



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

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THE ADMINISTRATOR

EPA-SAB-09-006

Dr. Deborah L. Swackhamer, Chair
Dr. M. Granger Morgan, Immediate Past Chair
Science Advisory Board
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

Dear Drs. Swackhamer and Morgan:

Thank you for your letter of November 26, 2008, and for the report titled "EPA Strategic Research Directions 2008: An Advisory by the EPA Science Advisory Board."

At my confirmation hearing and in my communications with U.S. Environmental Protection Agency staff, I have emphasized that science must be the backbone of EPA programs. Sound decision-making under our public health and environmental laws depends on rigorous adherence to the best available science. To identify and interpret this science, I will rely on the expert judgment of EPA career scientists, backstopped by strong peer review processes and the guidance of independent, highly qualified scientific advisors.

For 30 years, the Science Advisory Board has provided essential scientific and technical advice to the Agency. Its role is critical in ensuring the objectivity and transparency of our scientific endeavors, and I intend to rely heavily on the SAB to safeguard the integrity and quality of our science-based decisions.

An important component of EPA's success as a science-based agency is the research we perform. The SAB plays an essential role in helping EPA assess the overall direction of our research programs. Your recommendations are particularly timely as EPA's new leadership, working with career staff in the Office of Research and Development, takes a new look at both the environmental problems ORD works on and how the office can best contribute to solving them. ORD's goals are to both solve problems of broad, national significance that cut across multiple EPA program and regional offices (e.g. climate change) and to provide the more targeted research required to meet the needs of EPA's regulatory programs. ORD is committed to accomplishing both goals by drawing on its unique ability to conduct integrated, multidisciplinary research and by working with its partners within the Agency from "end to end," i.e. from problem definition through assessing outcomes. Harmonizing these goals is an ongoing challenge as EPA seeks to deploy its finite resources as beneficially as possible.

I understand that ORD recently provided the SAB with an overview of its transformation effort. We will continue to engage the SAB on the details of ORD's new research approach as Agency discussions progress.

The SAB's eight recommendations for changes in EPA's research programs provided in your cover letter are extremely helpful. We have reviewed these recommendations carefully and believe that in many areas we are already working toward the change in focus recommended by the SAB. Our more detailed response is enclosed, in which we provide examples of EPA actions that are consistent with the SAB recommendations. At the same time, we recognize that more action will be needed to fully address the environmental challenges we face. Taking new action requires choices and trade-offs; we plan to engage the SAB as we navigate this more challenging part of the decision-making process.

The SAB also provided comments on research effectiveness and efficiency, communications with the SAB, and specific research areas. We are still completing our review of these additional recommendations and will respond very shortly in a separate letter.

Again, thank you for your letter and the advisory report. The SAB's recommendations lay out an ambitious agenda for ORD's research program. I share the Board's interest in ensuring that ORD's efforts are directed toward meeting our nation's most important environmental challenges in an integrated, multidisciplinary way that draws on ORD's unique expertise. Therefore, your recommendations will be given full consideration as ORD plans its research program.

I look forward to working closely with you to strengthen science and science-based decisions, both within ORD and across the Agency.

Sincerely,



Lisa P. Jackson

Enclosure

Enclosure

The following comments refer to the eight overall recommendations provided in your cover letter of November 26, 2008.

1) *Broaden the interpretation of "land preservation" to take a greater leadership role in future land-use decision-making and in managing the consequences of biofuels, sprawl, green-field development, and the pressures of unconstrained coastal development.*

EPA agrees with the Board's broader interpretation of land preservation. Coordinated research in ecosystem services, land, water, global change, and sustainability is enabling EPA to manage the consequences of not only biofuels production but also sprawl, green-field development, and coastal development. It is also enabling EPA to understand the incentive structures associated with land-use decisions.

ORD's Land Research Program has partnered with ORD's Science and Technology for Sustainability Program to address land-use issues concerning biofuels. Moreover, ORD's Ecosystem Services Research Program's Future Midwestern Landscapes Study is using scenario analysis to examine the effects of biofuels policy on a suite of six ecosystem services: air quality, clean drinking water, reduced flood risk, rural economic opportunity, rural aesthetics, and outdoor recreation opportunities. Both the biofuels scenarios and the ecosystem service endpoints were developed by ORD scientists in collaboration with regional, state, and local stakeholders within the 12-state study area.

The Land Research Program is helping EPA take leadership on land-use issues through brownfields redevelopment and materials re-use. At the same time, land-restoration issues such as asbestos, vapor intrusion into homes, and contaminated sediment continue to be important research areas for EPA regions and states. The Land Research Program is evaluating methods to enhance technology evaluation and transfer to accelerate restoration efforts in these areas. Meanwhile, the Human Health Risk Assessment Program is building off of health research in the Land Research Program, among other ORD programs, to develop health-assessment values of important substances such as Libby amphibole asbestos for risk-based clean-up determinations.

2) *Expand the focus on the environmental consequences of new technologies to include a broader consideration of the life-cycle of new products and their globalization.*

EPA agrees that understanding the life-cycle of new products, their globalization, and the associated environmental and human health implications is an important research area. We are using life-cycle analysis to study the global consequences of new technologies such as nanotechnology and biofuels. EPA is also conducting research to better understand how the international transport of pollutants impacts the ability of the United States to meet environmental standards. These efforts are jointly supported by ORD and its partners in EPA's program and regional offices, other federal agencies, academia, and international bodies such as the United Nations Environment Program.

3) *Expand the analysis of water infrastructures, supply, demand, and quality in light of changing socio-economic pressures and climate.*

EPA concurs with this important recommendation. The Agency is taking action on several fronts to meet the research challenges of water infrastructure, supply, and demand. Our Water Quality and Drinking Water Research Programs, in addition to supporting regulatory mandates, are shifting to a sustainable water quality and quantity approach, which includes integrated research on options to improve the management of water resources. Our Ecosystem Services Research Program complements these efforts by helping to evaluate the ecosystem-service outcomes and trade-offs implicit in water-policy decisions at the watershed and regional scales. Moreover, EPA is supporting the Aging Water Infrastructure initiative, a research program to reduce the cost and improve the effectiveness of efforts to maintain, operate, and, where necessary, replace aging drinking-water and wastewater treatment and conveyance systems. An important component of this effort is focused on adaptation to the effects of climate change. Projects such as these are reflective of ORD's increasingly integrated approach to water research.

4) *Reinvigorate and modernize research on sensitive human and ecological populations including research involving chemical mixtures.*

EPA agrees with the SAB that this is also a critical area of research, and given rapid scientific advances, EPA needs to continue to be a leader in this field. EPA's research programs in human health, human health risk assessment, chemical contaminants, endocrine disrupting chemicals, safe pesticides and products, computational toxicology, and ecosystem services all include projects designed to address susceptible populations – both human and ecological. Our research is designed to inform the application of uncertainty factors to protect children and other sensitive populations, the development of better tests and protocols to evaluate risk, and the development of methods to assess the cumulative risk of chemical mixtures that reflect real-world exposures to be incorporated into human health risk assessments (e.g. IRIS and integrated science assessments). We are exploring how to move to a more integrated, multidisciplinary approach that addresses all of these issues related to chemical contaminants, including aggregate exposures and cumulative risk (mixtures).

5) *Improve the science foundation needed to respond to unexpected and emerging problems and environmental disasters.*

EPA agrees that we must continue to improve the scientific foundation needed to respond to unexpected and emerging problems and environmental disasters. Creative mechanisms, including partnerships, enable the Agency to obtain the information it needs to make decisions about emerging risks. For example, ORD has co-funded, with the National Science Foundation, the Center for the Environmental Implications of Nanotechnology, with which ORD will collaborate in the conduct of nanotechnology research. Additionally, ORD and the Office of Prevention, Pesticides, and Toxic Substances are working together to implement EPA's Nanomaterial Stewardship Program. This allows EPA to utilize data submitted by industry to complement information generated in ORD and elsewhere and is useful for informing risk assessment and decision-making.

As another example, EPA has been working with six other federal agencies for several years under the auspices of the Office of Science and Technology Policy's National Science and Technology Council to develop an interagency research strategy on pharmaceuticals in the environment. The strategy identifies opportunities where the agencies can work collaboratively and will foster engagement with United States state and local governments, other countries, international organizations, key industrial sectors, non governmental organizations, and the public.

EPA also thanks the SAB for conducting its thoughtful, self-initiated work on environmental disasters. Our Homeland Security Research Program is reviewing this report and developing an approach to address the issues raised.

6) Expand policy-relevant research on developing, testing, and evaluating new and innovative alternatives to conventional command-and-control regulation.

EPA supports additional research on developing alternatives to traditional command-and-control regulatory approaches and believes that this line of research is closely aligned with the changing emphasis of our risk-management research program. We know that alternative approaches could improve the effectiveness of achieving positive environmental outcomes while simultaneously reducing the cost of compliance and litigation. Alternative approaches, depending on their design, could require additional monitoring and enforcement to ensure that environmental targets are being met. Economics plays an important role in framing alternative approaches, as EPA needs to analyze the costs and benefits of different risk-management options.

7) Improve dramatically the integration of economics and the decision and behavioral social sciences into research and policy development across the Agency.

EPA agrees with this recommendation, and we are seeking ways to integrate ecology with economics and the behavioral aspects of decision sciences. For example, the Ecosystem Services Research Program is partnering with EPA's National Center for Environmental Economics. The decision and behavioral sciences are currently under-represented as disciplines within EPA. EPA will work with organizations such as the National Science Foundation, which is supporting work in these research disciplines, to learn how to more effectively recruit and retain employees with these skills and also to establish programs that make the best use of the information and insights they offer.

In addition, in December 2008, the Ecosystem Services Research Program announced a National Ecosystem Services Research Partnership, which is designed to bring together experts and practitioners from the fields of business, law, finance, economics, decision sciences, sociology, and ecology. To date, we have received expressions of interest from the environmental and multidisciplinary academic communities, professional ecological organizations, state governments, counties, and municipalities, other federal agencies, non-governmental conservation organizations, industry, and the emerging private sector market for ecosystem services. The Ecosystem Services Research Program has also retained several national experts in the fields of economics and decision sciences to help the program define the ways in which

society benefits from the services provided by ecosystems and to advise the Program as it completes its research implementation plans for peer review.

8) *Continue to work on improving the effective communication of research results to potential users both inside and outside the Agency.*

EPA is committed to effectively communicating its research results, not only to potential users but also with internal and external research partners. Increasingly, we strive to engage key decision makers early in the research process to ensure that the results of our research provide them with the information and tools they need to solve environmental problems.

ORD employs a variety of approaches to communicate its research results to EPA's internal users. Our National Program Directors play critical roles in coordinating research across our labs and centers internally as well as communicating from end-to-end with ORD's external partners and stakeholders. Other approaches include routinely scheduled seminars for our program and regional offices during which our scientists present research results and discuss potential applications. ORD scientists serve on workgroups formed to develop Agency regulations and guidance. As workgroup members, they are able to apply their scientific expertise and directly transfer research results to Agency products.

Our scientists communicate results through established scientific channels, such as publication in the peer-reviewed literature and presentations at scientific and technical society meetings. ORD is also working to better communicate our research results to the public through an enhanced presence on the Agency's Web site (<http://www.epa.gov/ord>), as well as through other media channels.

In addition, ORD is exploring new external research partnerships. For example, ORD's Ecosystem Services Research Program recently teamed up with the National Geographic Society and World Resources Institute to map ecosystem services and develop enhanced decision-making tools. Researchers are creating maps that display these ecosystem services to help decision makers in communities, states, regions, and tribes understand the total costs and benefits—as expressed in ecosystem service endpoints—of proposed land uses, demographic shifts, climate change, and increased demand for natural resources.