



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

OFFICE OF
RESEARCH AND DEVELOPMENT

October 16, 2006

Dr. James H. Johnson, Jr.
Chair, Board of Scientific Counselors
Dean, College of Engineering,
Architecture and Computer Sciences
Howard University
2366 6th Street, NW, Room 100
Washington, DC 20059

Dear Dr. Johnson:

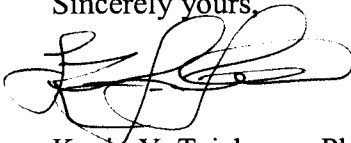
On January 25–27 of this year, Dr. Herb Windom chaired the Water Quality Subcommittee of the Board of Scientific Counselors' (BOSC) evaluation of the Office of Research and Development's (ORD) Water Quality Research Program in Cincinnati, OH. Following that review, the Subcommittee presented a report of its findings and recommendations about program relevance, quality, performance and scientific leadership to the Executive Committee of the Board of Scientific Counselors. After receiving a copy of the final report, the Water Quality Research Program generated a response to the BOSC report (enclosed).

The enclosed narrative identifies specific recommendations made by the reviewers, provides a brief comment in response, and indicates how the Water Quality Research Program will incorporate the committee's findings into its operation. Also attached is a table summarizing each recommendation, the action to be taken, and a schedule for completion of the action. The Program benefited considerably from your insight and advice and your recommendations were greatly appreciated.

As indicated in the Charge for the Water Quality Research Program, ORD intends to conduct periodic evaluations of its Program's progress at intervals of four to five years. The purpose of these reviews determines progress with regard to relevance, quality, performance, and scientific leadership; identifies when clients are applying research to strengthen environmental decisions; and evaluates client feedback about the research. In

addition to a formal review every four to five years, ORD intends to conduct an interim evaluation of the Program's progress midway through the review cycle. At a point which will occur approximately within the next two years, a subset of the Water Quality Research Program subcommittee will be invited to participate in a one-day review to evaluate the status of the changes the Program has agreed to implement. In this context, we look forward to the possibility of working with you again.

Sincerely yours,



Kevin
Teichman

Kevin Y. Teichman, Ph.D.

Acting Deputy Assistant Administrator for Science

Enclosure

cc: Dr. Herb Windom
Dr. Gary Saylor
Dr. Christian Chauret
Dr. Laura Ehlers
Dr. Kevin Kleinow
Dr. Judith Meyer
Dr. Stephen Weisberg



Office of Research and Development's (ORD) October 2006 Response
to the Board of Scientific Counselors (BOSC) July 2006 Final Report
that Reviews ORD's Water Quality Research Program

BOSC Water Quality Subcommittee:

Dr. Herb Windom, Chair
Dr. Gary Saylor, Vice Chair
Dr. Christian Chauret
Dr. Laura Ehlers
Dr. Kevin Kleinow
Dr. Judith Meyer
Dr. Stephen Weisberg

Submitted by:

Charles Noss, Sc.D.
National Program Director
Water Quality Research Program

ORD Response to the Board of Scientific Counselors (BOSC) Review of the Water Quality Research Program (WQRP)

A Water Quality Subcommittee of the BOSC conducted a review of ORD's water quality research program in 2005/2006. As part of the review, the subcommittee conducted conference calls on December 7 and 16, 2005, and January 12, 2006, and held a face-to-face meeting in Cincinnati, Ohio on January 25–27, 2006. The draft subcommittee report was reviewed by the BOSC Executive Committee at their March 2006 meeting, and the final BOSC report was transmitted to ORD in July 2006.

The following is a narrative response to the recommendations provided by the BOSC review of ORD's WQRP. Program responses to six Summary Recommendations are presented. The BOSC recommendations are listed in italics following its reference number relative to the appropriate charge. The ORD response follows each BOSC recommendation.

BOSC Summary Recommendations

Summary Recommendation 1: *A more transparent approach to prioritizing research is recommended. This should be provided in the next MYP.*

Response SR1:

The MYP is currently being revised. The processes for collecting information and transparently making decisions are being revised and will be documented in the revised MYP. In particular, we are focusing on clarifying the links between the regulatory drivers and the research, identifying criteria for what research will be done, and clarifying the critical paths that lead from APMs to APGs to LTGs.

Summary Recommendation 2: *An annual accounting of Program outcomes is needed that includes the following six metrics: research activities completed by a specified date; results published in papers, reports, or otherwise made available; transfer and communication of report results; institutional outcomes; management outcomes; and environmental outcomes.*

Response SR2:

The completion of APMs by a specified date will continue to be monitored as required by GPRA. The number of publications per FTE has been accepted by OMB as the basis for an efficiency measure of the Water Quality program; therefore, all publications will be recorded and evaluated. As part of the MYP revision process, new accountability measures are being identified for institutional and environmental outcomes. One of the possibilities being explored is the tracking of APMs and establishing a measure of regional use as an environmental outcome.

Summary Recommendation 3: *The exploratory part of the Science to Achieve Results (STAR) Program should be reinstated and made sustainable. This is necessary to keep the WQRP fresh and flexible to confront emerging issues.*

Response SR3:

The Program supports this recommendation and has encouraged the continued funding of the extramural grants program. We expect to continue to plan for anticipatory research, in part, by funding annual open-ended STAR solicitations.

Summary Recommendation 4: *The Program should include partnering and collaboration particularly with the States.*

Response SR4:

We agree with the BOSC recommendation, and the NPD has reiterated the BOSC's message in presentations to the Lab and Center personnel. The Program has striven to collaborate with others as opportunities have arisen. To expand on past successes, MYP workgroups (consisting of representative from ORD, OW offices, and Regions) are actively seeking new opportunities and avenues for collaboration by identifying State and/or Regional individuals who can help create local contributions to national efforts on a subject-by-subject basis.

Summary Recommendation 5: *The MYP needs considerable improvement if it is to better communicate the goals of the Program as it is intended. It needs to communicate where the Program has been, where it is now, and where it is going.*

Response SR5:

The Program accepts this challenge, and is committed to providing greater background information and context, along with a description of future research directions, in its revised MYP.

Summary Recommendation 6: *Biosolids should not be elevated to a Long-term Goal (LTG). This research should be subsumed either in LTG 3 or under the same structure as other pollutant sources in the frameworks for LTGs 1, 2, and 3.*

Response SR6:

The Program has rewritten its LTGs to be consistent with the BOSC's recommendations. Biosolids research has been incorporated into the structure of the three existing LTGs. The LTGs were reworded to be consistent with outcomes and measures of use.

BOSC Specific Recommendations

I. Charge: Program Relevance

Recommendation R1: *The MYP should include a strategy for evaluating each of the criteria and tools it develops in multiple eco-regions, based on findings from the ecosystem classification research.*

Response R1:

The Program recognizes the relevancy of conducting work in various eco-regions. Therefore, greater Regional representation has been included on the Research Coordination Team (RCT), on the various MYP workgroups, and workgroup teams that are being developed. It is

anticipated that these efforts will identify new research collaborations, and also will help to achieve the goal of conducting demonstrations of ORD-developed tools in multiple eco-regions.

Recommendation R2: *The MYP should develop a better system for tracking progress on LTGs by developing a clearer linkage between Annual Performance Measures (APMs), Annual Performance Goals (APGs) and LTGs.*

Response R2:

The BOSC guidance has been helpful in the Program's development of an OMB-accepted annual performance measure. However, this is a first step toward developing a system for more broadly tracking progress from completing APMs to APGs and LTGs. We plan to continue to work toward this objective to demonstrate program relevance and progress toward our goals.

Recommendation R3: *The Program should strive to maintain its core competency in water quality research.*

Exploratory research should be encouraged more and made to be a sustainable part of the STAR Program.

Response R3:

The Program concurs with the BOSC recommendation to maintain its core competency. The NPD will work with the ORD Labs and Centers to meet both scientific and management objectives.

The Program has supported the STAR program, and expects to continue its support.

II. Charge: Program Quality

Recommendation Q1: *The Program should establish more systematic use of external reviews for RFAs. A better link to the grant program Web pages from EPA's main page is recommended.*

Response Q1:

EPA is mindful of the importance in soliciting input from external experts. We are committed to developing a more integrated approach to developing RFAs and evaluating program performance. Currently, our grant management process includes the use of external experts at several stages. This approach incorporates steps for soliciting input from the scientific community in setting priorities among the various options for research areas; identifying programmatic needs and priorities from clients and other potential users when identifying specific RFA topics; and developing expected outputs, outcomes, and performance metrics for the research supported by STAR.

This is done through various means, including the use of standing or *ad hoc* expert panels, workshops, scientific meetings, and review publications prepared by experts in the field. These review publications or "synthesis documents" can either be those published in peer reviewed literature or ones commissioned by EPA to assist in the development of a specific RFA.

Finally, EPA is establishing a standing BOSC committee for the purpose of reviewing materials at NCER's request on an as-needed basis, which we envision will include RFAs.

The EPA home page has a direct link to information on grants at EPA, including the STAR program. In addition, the ORD home page has a direct link to the ORD grants page. NCER's Web manager will work to get a direct link to the ORD grants page posted on the EPA home page.

Recommendation Q2: *A combination of external and internal peer review of Program products should continue to be used.*

Collaboration with other agencies in the review of Program products should be encouraged whenever appropriate to ensure their quality.

Response Q2:

EPA has an established Peer Review policy that is described in detail in our Peer Review Handbook. We will continue to follow the requirements of this policy and, as necessary, collaborate with other agencies in the review of our products.

III. Charge: Program Performance

Recommendation P1: *Biosolids should not be elevated to an LTG. This research should be subsumed under the same structure as other pollutant sources as in the frameworks for LTG 1, 2, and 3 or included in LTG 3.*

Program design should articulate more clearly the proactive aspects of the WQRP.

Response P1:

As stated under SR6, the Program has rewritten its LTGs to be consistent with the BOSC's recommendations. Biosolids research has been incorporated into the structure of the three existing LTGs. The LTGs were reworded to be consistent with outcomes and measures of use.

By addressing the BOSC's recommendations to better articulate what the program has achieved, what it is doing, and where it is going; it is expected that the next MYP will more clearly articulate what we hope to achieve and why it is important.

Recommendation P2: *Prioritization based on impact, sensitivity, and uncertainty should be continued, but national versus regional significance, scaling according to anticipated completion of projects, and the relationship between existing and emerging topics also should be taken into account.*

Specific questions addressed in the prioritization process should be stated more clearly.

A more transparent history or research progression should be provided in planning documents to allow for ongoing management overview and prioritization.

Response P2:

The Program is seeking to address the BOSC's concerns about prioritization and transparency of processes at all levels. First, the Program has developed criteria for ranking research within the MYP workgroups. These criteria deal with the issues of science, impact, sensitivity, and uncertainty. We have also developed criteria for ranking across the workgroups at the RCT level. These criteria align more with OMB investment criteria and PART-related measures, including topics of regional or national scale or new concerns. The processes, and responsibilities for their completion (from workgroups to ORD and OW management), will be presented in the next MYP. All documents are being electronically stored until it is determined what tracking capabilities are needed, relative to all of ORD's research programs including the WQRP.

Recommendation P3: *Clearly articulate the linkage between research from the Program (i.e., LTG) level down to and among individual projects.*

Response P3:

As the workgroups develop science questions and research descriptions that will result in the creation of APGs and APMs, this information will be used by the NPD to develop more descriptive linkages. We are committed to developing a better process for research tracking that includes the BOSC recommendation to create better linkage between LTGs and projects.

Recommendation P4: *Program plans should indicate where a line of inquiry has been, where it is now, and where it is going to better determine if the research is sequenced appropriately and relevant to current and future needs.*

Response P4:

We concur with the BOSC recommendation and will work toward this objective in the revision of the MYP.

Recommendation P5: *Mechanisms of communication and input at multiple levels are applauded. The BOSC encourages this and recommends that the Program institutionalize a more systematic approach to communicating with clients.*

Response P5:

At the beginning of the 2006 MYP revision process, the Program reinvigorated the RCT (consisting of ORD, OW and Regional representatives) through MYP revision kick-off workshops and by generating new RCT member expectations. The NPD has met with the OW Office Directors to discuss the institutionalization of regular ORD/OW management meetings, including annual face-to-face and regular electronic communications to support the RCT functions. These processes are being instituted as part of the MYP revision (and documented therein), and are expected to continue during the annual budget exercises. Meetings and other communications will be scheduled in accordance with the program and management needs during these activities. We are continuing to explore other mechanisms for improving communication.

Recommendation P6: *Additional prioritization criteria that are recommended include: national versus regional or local significance, return in terms of products and outcomes and versus investment, relation to prior research, and anticipated impact.*

Response P6:

The MYP is currently being revised. The processes for collecting information and transparently making decisions are being revised, and will be documented in the revised MYP. In particular we are focusing on clarifying the links between the regulatory drivers and the research, identifying criteria for what research will be done, and clarifying the critical paths that lead from APMs to APGs to LTGs.

The completion of APMs by a specified date will continue to be monitored as required by GPRA. The number of publications per FTE has been accepted by OMB as the basis for an efficiency measure of the Water Quality program. Therefore, all publications will be recorded and evaluated. As part of the MYP revision process, new accountability measures are being identified for institutional and environmental outcomes. One possibility being explored is to track APMs and establish a measure of regional use as an environmental outcome.

The Program is seeking to address the BOSC's concerns about prioritization and transparency of processes at all levels. First, the Program has developed criteria for ranking research within the MYP workgroups. These criteria deal with the issues of science, impact, sensitivity, and uncertainty. We have also developed criteria for ranking across the workgroups at the RCT level. These criteria align more closely with OMB investment criteria and PART-related measures, including topics of regional or national scale or new concerns. The processes, and responsibilities for their completion (from workgroups to ORD and OW management), will be presented in the next MYP. All documents are being electronically stored until it is determined what tracking capabilities are needed, relative to all of ORD's research programs including the WQRP.

IV. Charge: Program Progress

Recommendation PG1: *The WQRP should do a more thorough annual accounting of APMs to track progress under each LTG.*

Response PG1:

As the workgroups develop science questions and research descriptions that will result in the creation of APGs and APMs, this information will be used by the NPD to develop more descriptive linkages. We are committed to developing a better process for research tracking that includes the BOSC recommendation to create better linkage between LTGs and projects.

V. Charge: Scientific Leadership

Recommendation SL1: *The Program should continue to diversify its research competence to address emerging regulatory issues while maintaining research in support of regulatory mandates.*

Response SL1:

We agree that it is important to maintain a balance to support existing client programs and yet look to future needs. The MYP seeks to define those needs, and ORD Labs and Centers use this information to help achieve that balance. Also, please refer to Response R3.

VI. Charge: Coordination and Communication

Recommendation CC1: *Implementation of incentives that inspire a culture motivated toward collaboration is recommended. In particular, an increase in partnership projects is encouraged with state/local government, as these agencies typically are the ultimate users of ORD products.*

Response CC1:

We agree with the BOSC recommendation, and the NPD has reiterated the BOSC's message in presentations to the Lab and Center personnel. The Program has striven to collaborate with others as opportunities have arisen. To expand on past successes, MYP workgroups (consisting of representatives from ORD, OW offices, and Regions) are actively seeking new opportunities and avenues for collaboration by identifying State and/or Regional individuals who can help create local contributions to national efforts on a subject-by-subject basis.

Recommendation CC2: *The Program should institute mechanisms for achieving better technology and information transfer between the STAR Program and the ORD laboratories.*

Response CC2:

EPA uses a variety of tools for disseminating outputs from research supported by the STAR program, including (but not limited to): 1) our Web site; 2) annual and final reports from grantees; 3) one-page summaries about specific grants or groups of grants; 4) synthesis documents; 5) brochures; and 6) e-mails to relevant mailing lists.

Most of these approaches rely on the skills and experience of NCER Project Officers to integrate information obtained from their routine project-level monitoring and review with the programmatic-level needs of the Agency, and we are constantly searching for ways to continue to improve this process. Improved development of products that integrate research results across ORD will allow NCER to better evaluate the impact of its research on specific areas of science and regulatory programs.

Specific to the EcoHAB (WQ) Program, EPA has developed a brochure highlighting the progress made by some of our grantees, which is being used to inform ORD, specific clients and the public at large.

Finally, a "tool-kit" is in the planning stages for the EcoHAB grants. It will be a document that lists the specific product from the grant, a description of the tool/method/result, actual (if known) or potential outcomes and uses, and a list of those stakeholders currently using (or who could potentially use) the product. This will then be used to populate larger databases, such as the Environmental Science Connector—a virtual research and collaboration center providing access to environmental science data, decision-support tools, and other scientific information.

Recommendation CC3: *The MYP should describe a sense of Program continuity: where the program has been, where it is and where it is going.*

Response CC3:

At the beginning of the 2006 MYP revision process, the Program reinvigorated the RCT (consisting of ORD, OW and Regional representatives) through MYP revision kick-off workshops and by generating new RCT member expectations. The NPD has met with the OW Office Directors to discuss the institutionalization of regular ORD/OW management meetings, including annual face-to-face and regular electronic communications to support the RCT functions. These processes are being instituted as part of the MYP revision (and documented therein), and are expected to continue during the annual budget exercises. Meetings and other communications will be scheduled in accordance with program and management needs associated with these activities. We are continuing to explore other mechanisms for improving communication. The Program is committed to providing greater background information and context along with its description of future research directions in its revised MYP.

Recommendation CC4: *The Program should encourage its scientists to aim for the higher tier journals, as excessive publication in lower tier journals creates a poor perception about the research quality.*

Response CC4:

This information will be communicated to the Lab and Center Directors and management to develop an action plan. With the acceptance of publications per FTE as a PART efficiency measure, quality controls and measures will need to be established and monitored. These activities should create a positive result by focusing management's attention to the number and quality of publications. Another PART measure is the percentage of publications rated as "highly cited." By aiming for higher tier journals, we will also aid our efforts to meet the targets for improving this measure.

Recommendation CC5: *The Program should develop a systematic set of activities or incentives and metrics of success that encourages and tracks the establishment of relationships with users that lead to better technology transfer.*

Response CC5:

We agree, and in conjunction with the other NPDs and Programs, will seek to develop metrics that can be used not only in the WQRP, but for other ORD activities as well.

Recommendation CC6: *The Program should use the new procedure it has instituted for meeting with organizations, such as the Association of State and Interstate Water pollution Control Administrators (ASIWPCA), for enhancing interaction with other stakeholder groups.*

Response CC6:

The NPD will encourage ORD Labs and Centers to partner with extramural agencies and NGOs when these collaborations add value to the WQRP's research.

Water Quality Research Program

Summary of BOSC Recommendations from July 2006 Final Report and Proposed ORD Actions and Timelines

(The table below includes entries only for those recommendations that require ORD action.)

Recommendation	ORD Action	Timeline for Action
<p>SR1: <i>A more transparent approach to prioritizing research is recommended. This should be provided in the next MYP.</i></p> <p>P2: <i>Prioritization based on impact, sensitivity, and uncertainty should be continued, but national versus regional significance, scaling according to anticipated completion of projects, and the relationship between existing and emerging topics also should be taken into account.</i></p> <p>P6: <i>Additional prioritization criteria that are recommended include: national versus regional or local significance, return in terms of products and outcomes and versus investment, relation to prior research, and anticipated impact.</i></p>	<p>Establish specific criteria for prioritizing research and use these in developing a revised MYP.</p>	<p>Criteria: by November 15, 2006 MYP: by April 30, 2007</p>
<p>SR2: <i>An annual accounting of Program outcomes is needed that includes the following six metrics: research activities completed by a specified date; results published in papers, reports, or otherwise made available; transfer and communication of report results; institutional outcomes; management outcomes; and environmental outcomes.</i></p> <p>PG1: <i>The WQRP should do a more thorough annual accounting of APMs to track progress under each LTG.</i></p>	<ol style="list-style-type: none"> 1) Track research outputs and publications to meet PART measures. 2) Identify an accountability measure for PART 	<ol style="list-style-type: none"> 1) Beginning with the 2007 PART cycle. 2) By December 2007

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Recommendation	ORD Action	Timeline for Action
<p>SR4: <i>The Program should include partnering and collaboration particularly with the States.</i></p> <p>CC1: <i>Implementation of incentives that inspire a culture motivated toward collaboration is recommended. In particular, an increase in partnership projects is encouraged with state/local government, as these agencies typically are the ultimate users of ORD products.</i></p> <p>CC6: <i>The Program should use the new procedure it has instituted for meeting with organizations, such as the Association of State and Interstate Water Pollution Control Administrators (ASIWPCA), for enhancing interaction with other stakeholder groups.</i></p>	<p>1) Identify Regional representatives to assist in identifying opportunities for collaboration with States</p> <p>2) Actively seek new opportunities and avenues for collaboration by identifying State and/or Regional individuals who can help create local contributions to national efforts. Encourage Labs and Centers to partner with other agencies.</p>	<p>1) Done</p> <p>2) Ongoing; NPD will report on new collaboration opportunities at the mid-cycle review</p>
<p>SR5: <i>The MYP needs considerable improvement if it is to better communicate the goals of the Program as it is intended. It needs to communicate where the Program has been, where it is now, and where it is going.</i></p> <p>P4: <i>Program plans should indicate where a line of inquiry has been, where it is now, and where it is going to better determine if the research is sequenced appropriately and relevant to current and future needs.</i></p> <p>CC3: <i>The MYP should describe a sense of Program continuity: where the program has been, where it is and where it is going.</i></p>	<p>Revise the MYP with an emphasis on providing greater background context and descriptions of future research.</p>	<p>ORD expects to complete a revision of the MYP by April 30, 2007.</p>
<p>SR6: <i>Biosolids should not be elevated to a Long-term Goal (LTG).</i></p> <p>P1: <i>Biosolids should not be elevated to an LTG.</i></p>	<p>Revise the LTGs to incorporate biosolids into the other LTGs.</p>	<p>Done</p>

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Recommendation	ORD Action	Timeline for Action
R1: <i>The MYP should include a strategy for evaluating each of the criteria and tools it develops in multiple ecoregions, based on findings from the ecosystem classification research.</i>	Include greater Regional representation on the RCT	Done
R2: <i>The MYP should develop a better system for tracking progress on LTGs by developing a clearer linkage between Annual Performance Measures (APMs), Annual Performance Goals (APGs) and LTGs.</i> P3: <i>Clearly articulate the linkage between research from the Program (i.e., LTG) level down to and among individual projects.</i>	Revise the MYP to provide clearer linkages between LTGs, APGs, and APMs	ORD expects to complete a revision of the MYP by April 30, 2007
Q1: <i>The Program should establish more systematic use of external reviews for RFAs. A better link to the grant program Web pages from EPA's main page is recommended.</i>	Work to get a direct link to the ORD grants page posted on the EPA home page	By December 2006
P5: <i>The BOSC recommends that the Program institutionalize a more systematic approach to communicating with clients.</i>	1) Re-establish the RCT 2) Institute regular meetings with OW	1) Done 2) By December 2006
CC2: <i>The Program should institute mechanisms for achieving better technology and information transfer between the STAR Program and the ORD laboratories.</i>	1) Develop a brochure highlighting progress on EcoHAB 2) Develop a tool-kit for EcoHAB grants	1) Done 2) By December 2007
CC4: <i>The Program should encourage its scientists to aim for the higher tier journals, as excessive publication in lower tier journals creates a poor perception about the research quality.</i>	Track number of publications/FTE. Use bibliometric analysis to track and improve percentage of "highly cited" publications.	Beginning with 2007 PART cycle

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Recommendation	ORD Action	Timeline for Action
<i>CC5: The Program should develop a systematic set of activities or incentives and metrics of success that encourages and tracks the establishment of relationships with users that lead to better technology transfer.</i>	Work with other programs to develop metrics	NPD will report on progress at the mid-cycle review