

WATER SUPPLY AUGMENTATION AND CONSERVATION

The research and development program is devoted to improving the water supply situation by either increasing available supplies or conserving existing ones. Activities include research in reservoir evaporation reduction and research involving control of phreatophytes and aquatic weeds. Reducing evaporation loss is vital for water supply conservation—average annual evaporation from large lakes and reservoirs in the 17 Western States alone is estimated at over 14 million acre-feet. Also, control of water-wasting weeds and obnoxious aquatic plant growth by mechanical, chemical, and biological means can significantly increase water yield.

In the Bureau of Reclamation, where evaporation reduction research is largely performed, the program objectives are to find the most suitable materials for evaporation retardants, to develop practical methods for applying these materials to large water surfaces, and to develop reliable techniques for determining evaporation savings. Reclamation believes that these savings can well mean the extension of irrigation to new areas, reevaluation to a feasible status of some projects deficient in water, and increased power revenues. A recent development in the Reclamation program involved the testing of a device using a laser-beam light source for measuring evaporation rates from reservoirs.

Weed control research, also conducted largely by Reclamation, consists of laboratory and field studies of aquatic weeds, phreatophytes, herbicides, algacides, soil sterilants, pesticides, and emulsifiers. Included are field-scale applications of herbicides and field trials of mechanical eradication devices. A recently developed atomic measuring method is used as an aid in regulating dosage rates of certain algacides used to control weeds in canals and waterways.

HYDRAULICS AND ENGINEERING WORKS

This program encompasses research and development activities in hydraulics, concrete, materials technology, open and closed conduits, soils engineering, and structural and rock mechanics. Research is focused on design of water control structures, on materials used in these structures, and on improved methods of construction, operation, and maintenance. Since water resource structures are growing rapidly in number, size, complexity, and cost, the research is directed toward improved economy, efficiency, and safety of these works.

Research is performed to solve structural problems; to make best use of concrete and its constituents; to investigate hydraulics problems by studies of dams, spillways, outlet works, canals, pipelines, gates, valves, water measurement devices, and flow in aquifers; to investigate soil embankments and foundations; to develop protective coatings and bituminous materials; to solve corrosion problems and develop techniques for cathodic protection of metals; and to develop special techniques for chemical and physical analyses of materials and for application of radioisotopes.

The Bureau of Reclamation, which conducts most of these activities, defines several areas of technology offering great promise: Location of underground cavities by a new seismic method; performance of rock mechanic tests in remote areas utilizing lightweight portable equipment; incorporation of earthquake and high-pressure forces in soils testing; development of a mobile nuclear laboratory for field studies of flow rates in underground aquifers and through turbines; design of a dual-purpose salmon spawning and water conveyance portion of the Tehama-Colusa Canal; use of "instant X-ray" to detect breaks in transmission lines; and development of an "earthquake simulator" for more realistic design of structures subject to earthquake forces.

GRANTS FOR TRAINING PROFESSIONAL MANPOWER IN NATURAL RESOURCES

The research and training grant programs of the Department of the Interior assist institutions and individuals in specialized training relating to water resources management and water pollution control. The objective of these programs is to increase the Nation's resource of professionally trained manpower for scientific, technical, and management positions.

There is a shortage of information needed to solve many varied and complex problems in water quality and quantity. The support of professional and technical training in educational institutions is necessary to assure the professional personnel required.

The benefit of these programs is to strengthen the academic capabilities of educational institutions for specialized training in the field of water resources