Discussion of Challenges Facing Water Management in the 21st Century

Managing water for sustainable use is a complex balancing act that requires significant scientific advice on policy issues, according to experts at a conference, "Water for a Sustainable and Secure Future," held in Washington, D.C. on 25-30 January.

Several speakers called for the need to correct water distribution problems—particularly in developing countries and other regions where many people lack access to clean drinking water and safe sanitation systems—and to re-balance the allocation of water between various human uses, as well as ecosystem needs.

Bruce Babbitt, U.S. Secretary of the Interior during the Clinton administration, said that, while there is no absolute shortage of water in the world, distribution problems arise in many areas because of the lack of efficient use and the inability to price water as a valued commodity.

Babbitt also said that scientists need to help policy-makers draw a "bright line" indicating how much water needs to be left in rivers and other water bodies for the use of natural resources and to maintain ecosystem services. "The real challenge is to get hydrologists, geoscientists, and modelers to address the issue of what are the rational, sustainable boundaries of supply."

Robert Hirsch, associate director for water for the U.S. Geological Survey, said, "Many of us who have had training in water look at a river and ask the question, 'How much water can I get out of this river?' For a reliable supply for a city or industry or agriculture?' That's the old question. The new question is, 'how much water do I need to leave in rivers for the species that depend on that water?' That is one of our greatest challenges."

He stressed the importance of having good scientific information to break gridlocks among different water users about the appropriate balance of water allocation, including in more and regions such as the western United States.

Hirsch outlined a number of key challenges in water management, including the need to have a national assessment of the status and trends of groundwater and surface water use, and the need for improved models and monitoring to understand water availability and use.

Among other concerns, he cited are the scientific uncertainty about the impact of the progressive decline in groundwater in some regions, questions about the effectiveness and potential environmental impacts of aquifer injection storage and recovery, the health impacts of low-concentration compounds, such as hormones and medicines in water, and the emerging issue of changes in hydrology driven by climate change.

Impact of Climate Change

Other speakers also addressed concerns about the potential impact of climate change on water issues. William Graf, professor of geography at the University of South Carolina, agreed that climate change does present some concerns, but he argued that there are more imminent and known threats to water resources: "Climate change is an integral part of what we are going to be facing," he said. "But we have already had 5 times the effects that we might reasonably expect from climate change already installed in the ground. Dams that we have built in this country, which number more than 75,000, in many instances have altered flood peak discharges, for example, by 100%. That is much more of an alteration than we will ever reasonably expect from climatic change. It strikes me that we ought be dealing with problems we know and understand first, and then deal with problems of speculating about what is coming down the pike."

However, Peter Gleick, president of the Pacific Institute for Studies in Development, Environment, and Security, said that one of the most severe consequences of climate change could be its impact on water resources. "The climate cycle," Gleick said, "is the hydrological cycle."

Gleick also called for a "soft path" to water management that includes conservation, new technologies to reduce water usage, and managing resources for human and ecosystem needs. He contrasted the soft path with the "hard path," which he said included the building of inefficient and environmentally damaging dams, levees, and other infrastructure.

In addition, he said he supports proposed U.S. federal legislation that calls for establishing a national water commission, which passed the House of Representatives last fall. He has proposed that such a commission become involved in efforts to protect national water resources, as well as in providing advice on how to help address the global water crisis.

The conference was sponsored by the National Council for Science and the Environment, a non-profit group involved with efforts to improve the scientific basis for environmental decision-making.

—RANDY SHOWSTACK, Staff Writer