National Council for Science and the Environment

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Testimony of
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Regarding
"EPA's FY 2008 Science and Technology Budget Proposal"

To the
Subcommittee on Energy and Environment
Committee on Science and Technology
U.S. House of Representatives

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Summary

The U.S. Environmental Protection Agency research budget situation is chronically bad and getting worse. In order to fulfill its mission, EPA needs increased investments in both its intramural and extramural science programs as well as associated services such as environmental education and libraries. The proposed cuts in research areas are devastating exactly the areas EPA ought to be investing in socioeconomic, sustainability, ecological, and exploratory research as well as partnerships with academia and state and local government. These areas are essential to move environmental protection from a command-and-control regulatory system to a more rational, compliance-based approach.

The National Council for Science and the Environment (NCSE) urges Congress to appropriate a minimum of $700 million for EPA's Office of Research and Development (bringing it back to FY 2004 levels), including at least $150 million for EPA's Science to Achieve Results (STAR) research grants program and $20 million for EPA's STAR graduate fellowship program. We recommend a total of $900 million for EPA's Science and Technology account. NCSE also urges Congress to restore full funding for the Office of Environmental Education at a level of at least $10 million. Finally, we urge Congress to stop the ill-conceived and poorly-executed closure of EPA's libraries.

The National Council for Science and the Environment is dedicated to *improving the scientific basis for environmental decisionmaking*. We are supported by over 500 organizations, including universities, scientific societies, government associations, businesses and chambers of commerce, and environmental and other civic organizations. NCSE promotes science and its essential role in decisionmaking but does not take positions on environmental issues themselves.

NCSE's Council of Environmental Deans and Directors (CEDD) includes the leaders of environment programs at more than 130 colleges and universities in the U.S. These institutions produce the bulk of the nation's environmental scientists and environmental professional workforce. CEDD meets the critical national needs to ensure continued excellence in academic environmental programs and to provide a high quality environmental workforce and an informed public.

Introduction

Mr. Chairman, thank you for the opportunity to testify at this important hearing on science and technology at the Environmental Protection Agency (EPA). My name is Bruce Coull. I am testifying in my capacity as 2006-2008 President of the U.S. Council of Environmental Deans and Directors (CEDD) a program of the National Council for Science and the Environment (NCSE). I am also Carolina Distinguished Professor Emeritus and Dean Emeritus, School of the Environment, University of South Carolina in Columbia, South Carolina.

Previously, as Dean of the School of the Environment, I led the University of South Carolina (USC) to approach environmental issues through multidisciplinary research, education and community outreach. I headed the South Carolina Sustainable Universities Initiative (http://www.sc.edu/sustainableu), a multi-university project educating about frugal use of earth's resources and was the architect of the greening of the University of South Carolina. I also led USC's environmental efforts in the Ukraine related to the Chernobyl nuclear accident of 1986. Currently, I direct the South Carolina Lowcountry Initiative of the Chicago and New York-based Center for Humans and Nature (http://www.humansandnature.org). This initiative aims to assist local decisionmakers in making sensible use of resources in the South Carolina coastal region.

I am a marine biologist by training. I am here today to discuss the importance of greater investments in environmental research, education, and information and the consequences of chronic underinvestment on environmental decisionmaking.

Environmental Science and Decisionmaking

The call for decisions, environmental and otherwise, to be made on the basis of science is almost a mantra used across the political spectrum. Yet, behind the rhetoric, a simple truth remains. Without investment in science and in scientists, there can be no science-based decisionmaking.

Despite this statement of the obvious, many federal departments and agencies and those in Congress who fund them try to get environmental decisionmaking on the cheap. This has been the case with the Environmental Protection Agency for a very long time and the proposed budget only worsens this sorry situation. The EPA R&D portfolio of $540 million in the FY 2008 budget request would be a 3.3 percent cut from the likely 2007 funding level with increases for homeland security-related research somewhat masking cuts to most research areas. This would leave EPA's Office of Research and Development with its lowest budget since 2000 in nominal dollars and its lowest budget in constant dollars since at least 1990 (AAAS data).

In real dollar terms, **EPA's funding of science is nearly unchanged since at least 1990, and has been steadily declining since FY 2004** (Figure 1). In fact, the flat budget extends back at least as far back as the early 1980s. During these decades, the magnitude and complexity of our nation's environmental challenges has increased many-fold. Science, including that conducted by EPA, has helped us to make great advances with the local issues of point-source pollution. But the problems faced by EPA, our nation and our planet today encompass local, regional, national and even global scales. They will not be addressed by science-funding as usual. As then-Chairman Representative Vernon Ehlers said last year, "just as we can't afford to spend too much, we can't afford to spend too little."

A research budget of less than $600 million for an agency dealing with these challenges is simply unacceptable. In contrast, the National Institutes of Health (NIH) has an R& D budget of over $28 billion (50 times more than EPA research). NASA's budget of $12 billion is almost 20 times larger than EPA's research budget.

In order to focus on the highest priority issues and provide coordination for achieving its research goals, EPA's Office of Research and Development has produced multi-year plans (http://www.epa.gov:80/osp/myp.htm) for the following high priority research areas that are linked to EPA's five major stratetic goals:

Goal 1: Air

- Air Toxics
  Particulate Matter

Goal 2: Water

- Drinking Water
  Water Quality

Goal 3: Land

- Contaminated Sites
  Hazardous Waste

Goal 4: Communities & Ecosystems

- Ecological Research
  Human Health
  Human Health Risk Assessment
  Global Change
  Mercury
  Endocrine Disruptors
  Safe Pesticides/Safe Products

Goal 5: Compliance and Environmental Stewardship

- Economics and Decision Science
  Science and Technology for Sustainability

Nearly half of these issues were largely unknown 25 years ago, yet the amount of available funding is actually less. In fact, even the meager amount of money for most of these issues continues to decline.

We increasingly understand the connection between environmental quality and human health. Last month, "Integrating Environment and Human Health" was the theme of NCSE's 7th National Conference on Science, Policy and the Environment, which involved more than 800 scientists and decisionmakers. Numerous examples were presented to demonstrate the dependence of human health on the quality of the environment, including emerging diseases such as avian influenza, episodic diseases such as cholera, toxicants such as arsenic and mercury, and illnesses that result from our lifestyle such as the relationship between suburban sprawl, urban blight, other aspects of the built environment and a host of health problems including cardiovascular diseases and obesity.

Additionally, climate change is already having impacts on health, including more than 30,000 Europeans who died in the heat wave of the summer of 2003, Arctic peoples who are unable to continue subsistence hunting due to the rapidly melting polar ice caps, and the residents of the Gulf Coast and Atlantic coast killed, sickened or made homeless by intensified hurricanes such as Katrina. Scientists and professionals are once again realizing that we can't have healthy people in unhealthy environments. EPA, with its mission to protect human health and the environment is the ideal place for integrated research to happen and be funded, but funding levels are not sufficient to be effective. An editorial from this week's issue of Science magazine, by Richard Jackson, former Director of the CDC National Center for Environment and Health, who was one of the speakers at our recent conference, that shows the tight connection between environment and health is attached to this testimony.

EPA's strategic plan calls for science-based decision making, but it's not possible to achieve this goal if the agency's capacity to conduct science is continually reduced. EPA's strategic plan for 2003-2008 says, "EPA has identified reliance on sound science and credible data among the guiding principles we will follow to fulfill our mission to protect human health and the environment." EPA needs to reverse the decline in its capacity to conduct science in order to fulfill its mission.

EPA's proposed science budget

Compared to FY 2006, EPA's overall budget would fall $400 million or 5.5 percent to $7.2 billion under the President's FY 2008 budget, after a similar cut in 2006. EPA's shrinking R&D portfolio would decline to $540 million in FY 2008, after declining to $595 million in FY 2006 from $621 million in FY 2005 and a high water mark of $647 in FY 2004. Funding for most EPA research areas would decline. **EPA's R&D funding would fall to its lowest level in almost two decades in real terms** (Figure 1). If EPA's FY 2008 budget proposal is enacted, the agency's Science and Technology (S&T) funding would decline by $71 million or 12 percent since FY 2004 and the Office of Research and Development budget would decline by $107 million or 16.5 percent during the same period.

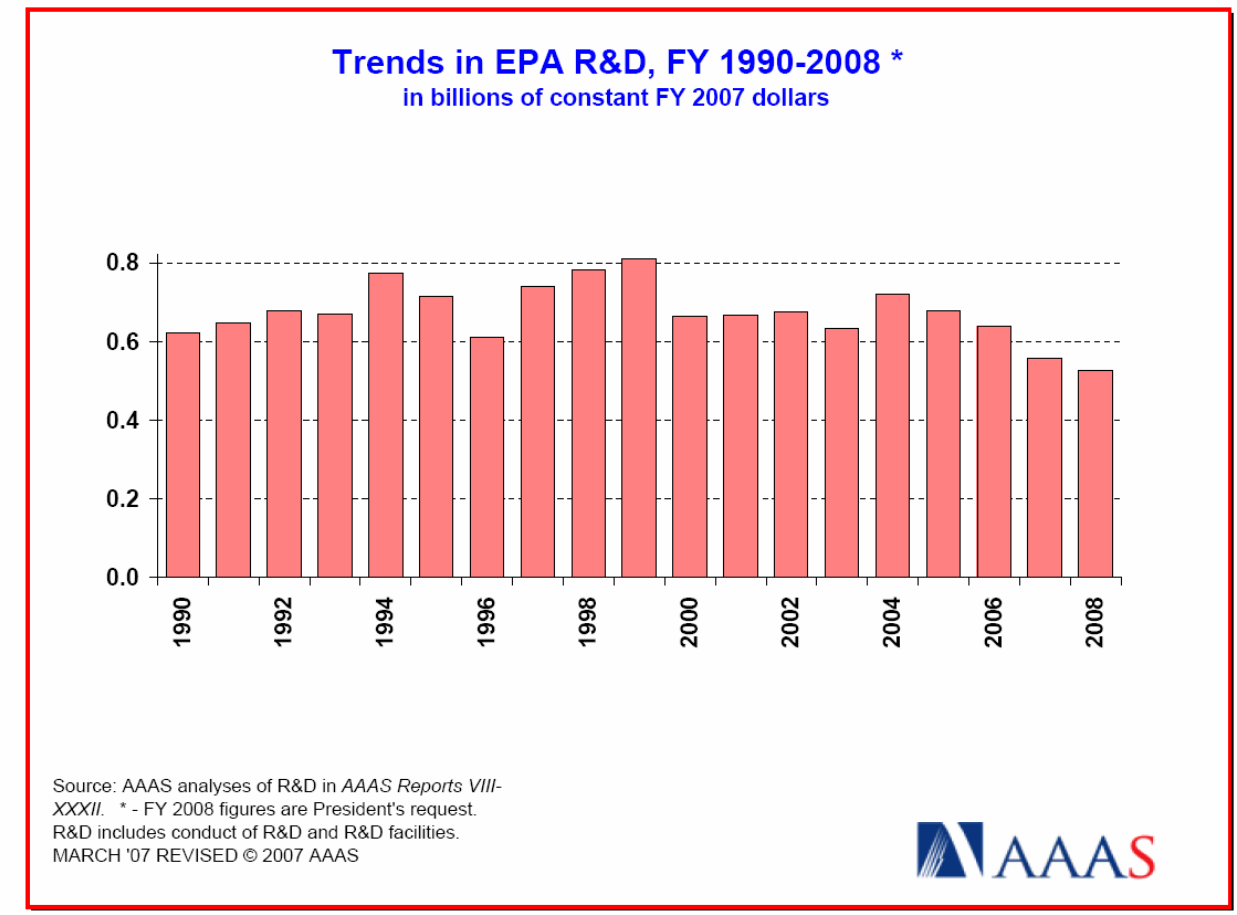

Figure 1. Trends in EPA R&D, FY 1990-2008 in real dollars.

A healthy research program depends on having sufficient resources to:

a. keep up with and use the newest scientific methods,
b. provide the most up-to-date scientific information for the agency's regulatory decisions and core research programs, and
c. build and maintain strong ties with the external research community and foster graduate student work in the environmental sciences.

Unfortunately EPA's research program is in a chronically unhealthy state. Despite major successful reforms (including a new extramural research and fellowship program) in response to criticisms leveled in the 1980s and early 1990s, EPA's ability to garner the best science for its decisionmaking has been constrained severely by a lack of resources. This is particularly vexing given the desire of many policymakers to move away from a "command and control model" to a more rational market-based approach to environmental performance. A market-based approach will succeed only if all participants have access to high quality science-based information on which to make their decisions. Additional science is needed to develop metrics of success and to monitor progress toward desired outcomes.

According to the President's budget demand, funding for EPA's S&T account is projected to fall in 2008, 2009, and 2010 before rebounding slightly in 2011. After adjusting for inflation, EPA R&D could fall a further 16 percent over the next five years. Even if Congress adds to the administration's request during the appropriations process, congressional add-ons may end up going to earmarked projects rather than to boost core EPA research programs, leaving most EPA research on a downward path with further cuts to come. This situation is unsustainable and should be unacceptable to this committee.

EPA's Extramural Science and Education Programs

EPA created the extramural Science to Achieve Results (STAR) program as part of a set of reforms to EPA science proposed by the National Academy of Sciences in the 1990s. STAR provides EPA an opportunity to better take advantage of the intellectual and scientific resources of the academic community and apply these resources to the challenges faced by EPA. It is EPA's principal means of getting the best environmental researchers in our colleges and universities to direct their attention to the most critical environmental problems of the nation. STAR grants complement EPA's own scientific staff by bringing an additional independent voice and excellence in additional fields of science. STAR also provides funds for preparing the next generation of environmental scientists and engineers, both through graduate fellowships and as research assistants on grants to faculty members. We note as of January 2006, Project Investigators (PIs) from colleges and universities included in CEDD have published more than 3463 journal articles (representing 43% of all journal articles published by NCER funded PI's). 36 Project Investigators have been listed as highly cited (publications influential for other researchers) authors. (CEDD accounts for 41% of all NCER funded PI's listed as highly cited.)

As we will show, this area has born the brunt of the recent cuts in EPA's research leading to critical problems not being understood and new environmentally beneficial technologies not being produced.

The STAR program has been widely praised. The National Academies issued a laudatory report, *The Measure of STAR*, which concluded that the program supports excellent science that is directly relevant to the agency's mission. According to the report, the STAR program has "yielded significant new findings and knowledge critical for regulatory decision making." The report says, "The program has established and maintains a high degree of scientific excellence." It also concludes, "The STAR program funds important research that is not conducted or funded by other agencies. The STAR program has also made commendable efforts to leverage funds through establishment of research partnerships with other agencies and organizations."

The EPA STAR research program compares favorably with programs at other science agencies. According to the National Academies report, "The STAR program has developed a grant-award process that compares favorably with and in some ways exceeds that in place at other agencies that have extramural research programs, such as the National Science Foundation and the National Institute of Environmental Health Sciences."

The STAR research grants program expands the scientific expertise available to EPA by awarding competitive grants to universities and independent institutions, to investigate scientific

questions of particular relevance to the agency's mission. The National Academies report says, "The STAR program should continue to be an important part of EPA's research program."

From the standpoint of a university administrator, our ability to set priorities is greatly influenced by patterns of federal funding. Where resources are made available, academic research will flourish and new discoveries will be made. This is happening in the biomedical sciences and society is reaping the benefits of increased funding for biomedical research. In areas such as environmental science, even though there is great interest among student and faculty, it is hard for us to establish new programs and hire new faculty and take on additional students if we know that funding is not likely to be available. STAR grants that support research centers and individual scientists allow universities to make their own investments with some assurance of concurrent federal support.

Research centers funded by the STAR program at universities affiliated with NCSE are making scientific breakthroughs on topics including:

- remediation of mine waste sites
- microbial risk assessment
- remediation of volatile organic compounds in groundwater and soil
- air quality – reducing the health effects of particulate matter and aerosols
- assessment of aquatic resources
- children's environmental health and disease prevention (several centers).

Funding for the STAR program has been cut repeatedly over the past several years. The FY 2008 request for the STAR programs (including fellowships) is $61.9 million, which is approximately 45 percent below the FY 2002 level of $110 million. If the proposal is enacted, STAR will have been cut by more than $21 million or 25 percent since FY 2004. NCSE proposes that the STAR research budget be increased to $150 million, which would allow expansion of areas and scientists supported and would send a signal that Congress is serious about merit-based science for environmental decisionmaking.

We do commend EPA for boosting grants to $5 million for exploratory research on the environmental effects of *nanotechnology*, an emerging issue which was the subject of Science Committee hearings last year. However, even in this case, the research is trying to catch up to a genie that is already out of the bottle. NCSE co-sponsored a conference with EPA's Office of Research and Development in fall 2005 on the possible benefits of nanotechnology for cleanup of hazardous wastes, such as contaminated ground water. Although, small scale field trials show considerable promise, the risks, large or small, are largely unknown. We also note with disappointment that absolutely no money is budgeted for exploratory research grants on any other subject. The nanotechnology research, as well as endocrine disruption research, originally came from the exploratory research area. The current budget leaves no money to study any new issues that emerge during the upcoming year or that have been identified but not studied.

Table 1 shows a breakdown of EPA extramural research by program area and fellowships over the past 5 years. It also shows a breaking down of the extramural program itself. Prior to the period shown on Table 1, the STAR program provided approximately $100 million annually in research grants from FY 2000 to 2002. The proposed budget for FY 2008 would reduce that total to $56 million – a stunning cut of 44% during the current Administration.

This table shows continued attrition and termination of research programs. Research grant areas terminated since 2004 include:

- Water quality
- Land protection and restoration
- Endocrine disruptors
- Ecosystems (formerly more than an $18 million annual investment)
- Mercury
- Pollution Prevention
- Sustainability
- Economics and Decisionmaking
- General exploratory research

Each of these shutdowns has real world negative consequences. I provide a few examples, but there are many more. In addition, most of the research areas presently still addressed by EPA are done so in a paltry fashion with the expenditures for research very small relative to the scale of the problem.

Consequences: Research Funding Cuts Lead to Health and Environmental Problems

Endocrine Disruption. EPA's grants for research on endocrine disruption (ED), which totaled $4.6 million in FY 2003, were terminated in the FY 2007 budget request. EPA's $10 million request in this field is down nearly 20% since FY 2003.

Examination of the phenomenon of endocrine disruptors (chemicals that mimic naturally occurring hormones, many of which are passed from the mother to the developing fetus and affect sexual and other types of development) provides examples of the consequences of these terminations. Headlines are raising questions about bisexual fish in rivers across the US and are reporting the loss of more and more natural commercial fisheries around the world. International biomedical experts are agreeing that the growing incidence of human male reproductive organ disorders including testicular cancer, are the result of prenatal exposure to environmental chemicals. In the US, there has been an age-independent decline in testosterone levels in men over the past twenty years. Epidemiologists have linked unusual external genitalia development in newborn boys with plastic components in their mothers' urine during pregnancy. The Centers

for Disease Control and Prevention report that one in 150 children born today has an autism spectrum disorder. The latest evidence concerning the role of environmental contaminants and reproductive health from the gene and early stages of development to the gray-haired population is extremely worrisome. Yet, despite the all evidence of growing numbers of trans-generational disorders that were rare only two generations ago, ED research at in the Office of Research and Development is declining.

In South Carolina, endocrine disruptive chemicals are used on golf courses at several locales, including Hilton Head Island, both as pesticides (e.g. Fipronil), and via treated sewage effluent that is used for irrigation (such effluent contains estradiols, birth control remnants, antibiotics etc.), which run-off into the very productive estuarine salt marsh systems. Colleagues at the University of South Carolina and the NOAA National Ocean Science Laboratory in Charleston were funded by EPA via the endocrine disruption program to determine the effects on commercially important estuarine species. They have discovered that crustaceans (shrimp, crabs, copepods) have their reproduction shut down when exposed to these chemicals and that some fish are unable to reproduce and have both male and female characteristics when exposed. The question now is how are these chemicals passed up food chains, what is the impact on coastal fisheries yields, can humans bioaccumulate these endocrine mimics, and what are the effects? Despite these findings, present funding is now 25% of what was originally funded by EPA. Clearly, eliminating the endocrine disruption research grants program will not provide the data for informed decision making related to environmental and human health

Mercury. EPA research on mercury has been reduced to $4.3 million in FY 2008 (slightly up from 2006) from $7 million in FY 2004. Grants for mercury research were terminated in FY 2005. According to ORD's Multi-year plan (MYP): "A 1997 EPA Mercury Study Report to Congress discussed the magnitude of mercury emissions in the United States, and concluded that a plausible link exists between human activities that release mercury from industrial and combustion sources in the United States and methyl mercury concentrations in humans and wildlife. Regulatory mandates require EPA to address these risks. The Agency is developing risk management research for managing emissions from coal-fired utilities (critical information for rule-making) and non-combustion sources of mercury; risk management research for fate and transport of mercury to fish; regionally-based ecological assessments of the effects of methyl mercury on birds; assessment of methyl mercury in human populations; and risk communication methods and tools. EPA has established two long-term goals for mercury research. The long-term goals established in this MYP are:

1. To reduce and prevent release of mercury into the environment.
2. To understand the transport and fate of mercury from release to the receptor and its effects on the receptor.

However, as a result of the cuts to the already small budget, EPA is not presently studying the cycling of mercury in the environment. Thus it is hard to imagine how EPA will accomplish these goals.

Ecosystems. As recently as FY 2004, EPA was spending $108 million on ecosystem research. In FY 2005, what had been an $18 million program of grants for ecosystem research was completely eliminated from STAR. The FY 2008 budget request would further reduce funding

for ecosystem research to $68 million. At this level, essentially all external participation – grants, cooperative agreements and contracts - would be eliminated. The remaining EPA researchers who were able to produce a major product every year or two would only be able to produce a major product every four to six years. Additionally, the most recent cuts will limit the participation of state and local government in the Environmental Monitoring and Assessment Program (EMAP).

The ecosystem research program is combined with human health in ORD Goal 4, so it is sometimes difficult to determine what constitutes ecosystem research. Additionally, there is some confusion about the relationship between the water quality research program and ecosystem research, although there is actually little overlap. We hope that with a new emphasis on valuation and ecosystem services, this research program will grow again.

Sustainability, pollution prevention, economics and decisionmaking. The suite of research efforts in pollution prevention, sustainability, and economics and decisionmaking are EPA's pro-active agenda to get ahead of environmental problems through prevention, development of new technology, and partnerships with state and local government and other stakeholders. The Office of Research and Development should be commended for developing a sustainability strategy that was recently approved by EPA's Science Advisory Board.

As documented at our recent national conference, the field of "green chemistry" - using products designed from nature without harmful side effects – offers great promise to reduce the need for regulation and contamination. Everything from natural, short-lived biodegradable pesticides to new energy sources can be made safer and will provide great economic opportunities as well as environmental and health benefits. Sustainability provides new partnerships as well as new technologies. Communities and other stakeholders are brought into the research program from the beginning.

Unfortunately, ORD's efforts to be pro-active and implement a new sustainability approach, as is being done in the business community is being undermined by debilitating cuts to a budget that is too small already. The very small but effective grants program in Cooperative Science and Technology is to be terminated in the FY 2008 budget. This program provided grants to states, counties and others from New York City to Puerto Rico that need science to help resolve or prevent problems.

The remaining sustainability research is largely what had been called pollution prevention. This intramural program includes key tools to support decisionmaking such as life cycle analysis, metrics of sustainability and flows of materials, technological assistance, including using SBIR incentive funding to develop and commercialize innovative environmental technologies needed by EPA regions and states and agency regulatory and compliance programs to protect human health and the environment. Sustainability research is planned to be cut to $ 22.5 million, a little more than half of the $42 million provided as recently as FY 2004.

Initiated in 1994 and modified in 1999, the STAR grant Economics and Decision Sciences (EDS) program supports innovative economics and decision science research. It is the only significant research effort at the EPA that addresses behavioral science research issues. EDS results have led to decreased pollution control costs, and improvements the efficiency and effectiveness of environmental policies. These practical and usable results improve

understanding of polluter motivations as well as the incentive structures of policies and how people value human and ecosystem health.

According to a 2005 presentation by Kohler and Clark for the Association of Public Policy Analysis and Management, the EDS program "has established an incredible track record that has generated practical results now being used by environmental policymakers throughout federal, state, local and international governments." STAR EDS research is influencing the design of international and federal multi-pollutant legislative initiatives. EDS research on cost-benefit analysis "contributed to the Office of Management and Budget's recommendation that EPA not use an age-adjustment factor in its cost-benefit analyses of air quality regulations." Another important beneficial outcome of EDS research has been information that enables states to efficiently prioritize habitat protection programs. EDS research is providing local governments tools to preserve their most important local lakes, streams, and wetland. They also provide numerous examples of how this research has been used by various EPA offices and the private sector as well.

Kohler and Clark conclude, "Since its inception, funding for EDS research has amounted to $20 million over approximately 10 years, averaging 2 million per year. Potential savings from widespread application of economic incentives to solving environmental problems could reach $45 billion annually (Anderson and Lohof 2001). On a practical level, acid rain trading savings are at least $700 million annually. Research on the *private* benefits of R&D shows that the market value of private spending on R&D is capitalized at a rate of 2.5 to 8 (with most estimates centered at 5 and 6) (Hall 2000). By comparison the *social* benefit of EDS R&D can range up to 22,500 times the investment of public money in research, assuming that *all* average annual funding for EDS research to date can account for these potential $45 billion annual savings. However, this back-of-the-envelope calculation does not include the investment in time of policy makers and legislators necessary for new legislative initiatives. Assuming that only 1% of the potential savings accrued to the U.S. society are associated with EDS research would yield an annual benefits rate of 225. More specifically, funding for the Burtraw study amounted to $251,000 over two years, and can be associated with up to $700 million savings per year from trading programs – a rate of 56 times (assuming a 1% association between EDS research and public benefits), which is well above the market value of private sector R&D."

Despite these successes, this high impact, low cost $2 million grant program is scheduled for elimination in FY 2008.

Without these innovative approaches that underlie a preventative, flexible and market-based approach, environmental protection will be left with the same old command and control system to ineffectively minimize the number of poisons that industrialized society feeds ourselves, our children, and our fellow living beings.

Graduate Fellowship Programs

To ensure a strong supply of future environmental scientists and engineers, EPA created the STAR Fellowship program. There is considerable concern about the retirements of the baby

boom generation and the need to replace the scientific and technical skills of the federal, state and private workforce. The STAR fellowship program is the only federal program aimed specifically at students pursuing advanced degrees in environmental sciences. According to the National Academies report, "The STAR fellowship program is a valuable mechanism for enabling a continuing supply of graduate students in environmental sciences and engineering to help build a stronger scientific foundation for the nation's environmental research and management efforts." A majority of the STAR Fellows conduct ecological research, where the funding sources are very scarce compared with environmental health. We note that a large percentage of the STAR fellowships have been awarded to graduate students in CEDD member universities and colleges. As of January 2006, 88 of 134 CEDD institutions have been awarded NCER grants or fellowships. A total of 581 grants (including 26 centers), and 595 fellowships have been awarded to CEDD institutions for a total more than $389 million dollars

As academic administrators of most of the nation's environmental programs, the CEDD membership recognizes increasing student interest to "do something for (or about) the environment". There are many, many bright deserving students who want to work to make the Earth a better and safer place to live. There is also a cadre of young faculty truly dedicated to working across disciplines to affect good decisionmaking based on science. Increases in the STAR program are important to produce the scientists and engineers needed for the future.

The STAR Fellowship program has also been repeatedly proposed for budget cuts by this Administration, only to be restored each year by Congress. Ironically, because Congress has restored funds after this program was zeroed out by the Administration in the FY 2003 request, the EPA regards the STAR fellowship to be "an earmark". The budget for the fellowship program has been slightly under $10 million for most of its 10 year history. However, because of the unusual appropriations process for FY 2006, EPA is only adding $1.8 million to the FY 2006 request of $5.9 million for a total of $7.7 million in the soon-to-be-released EPA operating plan. Thus the program and the number of graduate students it can support is being reduced by some 20% this year.

The President's budget request has again has proposed cuts in the STAR graduate fellowship program to $5.9 million (an additional cut of some 20%). As noted in the Science committee's Views and Estimates on the FY 2007 budget, this is "one of the most troubling decreases". The committee stated that "the fellowship program should be funded at $10 million, the level restored by Congress in each year beginning with FY 03." We thank this subcommittee under former Chairman Ehlers for its leadership and strong support to keep the STAR fellowship program alive although it is now wounded. We hope that under the leadership of Chairman Lampson and Ranking Member Inglis, you can help this program and the number of environmental scientists and professionals it produces to grow.

The STAR fellowship program is highly competitive, with only 7 percent of applicants being awarded fellowships. The current level of funding is insufficient to allow all students whose applications are rated as excellent to receive fellowships and it is insufficient to meet national needs for a scientifically trained workforce. Based on the experience of NCSE staff as reviewers of the STAR fellowship applications and CEDD members as advisors for students who have applied for and have not received fellowships, we recommend doubling the funding for STAR fellowships to $20 million, which can be accomplished without any decrease in the quality of the awardees.

The lack of diversity in the environmental field, which is one of the least diverse fields of science, is also a key issue, as the demographics of America are rapidly changing. EPA has begun to address this challenge by creating the Graduate Research Opportunities (GRO) Fellowship. This program was intended to be specifically for students from ethnic minorities, but it now needs authorization to allow a focus on diversity as well as dedicated and sufficient funding. We recommend that the Science committee authorization of EPA research in FY 2008 include specific language restoring the purpose of the GRO Fellowship to bring more minorities into the environmental field.

Office of Environmental Education

The FY 2008 budget request once again proposes no funding for the EPA Office of Environmental Education. Since 2003, the Administration has tried to zero out this office, which support the programs mandated by the National Environmental Education and Training Act, programs administered by this office. The Congress has seen fit to appropriate about $7-9 million each year over the past decade. However, as with the STAR fellowship program, EPA regards it as an earmark, so its future is uncertain. NCSE strongly encourages Congress to restore funding of at least $10 million. The programs of the Office of Environmental Education provide national leadership for environmental education at the local, state, national and international levels, encourage careers related to the environment, and leverage non-federal investment in environmental education and training programs. We also request that the Science Committee encourage the Education Committee to re-authorize and strengthen the National Environmental Education Act of 1990 (PL 101-619), as the funding authorization under this law expired in 1996.

EPA Libraries

Every scientist needs access to a library in order to keep current on developments in the field and to support their professional activities. EPA had an exemplary library system, where as a network, every library at EPA helped their colleagues every day in many ways to keep EPA's information services viable. The EPA Headquarters libraries and the 27 regional and laboratory libraries, staffed with experienced, professional librarians who facilitate access to information, fielded 134,000 research requests from EPA scientists and enforcement staff and others in the last year. The EPA Libraries house and catalog unique collections, including approximately 50,000 primary source documents not available elsewhere in any format, on vital environmental issues. They also serve as institutional repositories for internal documentation as well as commercially published literature about the topics agencies regulate, investigate, and research; operate public reading rooms, providing access to collections that are specifically tailored to meet the needs of constituents in their geographic region, at times specifically offering that access to comply with federal law.

Despite this, EPA is in the process of dismantling this network, with no coordination budget and at least 7 locations closed, ostensibly to move to online information systems. The proposed FY 2007 budget for EPA Libraries contained a $2.5 million cut, which, according to the American Library Association has already resulted in the closure and imminent closure of some

headquarters, regional and laboratory libraries and the reduction of staff at other EPA Libraries; will put the collections and services of the EPA Libraries at risk, causing essential information about the environment to be lost; would compromise the public's health and safety by making it difficult, even impossible, for the EPA staff and scientists, other scientists and researchers, the public, contractors and regulated industries, and federal, state, and local policymakers to find accurate and high-quality information upon which to base decisions about health and safety concerns. Foremost among the critics of the EPA plans to close or reduce services and access to collections and otherwise remove information resources critical to the EPA's mission, are the EPA employees. Within weeks of implementing plans to close regional libraries and libraries and special library collections in the EPA Head Quarters in Washington, DC, the presidents of 17 union locals representing more than 10,000 EPA researchers, scientists, and support personnel, lodged formal protests against these EPA actions.
(http://www.peer.org/docs/epa/06_29_6_union_library_ltr.pdf)

The EPA could have made a very cogent statement about their need to reconfigure the entire EPA Library Network. They could have easily justified closing some of the individual libraries. However, the complete lack of a management plan and an 80% cut in the budget to see such a transition through to completion leads us to question both the intent and effectiveness of the closures. With a $2.5 million increase in its budget to see that such a reconfiguration was done properly with great care given to seeing that the transition was done effectively, efficiently, and with equity, the EPA Library Network and its managers could have designed one of the largest scientific libraries (or information centers) of the 21st century. We recommend that Congress direct EPA to cease the closures and prepare a management plan and a budget of sufficient magnitude to allow transition to a state-of-the-art environmental information system.

Conclusion

In order to fulfill its mission, EPA needs increased investments in both its intramural and extramural science programs, as well as such associated services as environmental education and information. The National Council for Science and the Environment and our Council of Environmental Deans and Directors urges Congress to appropriate a minimum of $700 million for EPA's Office of Research and Development (bringing it back to FY 2004 levels), including at least $150 million for EPA's Science to Achieve Results (STAR) research grants program and $20 million for EPA's STAR graduate fellowship program. We recommend a total of $900 million for EPA's Science and Technology account. NCSE also urges Congress to restore full funding for the Office of Environmental Education at a level of at least $10 million and to terminate the effort to eliminate EPA libraries absent a sufficiently funded modernization and management plan. Even these levels of funding would, for the most part, bring EPA science back to its level in FY 2004. We hope that in future years, EPA's science budget will grow to better match the nation's needs.

In the case of EPA, there is a strong relationship between input to environmental research and education and output in terms of environmental protection. If the nation wants more effective and efficient environmental protection, we need to make the upfront investment in science. It really is the ounce of prevention that is worth many pounds of the cure.

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Dr. Bruce Coull is the 2006-2008 President of the U.S. Council of Environmental Deans and Directors (CEDD) a program of the National Council for Science and the Environment (http://www.ncseonline.org/CEDD). He leads this professional organization of deans, institute directors and environmental program administrators at more than 130 colleges and universities across the U.S. CEDD is carrying out projects to improve environmental curriculum, better prepare alumni for environmental careers, increase diversity in the field and to advance interdisciplinary education. CEDD works with partner organizations in Canada and the UK.

Dr. Coull recently became emeritus at the University of South Carolina, where as a Carolina Distinguished Professor and Dean of USC's School of the Environment, Coull led USC to approach environmental issues through multidisciplinary research, education and community outreach. He headed the South Carolina Sustainable Universities Initiative (http://www.sc.edu/sustainableu), a multi-university project educating about frugal use of earth's resources and was the architect of the greening of the University of South Carolina. He also led USC's environmental efforts in the Ukraine related to the Chernobyl nuclear accident of 1986. In his emeritus status he directs the South Carolina Lowcountry Initiative of the Chicago and New York based Center for Humans and Nature (http://www.humansandnature.org). This initiative aims to effect sensible use of resources in the South Carolina coastal region. Local decisions makers are the target of this project.

Coull was educated at Moravian College and Lehigh University - both of which are located in Bethlehem, Pennsylvania. He was a postdoctoral fellow at the Duke University Marine Laboratory in North Carolina and an Assistant Professor at Clark University, Massachusetts before joining the University of South Carolina (USC) faculty in 1973. While at USC he taught over 10,000 students in Marine and Environmental Sciences and held research grants from the Environmental Protection Agency (EPA), the National Science Foundation (NSF), the National Oceanic and Atmospheric Association (NOAA) and multiple private foundations. He has directed over 60 theses and Ph.D. dissertations at USC.

He was a senior Fulbright Research Fellow at Victoria University of Wellington, New Zealand in 1981 and a visiting professor in Marine Sciences at the University of Queensland, Brisbane, Australia in 1994. He was president of the American Society of Zoologists, the American Microscopical Society, and the International Association of Meiobenthologists as well as advisor to the European Community on Marine Pollution. He is the author of 130 scientific papers in Ecology, Ecotoxicology and Sustainability in Higher Education and the editor of four Marine Ecology books.

He is married to Judith, a graduate of Wheaton College, Massachusetts. They have two children, Brent (Associate Professor of Biostatistics, Harvard University) and Robin (Social Worker, Brooklyn, NY) and one grandchild. Hobbies include fishing, walking, canoeing, and nature-based tourism.

Program / Project	FY 2003 Enacted Budget	FY 2004 Enacted Budget	FY 2005 Enacted Budget	FY 2006 Enacted Budget	FY 2007 President's Budget	FY 2008 President's Budget
	Extramural	Extramural	Extramural	Extramural	Extramural	Extramural
Research: Particulate Matter[1]	$17.1	$13.0	$15.8	$0.0	$0.0	$0.0
Research: NAAQS[1]	$0.0	$0.0	$0.0	$16.7	$17.2	$0.0
Research: Clean Air[1]	$0.0	$0.0	$0.0	$0.0	$0.0	$17.2
Research: Drinking Water	$2.5	$3.6	$4.5	$4.4	$4.6	$4.6
Research: Water Quality	$1.2	$1.1	$0.9	$0.9	$1.0	$0.0
Research: Land Protection and Restoration	$2.2	$2.7	$0.0	$0.0	$0.0	$0.0
Research: Computational Toxicology	$2.4	$2.4	$3.4	$3.3	$3.4	$3.4
Research: Endocrine Disruptors	$4.6	$2.7	$0.0	$1.6	$0.0	$0.0
Research: Fellowships	$9.7	$9.5	$9.2	$9.3	$5.9	$5.9
Research: Global Change	$4.8	$6.7	$6.7	$6.5	$6.7	$6.3
Research: Human Health and Ecosystems	$39.5	$37.6	$27.5	$26.0	$23.6	$23.6
Ecosystems	$18.4	$13.4	$0.0	$1.5	$0.0	$0.0
Human Health	$14.5	$15.4	$18.1	$18.1	$18.6	$18.6
Mercury	$2.0	$1.8	$0.0	$0.0	$0.0	$0.0
Exploratory Grants (Nanotechnology)	$4.6	$4.0	$3.9	$3.9	$5.0	$5.0
Exploratory Grants (Non-Nanotechnology)	$0.0	$3.0	$5.5	$2.5	$0.0	$0.0
Research: Pesticides and Toxics	$0.0	$1.0	$1.0	$1.0	$1.0	$1.0
Research: Pollution Prevention[2]	$5.5	$5.2	$2.1	$0.0	$0.0	$0.0
Research: Sustainability[2]	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Research: Economics and Decision Sciences[2]	$0.0	$0.0	$0.0	$1.9	$2.0	$0.0
Total	**$89.4**	**$85.5**	**$71.1**	**$71.7**	**$65.3**	**$61.9**

1. In FY 2006, Research: Particulate Matter and Research: Tropospheric Ozone merged to form Research: NAAQS. In FY 2008, Research: NAAQS and Research: Air Toxics merged to form Research: Clean Air.

2. In FY 2006, Pollution Prevention divided into its constituent programs (Research: Sustainability and Research: Economics and Decision Sciences).

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Environment Meets Health, Again

THE SEEMINGLY INSURMOUNTABLE HEALTH CHALLENGE IN THE 19TH CENTURY WAS infectious disease. In the 21st century it will be a mix of global warming, poverty, and infectious and chronic diseases. Life expectancy in the United States is now twice that of the 19th century, and environmental health—healthier food, cleaner water, better places to live (the "built environment")—has been the greatest contributor. Can environmental health address 21st-century challenges?

Environmental health in the 19th century was practiced by physicians and scientists, but, importantly, also by business people, engineers, lawyers, architects, politicians, and many others outside health and science. The primary tools for health improvement were infrastructure and sanitation. For example, it was Frederick Law Olmsted, the man behind urban landscapes like New York City's Central Park, who headed the Sanitary Commission during the Civil War that saved thousands of lives.

Over the past 50 years, environmental science and practice have become specialized but also fragmented. The U.S. Environmental Protection Agency, which was created largely out of federal health programs in 1970, focused on legal and engineering strategies related to air and water pollution, as well as species and land protection. Meanwhile, environmental health practitioners in local agencies hunkered down to enforceable and fee-supported activities like food service inspection. And environmental health scientists increasingly emphasized mechanisms of toxicity or illness within biological systems.

This separation led to decisions where a solution for one problem created unexpected collateral effects: the chemical MTBE that was added to gasoline to prevent air pollution caused groundwater contamination; flame retardants required in consumer products turned out to be human milk contaminants and carcinogens. Today, environmental health in the United States is vested in many agencies, not just those titled Environment or Health, but also Transportation, Education, Housing, Energy, Agriculture, and Defense. Each has its critical primary mandate, but each influences essential elements of the requirement to protect health and the environment. The complex challenges of the 21st century cannot be met by a set of stovepipes as disconnected as these.

Can we fix the present system? Two illustrations, one historical and the other emerging, lend hope. The first was the success of the focus on children's environmental health in the 1990s. The Food Quality Protection Act of 1996 required that children's health be the benchmark for decisions on allowable levels of pesticide residues in food, the tenet being that protecting the most exposed and sensitive in the population protects everyone. At the 10th anniversary of this Act, one-third of pesticide tolerances have been revoked. Recognizing the improvements that a children's health initiative could bring about, President Clinton ordered that all agencies develop strategies to improve the health of children, and mandated twice-yearly cabinet-level meetings to make it happen. After a cautious and questioning start, each agency recognized that it had large impacts on children's well-being, for example, Transportation in terms of safe routes to school or Housing in terms of indoor air quality. Several important efforts, including the proposal for the National Children's Study, grew out of this initiative.

The second example is more contemporary. Public health leaders are asserting—as had leaders 150 years earlier—that the built environment profoundly influences health. The focus this time is not urban tenements, but rather the fragmented and sprawling communities that foster car dependency, inactivity, obesity, loneliness, fossil fuel and resource consumption, and environmental pollution. Concern about the built environment's effects on health has caught fire, with joint health and urban-planning conferences and strategy sessions, pending legislation, and an increasing number of new scientific studies. Disciplines long estranged from health issues—planners and architects, environmentalists, even builders and developers—are becoming engaged. It's a good time to spread ownership of health and environment challenges. The challenges of the 21st century will require leadership and collaboration. It worked in the 19th century; it can work today.

-Richard J. Jackson

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