

# Crossroads

A Quarterly Newsletter of The H. John Heinz III Center for Science, Economics and the Environment

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## THE HEINZ CENTER

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The Heinz Center is a nonpartisan, nonprofit institution dedicated to improving the scientific and economic foundation for environmental policy through multisectoral collaboration. The Center fosters collaboration among industry, environmental organizations, academia, and all levels of government in each of its program areas and projects.

## One Dam Thing after Another Dams and Dam Removal

Dams figure large both in the American imagination and on the American landscape. And it's not just in America that dams have made their mark. Dams date back at least 5000 years, in Egypt. The oldest dam still in use is a rock-fill structure on the Orontes in Syria, built about 1300 B.C. These early dams were used to provide a water supply to nearby cities and to feed irrigation systems, and dams still serve these purposes today, among many others.

In North America, Native Americans built dams for agriculture—the remains of check-dams can be seen at many ancient Pueblo sites in the Southwest—and for managing fish stocks. On

both coasts and around the Great Lakes, Indians built fish weirs across streams to guide and concentrate the migrating fish—Atlantic and Pacific salmon, sturgeon, shad, alewives—so that they could be husbanded and harvested. Once European settlers arrived, more dams were built, at first to power grist, saw, and paper mills and then to provide a steady source of water for the canal system. As the Industrial Revolution took hold, more and more streams were dammed to power factories directly and later to generate electricity. Irrigation, navigation, flood control, and water supply are also provided by dams. Over time, some dams cease to play the role they were designed for; many

of these have been left in place, blocking the free flow of the stream but no longer providing the benefit to offset the loss. The same pattern played itself out in Western Europe as well—as early as the beginning of the 18th century there were 100,000 dams in France alone.

No one knows for sure how many dams there are in the United States today, but the National Research Council estimates that there are at least 2.5 million. In Pennsylvania, for example, there is no stream that is unaffected by a dam. According to FEMA's Office of Dam Safety, about 80,000 dams in the United States fit the congressional definition that appears in legislation: dams that are at

least 6 feet high and impound at least 50 acre-feet of water, or that are at least 25 feet high and impound at least 15 acre-feet, or that pose an obvious downstream hazard. Hazardous dams are always counted, regardless of their size.

What this all means is that there are thousands of small dams in this country, some of them hundreds of years old, that serve no purpose but that continue to affect the ecology of the stream, both upstream and downstream. Fish are prevented from migrating, and economically and environmentally important fish stocks—and the way of life that **(continued on page 4)**



The trustees and staff of  
The Heinz Center wish you  
a Happy Holiday season and  
a peaceful and prosperous  
New Year

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## From the President

As our year hastened to a close, Hurricane Isabel darkened much of the mid-Atlantic—a vivid reminder that environment cannot be ignored.

The Heinz Center's own publications—*Human Links to Coastal Disasters*, published in 2002, and two earlier volumes, *The Hidden Costs of Coastal Hazards and Evaluation of Erosion Hazards*, both published in 2000—provide immediately relevant lessons. They highlight that “natural disasters” are *unnatural* to the extent that human decisions, such as building on floodplains, create vulnerabilities—and that they can be avoided or at least greatly reduced by collaboration among the four sectors of government, business, academia, and environmental groups.



Just over a year ago, The Heinz Center published *The State of the Nation's Ecosystems*, a product of five years of effort to provide an overview of the ecosystems that are so fundamental to our well-being. This autumn brings the first annual update of the data behind that landmark report. Another five years of effort on this topic is well under way—to refine the data and the indicators, to fill in data gaps, and to examine how such an important activity ultimately might best be institutionalized. We already have new working groups addressing issues of invasive species and fragmentation of ecosystems, topics that are sure to be highlighted in the next report. And knowing how important the national economic indicators are, we dream of a day when our work will be seen as the equally indispensable ecological equivalent.

Besides the coastal disaster report, the Sustainable Oceans Coast and Waterways program also produced *Dam Removal Research: Status and Prospects*, a companion volume to last year's *Dam Removal: Science and Decision Making*. Tens of thousands of small dams—more than 3000 in Pennsylvania alone—survive in this country from the early days of the Industrial Revolution and even before, their purposes often past and their future often a potential liability (see page 1 for more on dams and dam removal). Our reports are helping decision makers determine what factors to consider when dam removal is a possibility. Another report from this program, *The Coastal Zone Management Act: Developing a Framework for Identifying Performance Indicators*, is an important

contribution to better management of the critical coastal zone. The program's current major activity, Sharing Innovations in Coastal Zone Management, promises to be of immediate value to coastal zone managers who are wrestling with the problems of how to do their jobs more creatively and more effectively.

The Global Change Program has conducted a global assessment of rapid land-use change on behalf of the Millennium Ecosystem Assessment. The results, to be published later this year, will create for the first time a systematic process and database for identifying those places on the Earth's surface where the most rapid change has taken place because of human activities. The results will be immediately useful to a wide range of decision makers and the scientific community. The Heinz Center has also taken the lead on identifying ways in which new information technology has transformed forest policy and conservation (in collaboration with SCOPE, the Scientific Committee on Problems in the Environment), and has supported the Energy Futures Coalition. And just recently, for the World Parks Congress, we prepared a paper on global change and protected areas as a guide for protected area managers, who must cope with changes that they cannot prevent themselves (see page 6 for more on the Parks Congress). During the coming year, The Heinz Center will be initiating a new policy dialogue on how to identify acceptable limits to atmospheric greenhouse gas concentrations. The implications of climate change for biodiversity alone indicate that this is one of the most central—and one of the most difficult—environmental questions of all time.

The Center has seen many changes over the past year. Anthony Janetos became Vice President in May, succeeding Robert Friedman, who took on new

challenges after years of great contribution to the Center. We have also brought Sharon Phenneger on board as our new Chief Financial Officer. The new management team includes for the first time a Development Director, Anne Hummer, and a Director of Communications, Jeannette Aspden. *Crossroads* has become the first regular communications vehicle in the Center's history.

The Vira I. Heinz Endowment has provided a major gift that allows the Center to focus its energies anew on its programs while building endowment, an ongoing capacity for development, and a communications strategy. And the Friends of the Heinz Center came into existence, a group of individuals and corporations that believe in and support the Heinz Center's mission (see page 6 for more on the Friends).

We also welcome new trustees Shirley Malcom, Jerry Melillo, and Bud Ris, all of whom joined the Board in 2003, and we are delighted that former trustee Donald Kennedy will address the Heinz Center's Annual Dinner on "Sustainability: Can Science Get Us There?"

As we head into 2004, I believe The Heinz Center is positioned to make even greater contributions toward finding sustainable solutions to difficult environmental issues. The need for the four-sector approach has never been clearer, nor has the challenge of sustainable development ever been more urgent or important. The Heinz Center aspires to be the institutional first choice for those seeking such solutions. Though the challenges of the coming years are great, The Heinz Center is prepared to bring the strengths of all four sectors to bear on their identification, analysis, and solution.



# One Dam Thing after Another

## Dams and Dam Removal

(continued from page 1)

depends on them—are threatened. Some of these dams are “orphaned”—that is, their ownership is unclear, and some old dams may pose a downstream threat to people as well as other species. In fact, the 1889 Johnstown Flood, caused by the collapse of a dam, is still the worst unintentional man-made disaster in U.S. history, having taken more than 2200 lives in a single day.

In a recent interview, William L. Graf, professor of geography at the University of South Carolina and a leading authority on dam removal, highlighted the “significant connection between dam removal and the Endangered Species Act.” He pointed out that at least half of all endangered animal species are affected by dams, among them several Northwest salmon species,



South Fork Dam as it was before the break, Johnstown, Pennsylvania.

the Silvery Minnow in the Rio Grande, the Pallid Sturgeon in the Platte River, and Atlantic salmon and American eel in East Coast rivers. He

pointed out that several dams have already been removed to help fish migrate upstream to their spawning grounds. The 160-year-old Edwards Dam on the Kennebec River in Maine was removed in 1999, and migratory fish, including salmon, striped bass, sturgeon, alewives, and shad, have returned to the river. Just recently, PPL Corporation, conservation groups, the Penobscot Indian Nation, the State of Maine, and the U.S. Department of the Interior announced an agreement aimed at restoring the migratory fish to the Penobscot River. The Penobscot River Restoration Project will mean the removal of three dams, and it will significantly improve access to over 500 miles of river habitat, allowing for the recovery of native species of migratory fish. Among other dams slated for removal is the 80-year-old Savage Rapids Dam on the Rogue River in Oregon, pictured on page 1, above. And on the Savannah River in South Carolina and Georgia, the relicensing of the Augusta Canal is the subject of a major study involving state and federal agencies; the

Augusta Diversion Dam (see page 1, below), first built in 1845 and enlarged in 1875, is part of the canal system.

Awareness of the dangers of obsolete and unneeded dams and the benefits of removing them has been growing, and many decisions on the future of small dams involve local, state, and national-level government, private landowners, and the public. The Heinz Center has taken the lead in providing decision makers with the information they need. By bringing together experts on dam removal from all four sectors—industry, all levels of government, academia, and environmental organizations—the Center is able to generate solutions and recommendations that can be accepted and adopted by all stakeholders. In all these decisions, the benefits and costs of removal and retention must be identified, measured, and balanced against each other. With its two recent reports—*Dam Removal: Science and Decision Making* and *Dam Removal Research: Status and Prospects*, edited by William L. Graf—the Center hopes to help those charged with these difficult decisions to choose the best course.

*For more information about dam removal, see Dam Removal: Science and Decision Making and Dam Removal Research: Status and Prospects, edited by William L. Graf, both published by The Heinz Center. Single copies of these reports are available free of charge from the Center. Both reports are also available in full on the Heinz Center’s Web site [www.heinzctr.org](http://www.heinzctr.org).*

### To the Editor:

The attractive, informative article on invasive non-native species in the first issue of *Crossroads* highlighted a contradiction in ecological attitudes.

On the one hand, our community worries greatly about fragility and capacity for adaptation.

On the other, we bemoan those notably successful adapters, the invasive species. We customarily study invaders as villains, but we might usefully learn even more from them if we balance our bias.



**Jesse Ausubel**, Program for the Human Environment, The Rockefeller University, New York City

## Q & A: Phyllis Wyeth, Trustee

**P**hyllis Wyeth has been a trustee of the Heinz Center since 2000. She brings to the Center a longstanding and enthusiastic dedication to protecting the environment. In 2002 she was selected by the National Marine Fisheries Service as a NOAA Fisheries Environmental Hero; the honor recognized her development and support of the Herring Gut Learning Center in Maine. She has a particular interest in marine science and aquaculture.

**Crossroads:** Why is the environment important to you? Was there a particular incident or experience that sparked your interest?

**Phyllis Wyeth:** Actually, there was no particular incident—I was brought up by my mother, Alice Mills, to leave the world a better place. She was a founding member of the Piedmont Environmental Council [in Virginia], and she worked to save the Bull Run Mountains from development. I see my mother as a strong role model, and my interest and commitment grew naturally from her example.

**Crossroads:** Which environmental issues do you think are the most important?

**Wyeth:** Air and water quality—and The Heinz Center is right on target on these issues.

**Crossroads:** Why do you choose to support (with both time and funds) the Heinz Center?

**Wyeth:** The Center focuses on the issues that I believe are most important, and the way it involves all four sectors—business, academia, environmental organizations, and government—from the outset makes its findings and recommendations more likely to be accepted. I am really enthusiastic about the four-sector approach! I also enjoy working with the other Board members, and with the staff of the Center, and my experience here has helped me in other areas—for example, when I was working on setting up the board for the Herring Gut Learning Center.

**Crossroads:** Do you believe that the Center’s four-sector approach is particularly valuable?

**Wyeth:** Absolutely—what it does is take the conflict and distrust out of the process so that the results of the project or study can be accepted as unbiased and viable by all sides. The Heinz Center doesn’t offer a “green” solution, or a “business” solution, or an ivory-tower academic solution, but a solution that can be adopted and can work.

**Crossroads:** What other things are you doing and or have you done in this area?

**Wyeth:** I believe strongly in the power of education to help resolve environmental challenges, so one of the activities that’s most important to me is the Herring Gut Learning Center, which has now been running for four years. We involve local middle-school children, teaching them to do aquaculture, for example. We also involve local people on the board of the Center. I believe that aquaculture will help preserve Maine’s traditional fishing communities, which are threatened by the collapse of the fishery. I’m also involved in the preservation of the Brandywine Valley area—my husband’s family has lived there for three generations, and we were happy to be able to protect part of the Brandywine’s watershed by establishing the Point Lookout Wildlife and Water Preserve. We’re working with the Stroud Water Research Center to make the preserve available to schoolchildren here, too. The Brandywine Conservancy and its Brandywine River Museum have also long worked to protect the environment in the Brandywine Valley.

**Crossroads:** What other interests do you have? Is there a connection between these and the environment?

**Wyeth:** Most of my interests revolve around the environment. Just recently, my husband said to me, “I have a hard time painting at the farm [in Delaware] now, because it’s not the real world anymore.” What he meant was that development is encroaching—Wilmington has grown up—and the openness and purity of the countryside has been affected. This saddens me. And it strengthens my commitment to protecting and restoring our environment.

**Crossroads:** Who are your environmental heroes? And villains?

**Wyeth:** My first environmental hero (after my mother) was Jack Heinz—I remember visiting him in his office in the Senate. And Rachel Carson, of course—my mother gave me *Silent Spring* to read when I was very young. I was also inspired by Lois Marie Gibbs, who brought the Love Canal disaster to light.

As for villains, I don’t really care to comment. But I am concerned that current economic policies are undermining the gains of past decades—concerned, but not disheartened.



## World Parks Congress

Protected areas play an essential role in maintaining biodiversity. Indeed, the future of biological diversity on the Earth is linked in many ways to the future prospects for protected areas around the world.

Once every decade, the world community gathers to examine progress at the invitation of IUCN (The International Union for the Conservation of Nature) to examine progress at the World Parks Congress. This year, 2500 delegates met in Durban, South Africa, in September to consider progress, strengths, weaknesses and challenges.

The amount of the planet's terrestrial surface in protected areas has doubled over the last decade to 11.5%. This is a triumph in many ways, but equally



## Heinz Center Friends Make a Difference!

After you have remembered your family and friends during this holiday season, please consider making a gift to future generations by becoming a *Friend of the Heinz Center*. The Heinz Center Friends are a special group of supporters interested in leaving a healthy planet to the next generation by advancing sound environmental policies now. In addition to providing much-needed support, the Friends serve as ambassadors for sound environmental policies in their own communities.

Heinz Center Friends include people of diverse backgrounds and occupations who help support the Center's work. Bringing together business, environmental groups, government, and scholars to address the serious environmental challenges we all face is a hallmark of The Heinz Center. Established in 1995, The Heinz Center is dedicated to continuing the groundbreaking environmental work of Senator John Heinz (1938–1991). Please join us today in carrying on his vision to work together to solve complex environmental challenges.

Our special Friends help spread the word about our work to provide balanced and thoughtful research to improve the scientific and economic foundation for environmental policy. The Friends demonstrate interest and active participation through members-only briefings and seminars by visiting scholars. If you would like to join this dedicated group of supporters, please respond in the envelope provided in this newsletter or contact Anne Hummer, Development Director, at The Heinz Center (202) 737-6307, for more information. All contributions to The Heinz Center are tax-deductible.

impressive is what remains to be done if goals like Zero Extinction are to be achieved. In particular, the challenges of providing real economic benefits to local populations must be met if protected areas are to succeed. Tom Lovejoy represented The Heinz Center on a panel convened to discuss this issue, for which the Center's trademark four-sector approach will be essential.

Developed countries were well represented, among them the United States, which created the world's first national park, Yellowstone, in 1872 (Yosemite was even earlier, but California was a territory when Lincoln set it aside in 1863). More significant, however, was an equally strong and very professional presence from developing nations, and Madagascar and Brazil's State of Amazonas both made major announcements of extensive new protected areas. Equally significant was the presence not only of governments, environmental groups, and academics but also of the world of business. Clearly, four-sector dialogue—as central to this part of the global environment agenda as it is elsewhere—is beginning to be recognized as an effective way to deal with the challenges and opportunities of protected areas.

## People

Trustee and vice chair of the Board **Teresa Heinz** was awarded the 2003 Albert Schweitzer Gold Medal for Humanitarianism at a ceremony on September 23 at The Johns Hopkins University in Baltimore. Mrs. Heinz was recognized for her efforts to protect the environment, to promote health care and education, and to improve the lives of women and children around the world, said the university, which administers the Albert Schweitzer Gold Medal for the Alexander von Humboldt Foundation.

**Laura A. Meyerson** joined The Heinz Center in September as a Fellow and Research Associate. Dr. Meyerson is also a Research Associate at the Smithsonian Institution. Before joining the Heinz Center, she was a AAAS Environmental Fellow at the U.S. Environmental Protection Agency. She earned a B.A. (environmental biology) from the CUNY Baccalaureate program and a master's degree (forest science) and doctorate (ecosystem ecology) from Yale University.

**Bobbie Jo Simmons** joined the Center as a Staff Assistant in October. Ms. Simmons came to the Center from Whitman Associates, Inc., where she was a personnel associate. She received a master's degree in Opera Performance from the University of Maryland in 2002 and a Bachelor of Music in Vocal Performance from the University of North Carolina.

# Heinz Center Program News

## Environmental Reporting

- The Non-native Species Task Group, chaired by **Ann Bartuska**, past-president of the Ecological Society of America, has held three meetings and is now moving toward drafting its report. The report will recommend indicators for inclusion in the **2007 State of the Nation's Ecosystems** report, but will also identify additional indicators that would provide additional detail on specific ecosystem or species types.
- The Landscape Pattern Task Group held its first meeting on October 6–7. This group will take as its starting point the 2002 report's indicators dealing with a variety of landscape pattern and fragmentation issues, with the goal of developing a consistent set of indicators for the 2007 report. The group is chaired by Professor **Norm Christensen**, noted ecologist from Duke University.
- The project's Design Committee, led by **Professor William C. Clark** of Harvard University, met in July to review and refine the project's strategic plan for 2003–2007. (See [www.heinzctr.org/ecosystems](http://www.heinzctr.org/ecosystems) for a copy of the plan.) A key recommendation was to increase the attention paid to ensuring that the report meets the needs and expectations of its intended audience. The Design Committee also recommended focusing on the condition of the overall system of monitoring and data collection that makes national ecosystem reporting possible. Work on refining the indicators themselves, providing annual updates on the Web, and completing the 2007 report also continues.
- Center staff members have presented the report at several conferences and other events. During the summer **Kent Cavender-Bares** spoke at the Water Security in the 21st Century conference, and **Robin O'Malley** made presentations to the Biodiversity and Ecosystems Informatics Working Group (a federal interagency group), the Roundtable on Sustainable Forests (a multisector group), and the Ecological Society of America's 2003 annual meeting. This fall, Mr. O'Malley spoke at the National Research Council's Engineers Forum on Sustainability; the Environmental, Health, and Safety Roundtable (senior managers in major corporations); and a forum on environmental reporting, held at the National Press Club and organized by the Environmental Law Institute. **Tony Janetos** presented the report to a National Academy of Sciences workshop on NSF's NEON initiative.

## Global Change

- The report from the Heinz Center's international workshop on the **status and documentation of rapid land cover and land use change**, cosponsored and supported by the

Millennium Ecosystem Assessment and NASA, is undergoing review by the authors. Professor **Ruth DeFries** of the University of Maryland and Professor **Eric Lambain** of Catholic University in Louvain, Belgium, co-chaired the workshop and are co-authors of the report. The final report will be published by the Millennium Assessment and in abbreviated form in an appropriate journal.

- **Tony Janetos** contributed a paper, "Biophysical Global Changes: A Short Review for Protected Area Managers in the Ecosystems, Protected Areas and People Project," to the World Congress on Parks and Protected Areas. The Ecosystems, Protected Areas and People Project is generating management and policy guidance for governments and protected area managers dealing with large-scale global changes. For more on the Parks Congress, see page 6.
- The National Research Council's Committee for Review of the U.S. Climate Change Science Program Strategic Plan, on which **Tony Janetos** serves, published its first report, calling for substantial changes in the Administration's Strategic Plan. The Committee expects to finish its examination of the Plan in mid-November.
- The Heinz Center plans to hold a symposium on **threshold responses of ecosystems and natural resources to global change**, to document what is known from historical records and provide case studies of potential policy and management responses. A four-sector committee has agreed to steer this project, pending receipt of funding. This symposium will be a first step toward implementing a study of acceptable limits for greenhouse gas concentrations.

## Sustainable Oceans, Coasts, and Waterways

- The **Sharing Innovations in Coastal Zone Management** project held its third meeting on October 28–29, in Washington, D.C. The committee is designing better ways to obtain and share information on innovative approaches in coastal zone management. A final report is due to NOAA in early 2004. A draft report is in preparation. **James Good**, Professor, College of Oceanic and Atmospheric Sciences, Oregon State University, chairs the study.
- The Heinz Center's continuing interest in the issues surrounding dam removal has produced another report. **Dam Removal Research: Status and Prospects**, the proceedings of an October 2002 workshop, was released in September. Edited by **William L. Graf**, Professor of Geography at the University of South Carolina, the new book offers expert insights into the many aspects of a decision on whether or not to remove a dam. See page 1 for more on dam removal.

## Did you know ...

That there may be as many as 2.5 million dams in the United States today, many of them orphaned and outdated? Failure of a dam was responsible for the worst unintentional man-made disaster in American history—the Johnstown Flood of 1889. The environmental effects of dams on streams long outlast the usefulness of the dams, and removal of some dams to restore habitat and rebuild fish populations has become an option. See page 1 for more on dams and dam removal.



## About The Heinz Center

Established in December 1995 to carry on the work of Senator John Heinz (1938–1991), The Heinz Center is a nonpartisan, nonprofit institution dedicated to improving the scientific and economic foundation for environmental policy through multisectoral collaboration. The Center fosters collaboration among industry, environmental organizations, academia, and all levels of government in each of its program areas and projects. It uses scientific and economic analyses to develop viable options to solving problems, and its findings and recommendations are widely disseminated to public and private sector decision makers, the scientific community, and the public. The active involvement of high-level decision makers in government and industry, as well as of leading academic researchers and environmental activists, enables the Center to make a unique contribution to environmental policymaking.

The Center's work currently focuses on three strategic areas: Environmental Reporting; Global Change; and Sustainable Oceans, Coasts, and Waterways.

*Crossroads* is a quarterly publication of The H. John Heinz III Center for Science, Economics and the Environment. The Heinz Center is a tax-exempt 501(c)3 nonprofit organization. *Crossroads* is also available online at [www.heinzctr.org/crossroads](http://www.heinzctr.org/crossroads).

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