Henry J. Vaux, Jr.
Director, UC Water Resources Center

California's Long Drought

Despite near-normal levels of rainfall in many regions of the state during 1991–92, California remains in the grip of a 6-year drought. With the water year now essentially over, statewide runoff for 1991–92 appears to be 50% of normal. The Department of Water Resources has classified the year as "critically dry."

Although runoff is 15% lower than last year, reservoir levels provide one bright spot. Storage now totals about 70% of average for this time of year, as compared with 65% last year. This small advantage may be lost, however, because the snows that feed our reservoirs have melted earlier this year than last. Thus, the situation appears to be only slightly better than it was a year ago. Some additional relief could come in the form of lessons learned in managing last year's drought. The willingness of urban water consumers to conserve water turned out to be far greater than planners had anticipated, for example. The success of the State Water Bank demonstrated the efficacy of an entirely new strategy for managing drought.

Some selected areas of the state — Santa Barbara is one example — did benefit directly from higher-than-normal levels of precipitation. These specific instances should not obscure the basic water supply facts of 1991–92 for the state as a whole, however. It will take several years of normal or above-normal precipitation to restore reservoir storage statewide to predrought levels. A critically dry year in 1992–93 could put the state in a very severe water-short situation. Californians, then, must recognize that the drought is not over, and must continue to economize on water use.

Even in the postdrought era, it will remain just as important to recognize that California is confronted with a long-term scarcity of water. Population growth continues to increase the urban demand for water. Public preferences for the environmental amenities associated with water have intensified. Concerns for endangered species and efforts to preserve white water for recreation are only two manifestations of the public interest in the environment. Agricultural water use is not expected to grow, but it is likely to remain relatively constant and to continue to account for about 75% of the use of the state's developed water supply.

These competing demands for water will continue to strain what are essentially fixed sources of supply. Concerns about the deterioration of water quality are also mounting. If deterioration trends do not change, water supplies available to meet future demands could be reduced even further, thereby intensifying water scarcity.

The University of California is at the heart of research to develop the new technologies and institutions needed to cope with future water scarcity. Groups such as UC's Water Resources Center and the Salinity and Drainage Task Force support advanced research on both technology and improved management regimes. Some 400 researchers on all nine UC campuses are searching for more efficient ways to manage both water quality and water supplies.

Ironically, even as water has emerged as one of the most critical problems for Californians, organized research activities at the University, including water resources research, have suffered a permanent funding reduction of 10% during the past 2 years. By diminishing this support for water research, we can almost guarantee that the development of technical and managerial innovations that might help solve long-term water problems will be slowed, or even stopped altogether. To be sure, many pressing public needs are either underfunded or unfunded in today's stringent fiscal environment. Yet when ensuring an adequate water supply ranks only behind crime as a critical concern of California's citizens, this seems a particularly inauspicious time to reduce funding for water resources research.

Many agricultural researchers have been able to offset reductions in state support by using external funds from a variety of public and private agencies. These funds are given with the expectation that the research they support will focus on immediate water problems. However, if this emphasis on immediate problems continues, the University's research program will be focused increasingly on near-term water problems at the expense of the basic research needed to identify and solve the water problems of the future.

By its nature, research often takes many years to bear fruit. For example, before World War II, the arcane field of quantum physics had few technological payoffs. Scientists working in the field were motivated primarily by "aesthetic considerations and the pursuit of truth." However, in a relatively short period during and after the war, quantum physics became the basis for a number of astonishing innovations, including transistors, semiconductors, nuclear energy and lasers. The payoffs from research are virtually never predictable, yet they may make contributions to human welfare out of all proportion to the relatively modest investments required. In agriculture, scientists ultimately used the laser to develop techniques for dead-leveling irrigated fields, which resulted in substantial savings in agricultural water use.

The history of California suggests that the state will continue to be plagued with water problems. Our capacity to maintain and enhance the economic and environmental vitality of California in the future will depend in part on the basic water research that we do now. If public funding for that research continues to decline, the water problems of tomorrow may prove even more daunting than those of today.