemistry) in planning and implementing the disease programs. The Task Group recognized an obvious omission of these important disciplines. In light of the growth of GBERL program activities that would take place if the center were established, the Task Group also urges that other EPA laboratories (notably Narragansett and Duluth) to be involved in discussions concerning the implementation and planning of this center (See Recommendations).

4.3 Federal Agency Participants

All agencies that have existing programs or jurisdiction over others as well as those that support extramural research in diseases in marine organisms should be deemed as participants. The list of agencies is long but those considered prominent would include NOAA, DOI, USFWS, NIH, FDA, USDA, NSF, DOE, numerous state programs, and Departments of Army and Navy. Before the disease program becomes extensive in development, a serious attempt should be made to include many agencies that could be involved in the extramural programs. Such agencies should be consulted for their advice and to establish meaningful interactions. There is a great need for the EPA and all federal agencies to perform more efficiently in coordinating programs. The Task Group encourages the EPA personnel involved with planning this effort to work closely with other agencies. A total commitment should be made to cooperation between agencies.

4.4 Coordination with National Plans and Policy

The Task Group was given copies of the framework of the National Ocean Pollution Plan and the EPA's National Coastal and Marine Policy Prior to the review. The Task Group

believes that the proposed Center would fit into those frameworks.

4.5 Relationship to State, University, and Other Non-Federal Organizations

For the Center to fulfill its potential and to accomplish its objectives, it will be necessary to develop an effective network of collaborative activities with scientists in state, university, and other institutions. State agencies can, with proper guidance and training, play a critical role in crisis assessment. Universities can greatly assist in the basic research needs essential to understanding the diseases of marine and estuarine organisms. Universities have the infrastructure to assist in delivering the extension component of the proposed Center. Other institutions should be related to the Center's program by being involved in; (1) planning where appropriate, (2) sharing the extramural programs through research projects funded by the center, (3) establishing workshops and review meetings, and (4) publishing results.

Interdisciplinary activities can only be defined once the intramural activities have been adequately defined. It might be useful to utilize the advisory group approach to assist in assuring this extension function is adequately developed.

4.6 Identification of Priority Disease Problems

The proposal was quite weak in describing priority disease problems thus the review group was not able to identify precisely what was to be done at the center, except that it would address "high priority" issues. The Center requires an understanding of what the nation's needs are with respect to priority disease problems, and perhaps the advisory group could, once again, assist here. In addition, thorough literature search would also be valuable. The Center should not follow existing laboratory personnel's expertise and let them to proceed without caution. If retraining is necessary then this important component is essential.

The Task Group felt that the Center should focus its activities on defining interactions of anthropogenic stressors and diseases in economic, political, and ecologically important marine and estuarine organisms. The Center is strongly urged to initially addressing certain highly visible disease issues since it will improve the EPA's public credibility. Of primary importance is the selection of programs that must mesh with the mission of the EPA, preferably those which reduce risk.

4.7 Balancing Research With Other Center Activities

The proposed activities for the Center include research, crises assessment, information management and extension. These are all important components of an integrated plan for attacking the dearth of knowledge concerning diseases of marine and estuarine organisms. Where to place the emphasis must consider resources available and the strategy for implementation. Due to the historical activities of the Gulf Breeze ERL in research, it is important to continue a strong research capability. Extension activities which will seek to transfer the capabilities developed via research programs is an essential and an integral component of the Center. It is recommended that a 33:33:33 ratio be maintained between research, extension, and crises assessment. The Task Group found that the plans in the proposal to coordinate and set priorities among the manifold activities were weakly discussed at best.

4.8 Intramural and Extramural Research

The proposal needs to be revised to address in more detail the lines of research that would be undertaken with center funding by scientists inside and outside the EPA. It is agreed that an extramural research program is an extremely important part of the proposed Center. The proportion of internal and external research should probably be about 50:50. It will be necessary to define carefully an adequate mechanism by which funds will be used to support extramural research and especially how the allocation of extramural funds will be completely separated from the intramural program to eliminate any perception of a conflict of interest. The NIH has dealt with this problem for many years and their solution could be used as a model. It might be advisable to physically separate these two functions by having the extramural funds administered by the Narragansett EPA laboratory.

4.9 Staffing Mix and Hiring Schedule

The proposal establishes a mechanism for setting research priorities through an advisory committee. However, the proposed budget is very specific in identifying the kinds of expertise that will be sought in adding new staff. This implies that the priorities have already been decided. To correct this apparent inconsistency, additional information should be included in the proposal which outline and justify the necessary scientific disciplines and numbers of scientists required to staff the Center. The proposal should relate how existing personnel's capabilities fill part of this need. Plans for filling remaining voids in skills at the GBERL should be explained in the proposal.

Whether the deficiencies will be met by new hires, transfer of personnel from other branches, or collaboration with universities should be articulated. Evidence is needed to show that staffing requirements have been thoroughly evaluated.

There appears to be a discrepancy between the stated mission of the Center, that is to identify the interactions of anthropogenic stressors and diseases in marine and estuarine organisms, and the kinds of expertise to be hired based on the proposed budget. All the new positions proposed are in the fields of pathobiology or closely related disciplines. This reflects the historical research interests of the proponents of the center. However, to accomplish the mission of the Center there is a requirement for an interdisciplinary team of pathobiologists, environmental chemists, and ecologists. The proposed budget needs to better justify the reasons for not including these disciplines in the staffing plan or it should be modified.

4.10 Budget and Resource Allocation

This question was somewhat difficult to answer due to lack of clear specificity that was presented for the proposed activities, i.e., research and staffing mix. However, the budget appears to be reasonable if the scope of the proposed Center is focused in a manner consistent with these recommendations of the Task Group. As the proposal is currently written, it outlines rather sweeping goals and objectives. Neither the goals nor the objectives can be accomplished using the proposed budget and time frame as outlined. More thought and development is required.

5.0 SUMMARY OF RECOMMENDATIONS

Specific issues and programs were identified by the Task Group as important and worth emphasis:

- (1) Eliminate "national" from the title and refer to it as the "EPA Center For Marine And Estuarine Diseases";
- (2) Identify and develop the Center's research projects clearly within the context and operational framework of the EPA's Reducing Risk Program as formulated by the Science Advisory Board;
- (3) Focus on areas of research related to anthropogenic stresses which cause diseases in both economically and ecologically important species;

(4) Develop the vitally needed crisis response investigation capability;

(5) Integrate the environmental toxicity/disease programs from the Narragansett and Duluth EPA laboratories, other federal and state agencies, and universities, into this new GBERL program;

(6) Develop an extramural program, with strong safeguards against conflicts of interest, that involves other institutions and professionals in planning, conducting research, participating in workshops, and publishing results, in a manner that enhances the in-house program;

(7) Include the ecotoxicology, microbiology, immunology, and analytical chemistry capabilities and expertise now existing at the Gulf Breeze Laboratory within the new marine disease program; this recommendation appeared to be a major omission;

(8) The proposal requires a more detailed description of the relationship between existing GBERL staff and facilities and the programs to be initiated over time as related to new budget considerations for facilities, equipment, and personnel. The Task Group did not recommend a high priority be given to the proposed monitoring, standardization, and certification programs because of high demands on available resources.

Although the proposal addressed most of the above subjects, the Task Group found it difficult to provide a concise review of the proposal. The main problem was related primarily to an insufficient amount of detail, focus, and clarity in several portions of the document. The Task Group felt it was the responsibility of the authors to formulate sufficient details so that a comprehensive review could be performed in the future. The Task Group believes that implementation of a program that seriously considers the concerns expressed in this review will increase the probability of establishing the new Center that will realize these important goals.