

**BOARD OF SCIENTIFIC COUNSELORS (BOSC)
OFFICE OF RESEARCH AND DEVELOPMENT (ORD)
UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY (EPA)**

**PROGRAM REVIEW OF THE
NATIONAL CENTER FOR ENVIRONMENTAL
ASSESSMENT (NCEA)**

**Final Report of the Ad Hoc Subcommittee
on the Review of NCEA**

April 30, 1998

NOTICE

This report has been written as part of the activities of the Board of Scientific Counselors (BOSC), a public advisory group that provides objective and independent counsel to the Assistant Administrator for the Office of Research and Development (ORD) of the Environmental Protection Agency (EPA). The Board is structured to provide a balanced expert assessment of the management and operation of ORD's research programs and its utilization of peer review. This report has not been reviewed for approval by the Agency; and hence, the contents of this report do not necessarily represent the views and policies of the EPA or other agencies in the federal government. Mention of trade names or commercial products does not constitute a recommendation for use.

TABLE OF CONTENTS

Preface	3
Roster Board of Scientific Counselors Executive Committee	4
Roster Board of Scientific Counselors NCEA <i>Ad Hoc</i> Subcommittee	5
1.0 Executive Summary	7
2.0 Laboratory Review	9
2.1 Alignment of Priorities and Directions With the ORD Strategic Plan	9
2.2 Laboratory Strategic Initiative	10
2.3 Integration Across and Within Divisions and Within ORD	11
2.4 Measures of Performance and Awards	12
2.5 Organizational Performance Compared With Others	12
2.6 Interactions With the Outside Scientific Community	13
2.7 Unique Capabilities and Their Use	14
2.8 Appropriate Mix of Workforce, Facilities, and Infrastructure	15
3.0 Recommendations	17
4.0 Appendices	
A. Letters From Board of Scientific Counselors Chair	
B. Self-Study Report	
Farland, William H., National Center for Environmental Assessment	
C. Meeting Agenda	
D. NCEA Organization Chart	

PREFACE

The Board of Scientific Counselors (BOSC) provides objective and independent counsel to the Assistant Administrator of the Office of Research and Development (AA/ORD) on the management and operation of ORD's research programs. The primary functions of BOSC are to: (1) evaluate science and engineering research programs, laboratories, and research-management practices of ORD and recommend actions to improve their quality and/or strengthen their relevance to the mission of the EPA; and (2) evaluate and provide advice concerning the use of peer review within ORD to sustain and enhance the quality of science in EPA.

In fall 1996, Dr. Robert J. Huggett, AA/ORD, requested that BOSC conduct peer reviews of the ORD Laboratories and Centers. Accordingly, BOSC undertook the task of conducting programmatic, as opposed to scientific or technology, reviews of the Laboratories and Centers and proceeded to establish policies and procedures for conducting such reviews. The scheduled reviews occurred as follows:

- ❖ National Exposure Research Laboratory, July 21-22, 1997, at Research Triangle Park, NC
- ❖ National Health and Environmental Effects Research Laboratory, August 4-5, 1997, at Research Triangle Park, NC
- ❖ National Risk Management Research Laboratory, August 18-19, 1997, at Cincinnati, OH
- ❖ National Center for Environmental Assessment, September 8-9, 1997, at Washington, DC
- ❖ National Center for Environmental Research and Quality Assurance, October 20-21, 1997, at Washington, DC

As constructed, the Laboratory and Center reviews are expected to lead to a better understanding of the strategies employed by the respective Directors in accomplishing their missions, and to a better understanding as to how these strategies are implemented. BOSC also expects to develop a clearer perspective on how effective these strategies are in causing the operation of the Laboratories and Centers to come into alignment with the strategic plan of the ORD.

Each Laboratory and Center review consisted of two parts. The first part was a written self-study submitted to the review committee in advance of the date of its review, and the second part was a 2-day site visit conducted by the review committee. In the self-study, Directors were asked to prepare responses to eight questions aimed at a programmatic assessment of the organization. During the first day of the site visit, the Director made a brief presentation about the organization and was then asked to respond to questions from the review committee about the self-study document. Later, case studies were presented that reflected how the organization successfully addressed a specific issue faced by the Agency. The first day concluded with breakout sessions attended by staff scientists and other professionals. On the second day, the committee drafted a report that contained its findings and recommendations. At the end of the day, an exit interview was conducted with the Director.

All review teams were organized as *Ad Hoc* Subcommittees of the Board of Scientific Counselors and were headed by a chair and vice chair, both members of BOSC. Additional members of the Subcommittee were selected on the basis of an appropriate technical discipline as well as having broad experience in science and research management, planning, and communication. The Chair of BOSC attended all reviews as an ex-officio member.

BOARD OF SCIENTIFIC COUNSELORS EXECUTIVE COMMITTEE

Chair:

Costel D. Denson, Ph.D., Vice Provost for Research, University of Delaware, Newark, DE

Members:

Marilyn A. Brown, Ph.D., Deputy Director, Energy Efficiency and Renewable Energy Program, Oak Ridge National Laboratory, Oak Ridge, TN

Thomas A. Burke, Ph.D., Co-Director, Risk Sciences and Public Policy Institute, School of Hygiene and Public Health, The Johns Hopkins University, Baltimore, MD

James S. Bus, Ph.D., Technical Director, Health and Environmental Sciences, The Dow Chemical Co., Midland, MI

William E. Cooper, Ph.D., Professor, Institute for Environmental Toxicology, Michigan State University, East Lansing, MI

Robert W. Howarth, Ph.D., David R. Atkinson Professor of Ecology and Environmental Biology, Cornell University, Ithaca, NY

Michael C. Kavanaugh, Ph.D., Malcolm Pirnie, Inc., Oakland, CA

Brian P. Leaderer, Ph.D., Professor of Epidemiology, Yale University, The John B. Pierce Laboratory, Inc., New Haven, CT

Raymond C. Loehr, Ph.D., Professor of Civil Engineering, Environmental and Water Resources, Engineering Program, Civil Engineering Department, The University of Texas at Austin, Austin, TX

William R. Pierson, Ph.D., Research Professor, Energy and Environmental Engineering Center, Desert Research Institute, Reno, NV

Jerald L. Schnoor, Ph.D., Professor of Civil and Environmental Engineering, University of Iowa, College of Civil and Environmental Engineering, Iowa City, IA

Mitchell J. Small, Ph.D., Professor, Civil and Environmental Engineering, Department of Civil and Environmental Engineering, Carnegie-Mellon University, Pittsburgh, PA

Rae Zimmerman, Ph.D., Professor of Planning and Public Administration, Robert F. Wagner Graduate School of Public Service, New York University, New York, NY

Committee Staff:

Shirley Hamilton, Designated Federal Official, National Center for Environmental Research and Quality Assurance, U.S. EPA, Washington, DC

BOARD OF SCIENTIFIC COUNSELORS
NCEA *AD HOC* SUBCOMMITTEE

BOSC Members:

- Chair: James S. Bus, Ph.D.
Technical Director
Health and Environmental Sciences
The Dow Chemical Co.
Midland, MI
- Vice Chair: Robert W. Howarth, Ph.D.
David R. Atkinson Professor of Ecology and Environmental Biology
Cornell University
Ithaca, NY
- Members: Carol J. Henry, Ph.D.
Director
Health and Environmental Sciences Department
American Petroleum Institute
Washington, DC
- Ronald J. Kendall, Ph.D.
Professor and Director
Institute of Environmental and Human Health
Texas Technical University
Texas Tech University Health Services Center
Lubbock, TX
- Raymond C. Loehr, Ph.D.
Professor of Civil Engineering
Environmental and Water Resources, Engineering Program,
Civil Engineering Department
The University of Texas at Austin
Austin, TX
- Dennis Pastenbach, Ph.D.
McLaren-Hart, ChemRisk, Inc.
Woodside, CA
- Ex-Officio: Costel D. Denson, Ph.D.
Vice Provost for Research
University of Delaware
Newark, DE

BOSC DFO: Shirley Hamilton
Designated Federal Official
National Center for Environmental Research and Quality Assurance
U.S. EPA/ORD
Washington, DC

Laboratory Director: William H. Farland
Director
National Center for Environmental Assessment
U.S. EPA/ORD
Washington, DC

Logistical DFO: Linda Tuxen
Special Assistant to the Director
National Center for Environmental Assessment
U.S. EPA/ORD
Washington, DC

Technical Liaison: Edward Bender
Office of Science Policy
U.S. EPA/ORD
Washington, DC

1.0 EXECUTIVE SUMMARY

The Program Review Subcommittee on the National Center for Environmental Assessment (hereinafter referred to as the “Subcommittee”) of the Board of Scientific Counselors (BOSC) met on September 8-9, 1997, to review the program and mission of the National Center for Environmental Assessment (NCEA). As part of the review, the staff and management of NCEA prepared a “Self-Study Report,” which included responses to eight questions developed by the BOSC as a basis to evaluate and later compare each of the five national research Centers and Laboratories of the Office of Research and Development (ORD). During the meeting, the Subcommittee discussed the Self-Study Report responses with NCEA management and staff and gathered additional comments from the staff regarding the organization, management, human resources, and their professional relationships within the Agency and with external users of NCEA products. The conclusions and recommendations that follow are based on the input from the meeting, the Self-Study Report, and the experience of the Subcommittee.

The NCEA vision is to become recognized within ORD and the Agency as “The Risk Assessment People.” Although this vision appears to be bold, it will likely provide significant value to ORD if attained. The Subcommittee offers several recommendations that, if implemented, may promote NCEA as an effective Center supporting the accomplishment of the ORD Strategic Plan.

NCEA must develop its own strategic plan that provides both focus and balance in support of the ORD Strategic Plan. Of particular importance is the recognition that NCEA is currently under-resourced to support ecological risk assessments, and that at present too much of NCEA’s efforts are directed to “crises,” or short-term projects. Given that NCEA is a relatively small resource within ORD, it must develop a plan that reflects its ability to function as an expertise Center, serving ORD and other EPA Offices primarily by acting as a catalyst for generation of scientifically credible risk assessments. It must develop an operational paradigm that permits it to evolve as a leader for excellent science and service across the spectrum of its Agency clients, and not as a primary “doer” of standard risk assessments.

To accomplish its mission, NCEA must develop improved mechanisms not only for communicating its vision to Center staff, but also to work aggressively at establishing better relationships with its key ORD and Agency clients. Improvements in these relationships will lead to continued refinements in a focused and balanced strategy for delivering value-added products to ORD. An additional key element to NCEA’s overall strategy must be the recognition that NCEA support of the risk assessment process mandates that it leverage many internal and external scientific expertise centers. Consequently, NCEA must seek creative opportunities to engage academic, industrial, governmental, EPA, and other ORD science arms to fully foster development and accomplishment of its programs. Finally, NCEA must develop internal programs that identify and train staff to effectively carry out its unique mission requirements.

2.0 LABORATORY REVIEW

NCEA developed a Self-Study Report, which included a response to eight questions posed by the BOSC and a presentation of three case studies. The Subcommittee's conclusions and recommendations included in the comments below, reflect the perspectives of the Subcommittee members after direct dialog with NCEA leadership and staff around commentary provided by the Self-Study Report. **The Subcommittee recommendations are provided in bold type.**

It is important to note that the recommendations contained herein are intended to provide suggested directions, that if implemented, may enhance the ability of NCEA to achieve its strategic transition of being recognized within ORD and the Agency as "The Risk Assessment People." During the course of the review, the Subcommittee observed many positive attributes and strengths within the NCEA organization. However, these attributes are not specifically emphasized in this report because the scope of this review was entirely focused on development of recommendations to further the refinement of NCEA's organizational effectiveness.

2.1 Alignment of Priorities and Directions With the ORD Strategic Plan

NCEA describes its role as both central and critical within ORD, and perhaps the Agency, as a conduit for the gathering and dissemination of information and comments on the risk assessment process. NCEA views its primary mission responsibilities to the Agency as: (1) developing methodologies to reduce uncertainties in current approaches to risk assessments; (2) conducting assessments of contaminants and sites of national significance; and (3) providing guidance and support to Agency risk assessors. Integral to this mission is NCEA's intent to coordinate research planning and conduct as it relates to construction of scientifically defensible risk assessments. NCEA's vision is to be known within the Agency as "The Risk Assessment People," emphasizing their expertise and knowledge of the risk assessment process and science, not just the production of documents.

The functions and core capabilities of NCEA are intended to support several principles from the ORD Strategic Plan as well as the achievement of five of the six long-term goals from the ORD Strategic Plan. Only the goal to provide common sense and cost-effective approaches for preventing and managing risks is not currently part of the core capability and strength of NCEA; however, planning is under way to strengthen this area.

The Subcommittee discussed the vision of NCEA as "The Risk Assessment People" with management and staff during the review. Several members questioned whether NCEA viewed itself as a Center of performing risk assessments for the Agency, or as a Center of expertise for development and application of refined and/or novel approaches that enhance the scientific credibility of EPA-conducted risk assessments. NCEA management indicated a desire to perform both roles. However, when the Subcommittee discussed their assignments and roles with staff, this vision of NCEA (particularly that of being a recognized expertise Center for ORD) was unclear.

The Subcommittee recognizes that the reorganization of both ORD and NCEA is still a work in progress, so the current lack of full appreciation among the staff of the NCEA mission and vision is understandable. However, the Subcommittee believes that **NCEA management must take steps to clarify and communicate its vision within NCEA, ORD, and the Agency. The Subcommittee recommends that NCEA continue to identify and communicate the following to Program**

Offices and ORD: (1) the changes that are occurring within NCEA; (2) the performance and value of NCEA; and (3) the positive actions and directions being taken by NCEA to align with and implement the ORD Strategic Plan. Only by so doing will NCEA have the opportunity to achieve the desired state of being recognized as a key provider of leadership, guidance, and support for the development of Agency risk assessments.

One of ORD's nine strategic principles is to "balance human health and ecological research." The NCEA Self-Study Report recognizes a continuing imbalance in their activities, with ecological research being under-represented. Although NCEA leadership indicated that the balance between ecological and human health research approximated roughly 30:70, further discussions indicated that the ecological component may be more under-represented than the leadership estimate. Of the 12 specific research directions described by NCEA in the Self-Study Report, only two involve ecology: "Water Quality Assessment" (which involves both health and ecology) and "Ecological Risk Assessment." In both of these areas, the ecological focus is fairly vague and general. Nonetheless, the review applauds NCEA for recognizing the need to build strengths in the ecological areas.

2.2 Laboratory Strategic Initiative

NCEA supports a wide variety of research initiatives and other projects intended to achieve the long-term goals of the ORD Strategic Plan. At present, many of these efforts appear to be directed to high-profile issues, "fire-fighting" crises, and "problem-oriented" issues. To deal with these complex and challenging issues in an orchestrated manner, **the Subcommittee recommends that NCEA develop a strategic plan outlining an approach that brings both focus and balance to support of its core research capabilities and abilities to address ORD Strategic Plan elements.** The Subcommittee further recommends including an explicit plan for redressing the imbalance between human health and ecology by strengthening the infrastructure for ecological research. The strategic plan should include mechanisms for achieving project focus and balance, resource allocation, staff and leadership development for current and future needs, client orientation and service philosophy, communication of NCEA's value, and staff recruitment and retention.

The Subcommittee believes that **to facilitate its efforts at focus, NCEA should consult the advice and suggestions from previous Agency Science Advisory Boards, National Research Council (NRC) reports, and separate reviews of ORD (e.g., Reducing Risk, Safeguarding the Future, Beyond the Horizon).** These documents provide examples and direction for approaching: (1) risk assessment as a strategy for decisions; (2) retrospective analyses; (3) methods for better acquisition of information from external groups; (4) better communication of successes; and (5) emphasis on ecological issues.

Discussions with NCEA staff indicated some degree of uncertainty as to how much of the strategic vision, mission, and EPA commitments currently embraced and under development by the Center Director are well understood/communicated down into the ranks. Thus, **the Subcommittee recommends that NCEA leadership develop additional efforts and mechanisms to improve communication of the NCEA strategic thinking and initiatives to the staff.**

2.3 Integration Across and Within Divisions and Within ORD

NCEA needs to strengthen its ties to Agency programs and as a center of risk assessment advice, guidance, and development of methods and guidelines. Many of the strategic initiatives presented in the Self-Study Report represent the “problem-oriented” approach to addressing ORD strategic needs. Although it is recognized that these issues must be addressed, **the Subcommittee recommends that NCEA also develop strategic initiatives that are crosscutting through these issue areas.** Such initiatives should facilitate definition of NCEA strategic efforts to address critical crosscutting objectives such as: (1) developing scientifically sound approaches on how to conduct risk assessments for carcinogens, systemic toxicants, and ecosystems; (2) ensuring that the Agency adequately maintains and refines the IRIS database, a critical service to the Agency and the Nation; (3) assisting Agency clients with implementation and training in use of “state-of-the-art” risk assessment guidelines; and (4) enhancing Agency recognition that noncontaminant insults represent a significant driving force for ecological risk assessments. Such noncontaminant insults include eutrophication from excess inputs of nutrients, the effects of climate change, and the effects from the biological agents such as toxic algal blooms (e.g., see NRC 1993 Managing Wastewater in Coastal Urban Areas). The review team believes that NCEA’s leadership of the EPA Risk Assessment Forum should prove to be a productive vehicle for integrating risk assessment science across the Agency.

Examination of the NCEA resources indicates they represent roughly 10 percent of both the ORD budget and Full-Time Equivalents (FTEs), and that this level of support is unlikely to change in the years ahead. As noted in the NCEA Self-Study Report, if the NCEA is to realize its vision of being recognized as “The Risk Assessment People,” it must undertake creative and aggressive steps that allow it to serve and be recognized as the catalyst in assisting its Agency clients in the implementation of both routine and novel scientifically defensible risk assessments. With its limited resources, NCEA will be ineffectual if viewed and depended upon as the primary “doer” of Agency assessments. For NCEA to be successful as a cross-functional service and research organization, it must fully understand its clients’ needs and priorities, and then correspondingly align the Center’s strategic program. **The Subcommittee recommends that NCEA place a greater emphasis on understanding the expectations of its Agency clients, including those at the Assistant Administrator level, and then work to ensure that NCEA initiatives are in place to fulfill those needs. To ensure that NCEA is successfully satisfying its various clients, a comprehensive client-based evaluation of both NCEA program support and its Director’s leadership should be initiated.** The feedback evaluation must be designed to provide NCEA with clear understanding as to whether NCEA guidance, leadership, and program activities are both needed and productive for its clients.

The Subcommittee believes that research into new and refined approaches to development of risk assessments is and should be an essential element of the program offered by NCEA. However, the review team observes that to “test” new hypotheses and approaches to risk assessment, significant portions of these research efforts will require the involvement of Laboratory-based research teams in other parts of ORD and the Agency. To accomplish these objectives, therefore, **the Subcommittee recommends that NCEA develop and cultivate improved relationships with key Laboratory-based partners within ORD and the Agency.** Interviews with staff during this review indicate that at the present time NCEA does not have the necessary access and influence to alter the priorities of EPA Laboratory-based research in a manner that supports NCEA objectives.

2.4 Measures of Performance and Awards

As a compliment to the high quality and productivity of its scientific expertise, the staff of NCEA has received a number of high-level EPA recognition awards for its contributions to the Agency mission. However, given the changing mission of the newly reorganized ORD and NCEA, many of the projects that have received awards in the past may not be consistent with the current mission and priorities of NCEA. **To reinforce the directions of any newly developed strategic plan, NCEA should develop personnel incentives and recognition programs that align with its strategic priorities.** For example, a key element of NCEA strategy is to develop scientifically sound methods for the conduct of risk assessments. Incentives linked to achieving this end might include travel incentives to participate in scientific forums/meetings dealing with state-of-the-art science relevant to risk assessment, provision of a post-doctoral trainee(s) to further expand a staff member's scientific inquiries, or awards for the conduct of NCEA-driven collaborative research projects with an ORD/Agency Laboratory. If exemplary work is performed in an area that is outside of the NCEA priorities, NCEA management may, of course, recommend it for an Agency-wide award. However, given the limited human resources of NCEA and the pressing need to support a broadly based Agency clientele, the Subcommittee believes that NCEA should limit its awards to projects that support its priorities.

The Subcommittee notes that NCEA has established an award category unique within the Agency, the "ALCEA Peer Award," which is intended to bestow honor and official recognition for individual or team achievements. The recipients of this award are selected by their peers, not managers. The development of this award appears to be a good idea that could be expanded to other areas of the Agency. In view of the earlier Subcommittee recommendation for improved communication of NCEA strategy to the staff, the awarded selections may provide NCEA leadership with continuing perspectives of the staff assimilation of NCEA strategic initiatives and goals.

In addition to incentives intended to motivate high-quality activities, NCEA also must develop incentives that promote productivity targets for projects that encompass considerations of effort, cost, and completed deliverables. **The Subcommittee recommends that NCEA set a goal to reach closure for all projects it initiates within preplanned time projections.** All projects should end with clearly delineated deliverables, and where appropriate, should be subjected to feedback review from internal NCEA staff and external NCEA clients. Such 360 degree review both within and outside the Agency will provide insights of the project's strengths and weaknesses. The Subcommittee also believes that **NCEA should develop an improved process to track cost and effort investment for project conduct so that management can better visualize which activities are consuming resources (and then compare these analyses to priorities of the core mission).** The review team believes that an improved understanding of time investments (on at least a per person per week basis) will provide a transparent process to tie budget to performance.

2.5 Organizational Performance Compared With Others

Comparison of entire organizations to determine the quality of performance and function is often difficult. Certainly there are other organizations with somewhat similar functions to NCEA within the federal government (e.g., the National Institute for Occupational Safety and Health or the Food and Drug Administration). A recognized difficulty in such comparisons is that organizations have only recently started to benchmark in a routine way, and so comparative data and analyses are often not available, even when organizations perform similar functions. However, there are func-

tions that can be compared or benchmarked against other organizations and internally within an organization. For example, the process of initiating, selecting, awarding, monitoring, and managing contracts occupies a major multistep effort of many research organizations within the federal government and in nongovernment organizations. The contracting process also is amenable to internal benchmarking, where the various steps can be examined and efficiencies or alternatives can be identified. Common measures that can be benchmarked are the length of time for award from time of concept; length of time for initiation of work from time of award; length of time from approval of contract modifications; and number of staff needed to review/initiate contract process.

Other functions that could be considered for benchmarking also are administrative in nature—length of time for completion of documents to final; cost (including federal staff time) of preparing and finalizing documents; time and iterative process steps necessary for effective reviews of staff documents; and response time to client inquiries. A particular approach for these exercises is to identify those processes that may be serving as bottlenecks to NCEA productivity and quality concerns, and through the use of benchmarking analyses, unplug the bottlenecking processes.

The Subcommittee recommends that NCEA identify criteria, after appropriate client consultations, that would represent stakeholder-supported benchmarks for improving NCEA productivity, quality, and client service objectives. NCEA should then apply these criteria to a focused benchmarking exercise.

2.6 Interactions With the Outside Scientific Community

The Self-Study Report highlighted staff outreach activities to the external scientific community. These activities include publication of manuscripts, sponsorship of scientific seminars and workshops, development of collaborative relationships with local universities or scientific institutions, and interactions with international scientific bodies. The intent of much of these activities appears to be to take the scientific messages of NCEA to external scientific forums. Although such efforts are to be commended, it is not clear how these activities fully promote and benefit (i.e., encourage information/science transfer—it could be called “mining” for science/information) NCEA, ORD, and EPA. **The Subcommittee recommends that NCEA implement specific strategic plans and efforts to acquire (“mine”) and integrate such information to the benefit of EPA.**

During the discussions with NCEA management and staff, interactions were described for the three geographically disparate NCEA offices (Washington, Cincinnati, and Research Triangle Park), with local academic institutions, which included adjunct academic appointments, participation in seminar series, and establishment of part-time research appointments. In addition, the rationale for relocating the Washington office near a local university and outside of the EPA Headquarters facility was described as necessary to improve contacts with the scientific community and to indicate the strong association NCEA has with research and academic organizations. Although these activities are noteworthy, **the Review Team highly recommends that NCEA use the best expertise and scientific organizations that can be found for scientific collaborations, without undue reliance on location.** Local arrangements can become “comfortable,” and without the forcing function of competition among researchers, researchers may lose the cutting-edge expertise so necessary for research excellence.

Disproportionate reliance on local expertise centers may particularly compromise NCEA responsibilities to the ecological areas. Although some centers of ecological excellence exist in academic institutions near the Research Triangle Park, NC, site of NCEA, much of the Nation's strength in ecological assessment lies in academic and other scientific institutions physically distant from NCEA offices. NCEA also needs to identify and interact with governmental ecological expertise centers external to NCEA, including Corvallis and Narragansett (EPA), the National Oceanic and Atmospheric Administration (NOAA), the U.S. Geological Survey (USGS), and the National Center for Atmospheric Research (NCAR).

One of ORD's nine strategic principles is to "take advantage of the creativity of the Nation's best research institutions so that sound science will be used to support EPA policies and decisions." As noted above, the Subcommittee believes NCEA is not now fully exploiting these opportunities. Although NCEA is taking steps to interact with institutions close to their physical locations, no apparent plan exists to identify the premier institutions with expertise in health and ecological risk analysis. Strengthened interactions between NCEA and these institutions are essential for adding creative energy to current and future NCEA programs, and also to help the proactive identification of emerging issues of national concern. Such interactions, because of the network they provide, also could help in the potential recruitment of high-quality new staff. Given these considerations, **the Subcommittee recommends that NCEA: (1) identify opportunities for interaction with national academic Centers of Excellence that are funded by ORD; (2) develop processes to strengthen interactions with academic researchers through mechanisms such as competitive grants, contracts, and CRADAs (Cooperative Research and Development Agreements); and (3) create an external advisory group to help NCEA identify external opportunities to interact with the "Nation's best research institutions."**

The Subcommittee believes that an overriding criterion for successful interactions of NCEA staff with the outside scientific community is the scientific stature of the NCEA staff themselves. Incentives for staff excellence, as recognized by peers in the broad scientific community, are to be encouraged. Membership in professional scientific societies should be supported as well as attendance at annual meetings of scientific societies where opportunities are presented to establish, cultivate, and maintain important science networking contacts.

2.7 Unique Capabilities and Their Use

Although it is clear that the staff of NCEA has been expanded as a result of the ORD reorganization, it is unclear to the Subcommittee how that talent has been restructured to uniquely support the Center's goals. Also, it appears to the Subcommittee that at the present time, and likely for the future, the conduct of risk assessments is not the unique province of NCEA (e.g., other EPA Offices, such as Pesticides, and Regional Offices also conduct extensive analyses). Given the likely continuation of this situation, NCEA must be challenged to develop a unique and value-added focus to support critical ORD and Agency responsibilities.

The Subcommittee believes that such focus lies in NCEA's capability and expertise to develop, acquire, test, and maintain state-of-the-art methods and information that support the environmental and human health risk assessment needs for the Agency and its stakeholders. In this context, the review team agrees with the NCEA Self-Study Report that there is indeed a need for a "big picture" risk assessment organization within ORD, as long as that organization realizes that its value will most likely come from serving as a positive catalyst to ORD and the Agency for the conduct of

scientifically sound risk assessments, and not as a centralized owner and controller of all Agency risk-oriented activities. For NCEA to realize its “big-picture” vision, significant efforts will have to be expended from leadership to create a firm buy-in from the NCEA staff and its many clients. A particularly important element of this strategic transition will be to redirect staff activities from “crises-oriented” special projects (which currently appear to consume significant portions of staff resources, and interviews with staff suggest that such activities constitute their primary mission) to focused scientific endeavors that truly promote improvements in the scientific underpinnings of Agency risk assessments.

What is critical to implementing this vision is the development of a strategic plan that is appropriately focused on necessary areas of excellence within NCEA. NCEA should not attempt to be great in everything, and it is the Subcommittee’s opinion that with a more strategically focused vision and assessment of future talent needs, in terms of personnel, NCEA will go much farther in really making a difference in contributing to the implementation of the mission of ORD within the Agency.

As part of further identifying NCEA’s unique capabilities, it is **the Subcommittee’s recommendation that the Center Director consult with his clients, particularly at the Assistant Administrator level within EPA, to identify their needs and how NCEA may address them.** As NCEA’s strategic plan is unfolded, it will become clearer as to the needs of the clients involved and what personnel and/or other resources will be needed to address those needs through NCEA.

2.8 Appropriate Mix of Workforce, Facilities, and Infrastructure

As noted in Section 2.1, **the Subcommittee strongly recommends that NCEA develop a clear plan to improve the balance between ecological and human health risk assessment, including the resources, staff, and expertise that NCEA will provide.** At present, only 4 percent of NCEA staff identify their disciplinary training as being in ecology. Assuming that noncontaminant ecological insults will represent an increasing concern in environmental risk assessments, NCEA must strategically plan for this change. To facilitate this transition, **NCEA should consider establishment of an outside advisory group to help develop a strategic plan for approaching ecological risk assessments.**

NCEA also should consider how additional talent and expertise will be obtained or enlisted, particularly for support of potentially critical areas, such as the Risk Assessment Forum, and work groups associated with the Integrated Risk Information System (IRIS).

Subcommittee discussions of the Self-Study Report with NCEA leadership and staff revealed several human resource issues that will require increased attention by NCEA leadership. First, if NCEA is to have lasting value to the Agency, **the Subcommittee recommends that a long-term leadership development plan/process be developed for the Director and Associate and Assistant Center Directors.** Such a process would be of value not only for guiding selection of new hires, but also should direct focused planning for broadened job assignments and promotions for future leaders. A succession plan also should define opportunities for expanded staff empowerment, thereby fostering an environment for future leaders to emerge. Second, the Self-Study Report indicates that significant changes in priorities and directions lie ahead at NCEA, changes that likely will call for application of skill sets currently weak or not present within NCEA. To effectively deal with these strategic changes, **the Subcommittee recommends that NCEA**

implement a mentoring and skills enhancement program. This program should be designed to ensure not only that appropriate new skills are acquired, but also to insure that existing skills critical to NCEA's mission are efficiently passed on among the staff and leadership.

NCEA is planning to relocate outside EPA Headquarters early next year. While this relocation is consistent with the desire to switch the Center from the operating mode of a firefighter doing risk assessment to a leader in the development of scientific methods for risk assessment, the Subcommittee was nonetheless concerned whether this change in location would be "sending the right signal" to potential customers of NCEA. The Subcommittee believes that NCEA should pay close attention to client expectations surrounding this separation from Headquarters, and NCEA must be sensitive to the possibility that future NCEA success may be tied to how well it is being perceived as being "close to the customer."

Resource allocation and personnel recruitment, retention, and development all need consideration as part of the strategic planning process that NCEA should implement. The positions should be consistent with those of the ORD Strategic Plan. It is obvious that NCEA needs to establish dynamic opportunities to infuse new ideas, scientists, and other joint-venture opportunities, as appropriate and as needed with the evolving environmental issues that it will be dealing with in the future. Of course, infrastructure issues, such as staff professional development, travel, and establishment and management of contracts, present challenges, which with appropriate planning and resource allocation, should be dealt with in an appropriate manner.

3.0 RECOMMENDATIONS

The recommendations described below are direct and sequential transcriptions of the bolded statements in Sections 2.1 through 2.8. Background information, observations, and conclusions supporting these recommendations are found in the appropriate text Section. Based on the review conducted of NCEA, the BOSC *Ad Hoc* Subcommittee recommends that NCEA:

1. Continue to identify and communicate the following to Program Offices and ORD: (1) the changes that are occurring within NCEA; (2) the performance and value of NCEA; and (3) the positive actions and directions being taken by NCEA to align with and implement the ORD Strategic Plan.
2. Develop a strategic plan that outlines an approach that brings both focus and balance to support of its core research capabilities and abilities to address ORD Strategic Plan elements, including an explicit plan for redressing the imbalance between human health and ecology by strengthening the infrastructure for ecological research.
3. Consult the advice and suggestions from previous Agency Science Advisory Boards, NRC reports, and separate reviews of ORD (e.g., Reducing Risk, Safeguarding the Future, Beyond the Horizon).
4. Develop additional efforts and mechanisms to improve communication of the NCEA strategic thinking and initiatives to the staff.
5. Develop strategic initiatives that are crosscutting through Agency and ORD priority issue areas.
6. Place a greater emphasis on understanding the expectations of its Agency clients, including those at the Assistant Administrator level, and then work to ensure that NCEA initiatives are in place to fulfill those needs. To ensure that NCEA is successfully satisfying its various clients, a comprehensive client-based evaluation of both NCEA program support and its Director's leadership should be initiated.
7. Develop and cultivate improved relationships with key Laboratory-based partners within ORD and the Agency.
8. Develop personnel incentives and recognition programs that align with its strategic priorities.
9. Set a goal to reach closure for all projects NCEA initiates within preplanned time projections.
10. Develop an improved process to track cost and effort investment for project conduct so that management can better visualize which activities are consuming resources.
11. Identify criteria, after appropriate client consultations, that would represent stakeholder-supported benchmarks for improving NCEA productivity, quality, and client service objectives. NCEA should then apply these criteria to a focused benchmarking exercise.
12. Implement specific strategic plans and efforts to acquire ("mine") and integrate priority information to the benefit of NCEA, ORD, and EPA.

13. Use the best expertise and scientific organizations that can be found for scientific collaborations, without undue reliance on location.
14. Identify opportunities for interaction with national academic Centers of Excellence that are funded by ORD; develop processes to strengthen interactions with academic researchers through mechanisms such as competitive grants, contracts, and CRADAs; and create an external advisory group to help NCEA identify external opportunities to interact with the “Nation’s best research institutions.”
15. Develop a clear plan to improve the balance between ecological and human health risk assessment, including the resources, staff, and expertise.
16. Establish an outside advisory group to help develop a strategic plan for approaching ecological risk assessments.
17. Develop and implement a long-term leadership development plan/process for the Director and Associate and Assistant Center Directors.
18. Implement a mentoring and skills enhancement program for NCEA staff.

4.0 APPENDICES

A. Letters From Board of Scientific Counselors Chair

B. Self-Study Report

Farland, William H., National Center for Environmental Assessment
September 8-9, 1997

C. Meeting Agenda

United States Environmental Protection Agency
Office of Research and Development
Board of Scientific Counselors

REVIEW OF THE NATIONAL CENTER FOR ENVIRONMENTAL ASSESSMENT

September 8-9, 1997

Holiday Inn Arlington at Ballston
Wilson/Glebe Room
4610 North Fairfax Drive
Arlington, Virginia

PROPOSED SITE VISIT AGENDA

Monday, September 8, 1997

8:00 a.m. - 8:15 a.m.	Welcome and Introduction	Center Director
8:15 a.m. - 8:30 a.m.	Opening Remarks	Review Team Chair
8:30 a.m. - 9:15 a.m.	Overview of NCEA	Center Director
9:15 a.m. - 9:45 a.m.	Review and Discussion of NCEA Self-Study	Review Team/ Center Director
9:45 a.m. - 10:00 a.m.	BREAK	
10:00 a.m. - 12:00 noon	Review and Discussion of NCEA Self-Study	Review Team/ Center Director
12:00 noon - 1:00 p.m.	LUNCH	
1:00 p.m. - 1:30 p.m.	Dioxin Case Study	Center Staff
1:30 p.m. - 2:00 p.m.	Particulate Matter Case Study	Center Staff
2:00 p.m. - 2:30 p.m.	Drinking Water Exposure Case Study	Center Staff
2:30 p.m. - 2:45 p.m.	Public Comment	
2:45 p.m. - 3:00 p.m.	BREAK	
3:00 p.m. - 5:00 p.m.	Breakout Sessions	Review Team/ Center Staff
5:00 p.m. - 5:15 p.m.	Wrap-Up and Adjourn	

Tuesday, September 9, 1997

8:00 a.m. - 9:00 a.m.	Discussion and Writing Session	Review Team
9:00 a.m. - 10:00 a.m.	Meet with NCEA Director for Additional Information (IF NEEDED)	Review Team
10:00 a.m. - 12:00 noon	Writing Session	Review Team
12:00 noon - 1:00 p.m.	LUNCH	
1:00 p.m. - 3:00 p.m.	Debriefing and Wrap-Up	Review Team
3:00 p.m.	Adjourn	

D. NCEA Organization Chart