Resources Program should move toward monitoring and research of ecosystems and communities and away from its present species-oriented emphasis. The Cultural Resources Program is well organized; the notion of cultural groups should be expanded beyond tribal groups, and the values of ethnographical perspectives and archaeological evidence for adaptive management in the Grand Canyon should be more broadly recognized. The Information Technology Program also appears to be functioning well, although its role could be strengthened through the development of decision support systems for the Center. Research in the Physical Resources Program, framed within a sediment budget model, appears to be operating effectively and is well integrated with the larger Program. The Socioeconomic Resources Program needs to be significantly broadened (beyond recreational and hydropower concerns) and strengthened. Research should be conducted to determine the value of ecosystem features and activities in the Grand Canyon, which should be useful in weighing tradeoffs of future management decisions.

To enable the Center to effectively conduct its monitoring and research activities, the committee recommended that the operational responsibilities within the Adaptive Management Program be reviewed and reconsidered. The Center has been very responsive to stakeholder requests, which may be compromising the Center's ability to conduct monitoring and research. The committee also recommended adding a senior scientist and adaptive management specialist to the Center, along with staff for the cultural, physical, and socioeconomics programs; securing resources to ensure the participation of tribal groups in the Program; and defining criteria for locating the Center in a new "institutional home."

The study was funded by the U.S. Department of the Interior and chaired by James Wescoat of the University of Colorado, Boulder. To order the report, contact the National Academy Press at 800-624-6242 or visit their website at *http://www.nap.edu.*

Identifying Future Drinking Water Contaminants

By Mark Gibson

With a growing population, the use of new and diverse chemicals that can enter the water supply, and the emergence of new microbial pathogens, the U.S. federal government is faced with a regulatory dilemma: where should it focus its attention and limited resources to best ensure safe drinking water supplies for the future? The availability of increasingly powerful analytical methods for the detection and identification of small amounts of chemicals and microorganisms in the environment complicates these decisions. A new report from the WSTB *Identifying Future Drinking Water Contaminants* should help ensure that drinking water contaminants, especially new and emerging ones, are identified and that their health risks are appropriately addressed.

1996 amendments to the Safe Drinking Water Act require the U.S. Environmental Protection Agency (EPA) to publish, every five years, a list of unregulated chemical and microbial contaminants that are known or anticipated to occur in public water systems and that may pose human health risks. The first such list, the Drinking Water Contaminant Candidate List (CCL), was published in March 1998. Every five years, the EPA must decide whether to regulate at least five new contaminants from the CCL. Because additional research and monitoring need to be conducted for most of the contaminants on the current CCL, the CCL can be used to help prioritize research activities.

At the EPA's request, WSTB and BEST jointly formed the Committee on Drinking Water Contaminants to help the EPA develop and use the first and successive CCLs in a scientifically defensible manner. Specifically, the EPA asked the committee to accomplish three related tasks: (1) develop a scientifically sound approach for deciding whether or not to regulate contaminants on current and future CCLs, (2) convene a workshop focusing on emerging drinking water contaminants and the database that should be created to support future decision-making on such contaminants, and (3) outline an approach for developing future CCLs.

The committee's first report, *Setting Priorities for Drinking Water Contaminants*, provides a phased decision-making process for determining which contaminants on a CCL are appropriate candidates for regulatory decisions and which will require additional research or monitoring. (It is summarized in the November/ December 1998 issue of the WSTB newsletter.) *Identifying Future Drinking Water Contaminants* addresses the second and third topics and is based on a series of presentations and subsequent committee deliberations that occurred at a December 1998 workshop on emerging drinking water contaminants. At the workshop, a dozen papers were presented on emerging microbiological and chemical drinking water contaminants, associated analytical and treatment methods, and existing and proposed environmental databases for their proactive identification and regulation.

Following the presentations, the committee developed a consensus-based approach and related recommendations for the creation of future CCLs. Due to the limited time available for committee deliberations, the recommended approach for the development of future CCLs is a conceptual, two-step process. Under this two-step approach, the "universe" of potential contaminants derived from a wide variety of sources would first be combined and culled using simple criteria and expert judgment to prepare a "preliminary CCL" (PCCL). (In this regard, the committee recommends that the EPA

evaluate several types of related potential drinking water contaminants that were not considered for inclusion on the first CCL, such as pharmaceuticals, biological toxins, and fibers.) Next, the PCCL would be processed, using more information in conjunction with a quantitative screening tool and expert judgment, to prioritize which contaminants should be listed on the CCL. The process would be repeated for each CCL development cycle to account for new data and contaminants that are identified over time. In addition, all contaminants that have not been regulated or removed from the existing CCL would be automatically retained on each subsequent CCL. As in the previous report, the committee recognized the need for EPA policy judgments, which cannot and should not be removed from the CCL development process.

The report was written by the Committee on Drinking Water Contaminants and chaired by Warren Muir, formerly of the Hampshire Research Institute, now Executive Director of NRC's Commission on Life Sciences. Funding for the report was provided by the EPA's Office of Ground Water and Drinking Water. To order a prepublication copy of the report, contact the National Academy Press at 800-624-6242, or *http://www.nap.edu*.

UPDATE: CURRENT PROJECTS

Riparian Zones: Functions and Strategies for Management

The joint WSTB/BEST study of the functions of riparian zones and strategies for improved management of these areas will hold its first committee meeting in early fall 1999. Unlike wetlands and waterbodies, riparian zones are not specifically regulated. And because they are frequently well oxygenated, they do not qualify for categorization as wetlands. This study will describe the nature and functions of riparian zones and assess the condition and trends of riparian habitats with respect to water quantity and quality. It will also review criteria for the improved management of riparian lands and for mitigation of impacts on such habitats by identifying conflicting policies or objectives and suggesting methods for resolving them. Funding has been secured from EPA, USGS, USDA, the Bureau of Reclamation, and the National Science Foundation (NSF). The study is likely to include four meetings over 18 months. The committee is currently being formed and should be approved by the NRC at the end of July. For further information, contact study director Laura Ehlers at 202-334-3422 or *lehlers@nas.edu*.

Committee on Drinking Water Contaminants

The joint WSTB/BEST Committee on Drinking Water Contaminants is beginning a second phase of study that will extend through September 30, 2000. EPA's Office of Ground Water and Drinking Water has requested that the committee develop and recommend a process to prioritize potential drinking water contaminants (chemical and microbiological) for inclusion on future Drinking Water Contaminant Candidate Lists. The process will include a simple, semi-quantitative prioritization tool as recommended by the committee in their first two reports, *Setting Priorities for Drinking Water Contaminants* and *Identifying Future Drinking Water Contaminants*. In addition, the committee will provide further guidance on the development of mechanisms for grouping related microbial contaminants into categories for research and regulation. The committee was chaired by Warren Muir, founder and president of the Hampshire Research Institute and now executive director of the NRC Commission on Life Sciences. A new chair is currently being selected. For more information, contact Mark Gibson at 202-334-3422 or *mgibson@nas.edu.*

Studies in Hydrologic Science

Early in 1999, a new standing activity was launched by the WSTB in cooperation with the NRC's Board on Atmospheric Sciences and Climate. The Committee on Hydrologic Science, with support from USGS, NASA, NOAA and NWS, NSF, and the Army, will review and provide advice on scientific activities of U.S. federal agencies and U.S. contributions to international programs in hydrologic science including research, observation systems, and data collection. The NRC hopes to help assure the best and most appropriate hydrologic input to U.S. and international programs with hydrologic components and guide the proper development of the field of hydrologic science to be of maximum value to the national and international scientific enterprise.

After two meetings, the committee has drafted its first report, which focuses on hydrologic science priorities in global change research. The report is currently undergoing external review and should be published by mid-August. The report will be the subject of briefings and serve as a basis for planning future activities at the committee's next meeting, to be held in Washington DC on September 9-10, 1999. Dara Entekhabi of the Massachusetts Institute of Technology chairs the committee. For information, contact WSTB director Stephen Parker at 202-334-3422 or *sdparker@nas.edu.*

Optimizing Water and Wastewater Service: Public and Private Models