

ARIZONA WATER RESOURCES NEWS BULLETIN

NEWS BULLETIN 75-4

JULY-AUGUST 1975

ARIZONA WATERSHED SYMPOSIUM

The 19th Annual Arizona Watershed Symposium will be held September 24, 1975, at the Desert Hills Motel in Phoenix. The Symposium, cohosted by the Arizona Water Resources Committee and the Arizona Water Commission, is open to the public. This year's program promises to be interesting, although it will be hard to match last year's landmark event. The tentative program is as follows:

The Arizona State Water Plan. Thomas C. Clark, Deputy Director, Arizona Water Commission, Phoenix.

Flagstaff Clear Creek Dam, Surface Water versus Wells. Charles K. McClain, City Manager, Flagstaff.

Arizona's Frozen Assets:

Snow Pack Measurement and Space-Age Technology. Herbert Schumann, Hydrologist, United States Geological Survey, Phoenix.

Snow Pack Management. Dr. David Thorud, Director, School of Renewable Natural Resources, and Associate Dean, College of Agriculture, University of Arizona, Tucson.

Volumetric Forecasts from Snow Pack Measurements. Ted Wilson, Head Engineer, Hydrology Department, Salt River Project, Phoenix.

A Sportsman Views Watershed Management. Speaker to be announced.

Watershed Management's Effect on Many Resources. Dr. Peter F. Ffolliott, Associate Professor, School of Renewable Natural Resources, College of Agriculture, University of Arizona, Tucson.

The Woods Canyon Project; Biggest Single Experiment Ever in Arizona's Watershed Management. Ross Carder, Project for Watershed Management Research, Rocky Mountain Forest and Range Experiment Station, Flagstaff.

Chaparral Management — Its Potential, Its Problems, Its Future. Jack Dieterich, Project Leader for Fire Research, Rocky Mountain Forest and Range Experiment Station, Tempe.

Economic Impact of Water — Our Most Reused Resource. J. Robert White, President, Arizona Water Resources Committee, Phoenix.

The luncheon speaker will be John McGuire, Chief, U.S. Forest Service.

Call Philip Briggs at 258-8175 for further information.

PUBLICATIONS RELEVANT TO ARIZONA AVAILABLE

State Water Plan

In July 1975 the Arizona Water Commission completed Phase I of the Arizona State Water Plan, titled *Inventory of Resource and Uses*.

This report represents the first of three phases in the development of a State Water Plan for Arizona. Its 230 pages contain an evaluation and tables of data collected by reliable sources throughout the State. Narrative sections cover the occurrence of surface water and ground water in Arizona; historical and legal background; 1970-base water supplies and uses in the State; flood control; water data programs, and problems and needs in water resources.

A more detailed summary of the Phase I report will appear in Water Resources Project Bulletin No. 11, to be issued soon.

Water/Energy Proceedings

Anyone who did not attend the regional water resources symposium entitled "Water Requirements for Lower Colorado River Basin Energy Needs" and wishes to receive a copy of the Proceedings for \$10.00, may do so by contacting Dr. Ken Foster (editor), Office of Arid Lands Studies, University of Arizona, 845 North Park Avenue, Tucson, Arizona 85721 (Telephone: 884-1955).

Soil Survey

The U.S. Department of Agriculture Soil Conservation Service, in cooperation with the University of Arizona Agricultural Experiment Station, has recently published a *Soil Survey of Apache County, Arizona, Central Part*. The publication provides useful information to farmers, ranchers, engineers, and scientists as well as newcomers to Apache County. Information such as use and management of soils, range management and plant types, soil properties and engineering test data, and classification of soils is provided in this informative report, which was prepared by Mack L. Miller and Kermit Larsen of the SCS.



ARIZONA WATER COMMISSION • WATER RESOURCES RESEARCH CENTER
OFFICE OF ARID LANDS STUDIES



Annual Report on Surface-Water Supply in Arizona Released

A compilation of surface-water records of the discharge and stage of streams, diversions, and return flows, as well as the contents and stage of lakes and reservoirs in Arizona, has been prepared by the U.S. Geological Survey (USGS). The report was prepared in cooperation with other federal, state, county and municipal agencies together with other organizations.

As is common in Arizona, streamflow varied greatly in the 1974 water year, from month to month throughout the year and from place to place in the State. Streamflow generally was deficient for the 1974 water year, and only July had flows appreciably above median. In contrast, in 1973 streamflow was generally excessive.

Storage decreased in most major reservoirs during the 1974 water year. Diversions of streamflow for irrigation of Arizona lands during the 1974 water year totaled 3,270,000 acre-feet, slightly less than in 1973.

The report is entitled "Water Resources Data for Arizona, 1974, Part 1. Surface Water Records." Copies of the report are available for examination at the USGS offices in Room 5A, Federal Building, 301 West Congress Street, Tucson; Suite 1880, Valley Center, Phoenix; Building 3, 601 East Cedar Avenue, Flagstaff; 1940 South Third Avenue, Yuma; and Room 5312, National Center, 12201 Sunrise Valley Drive, Reston, Virginia.

USGS Compilation of Miscellaneous Measurements

The Arizona District, Water Resources Division of the U.S. Geological Survey (USGS), has recently completed a compilation of all discharge measurements made (by the USGS) at points other than gaging stations through 1973. The report brings together in one place measurements published previously in bulletins, circulars, and water-supply papers, as well as a selection of previously unpublished measurements and seepage investigations.

The report was two years in preparation, is quite extensive, and understandably voluminous. All measurement sites are numbered in downstream order, and are included in a table of contents which shows the tributary (or distributary) relations. Many of the locations of measurements made in earlier years were very poorly described. These were plotted on a 1:1,000,000 scale map and the latitude and longitude calculated to the nearest minute only. The remainder of the measurements are located to the nearest second, as well as by the normal river mileage and/or land survey description. Measurements at several sites within a reach of stream have been included under the same listing when the flow was essentially equivalent.

No attempt was made to correlate flows with discharge at continuous-record gaging stations. However, discharges at gaging stations are listed whenever the measuring site was reasonably close to a station.

The report will be updated periodically. Copies are available for inspection at the USGS offices in Tucson (Room 5 A Federal Building, 301 West Congress Street), and Phoenix (Room 5017 Federal Building, 230 North First Avenue), and at the office of the Arizona Water Commission (Suite 800, 222 North Central Avenue, Phoenix).

NEW HYDROLOGY HEAD AT UNIVERSITY OF ARIZONA

A nationally renowned geologist and hydrologist, Dr. Stanley N. Davis, has been appointed head of the University's Department of Hydrology and Water Resources. He replaces Dr. Dan Evans, who will be dedicating more time to research and teaching.

Dr. Davis received a B.S. in Geology at the University of Nevada in 1949, an M.S. in Geology from the University of Kansas in 1951, and a Ph.D. from Yale University, also in Geology, in 1953. Since that time, he has held numerous teaching and administrative positions at the University of Rochester, Stanford University, University of Missouri (Columbia), and Indiana University. He has also done short-time work for the U.S. Bureau of Reclamation, Arctic Institute of North America, Bowling Green University, Princeton University, University of Hawaii, the Atomic Energy Commission, and others.

Dr. Davis' interests lie in groundwater development, its chemical and thermal characteristics, water pollution, and engineering geology and geomorphology. He is the author or coauthor of over 50 technical papers, is a member of numerous scientific societies, and serves on many national boards and committees. He has spent a total of 13 years abroad, has taught at the University of Chile, Oriente University (Venezuela), and University of the Andes (Venezuela), has lectured for UNESCO in Brazil, and has been a consulting professor in Spain for a number of years.

THREE-STATE WATER INFORMATION PROGRAM

Approval has been received for a program designed to coordinate certain research information activities in the Lower Colorado River region. The program proposal was prepared by the Water Resource Institutes of Arizona, California, and Nevada, at the request of the Lower Colorado River Management Program Coordinating Committee.

Funding for FY75-76 has been provided by the U.S. Office of Water Research and Technology, the U.S. Bureau of Reclamation, and the three Lower Basin states. The immediate objectives of the program will be to facilitate exchange of results of recent and ongoing water resources research in the region, making use of existing water data and information systems in each state. Progress of the program will be reported periodically in the News Bulletin.

OFFICE OF ARID LANDS STUDIES MOVES TO NEW QUARTERS

The OALS has moved its offices into the newly formed Arid Lands Information Building at 845 North Park in Tucson. This location is one block north of the University of Arizona main gate. Office space for the Water Information Section of the Water Resources Research Center will also be in the same location. One of our Newsletter editors will be housed there to receive calls and maintain a display of recent water related materials for public viewing.

The editors would like to extend an invitation to all our readers to stop in whenever convenient.

SOIL COLUMNS FOR REDUCING VIRUS

Experiments with soil columns at the U.S. Water Conservation Laboratory indicate that sand from the Salt River bed has a tremendous capacity to adsorb viruses from sewage water. Dr. Clarence Lance of the U.S. Water Conservation Laboratory, and Dr. Charles Gerba of the Department of Virology and Epidemiology of the Baylor College of Medicine, Houston, Texas, are cooperating on this project.

A virus suspension (polio LSc) was mixed with a secondary sewage effluent from the Phoenix treatment plant to provide an added virus concentration of 3 to 5×10^4 plaque-forming units (PFU)/ml in water applied to two columns on a schedule of 9 days flooded alternated with 5 days dry. Viruses were applied during three flooding cycles. Two to five ml samples were extracted daily from ceramic samplers at depths of 2, 5, 10, 20, 40, 80, 160, and 240 cm and from the outlet line (250 cm). A 100 ml sample was taken of each day's cumulative outflow. All samples were frozen and shipped by air freight to Houston, Texas, for the virus assays.

The virus concentration in the sewage reservoir dropped from 3 to 5×10^4 to about 3 to 5×10^3 PFU/ml during the 1- or 2-day period before a fresh suspension of virus in sewage water was prepared. The lower concentration was used in calculating the percent virus removal by the soil columns to eliminate virus die-off in the reservoir from the removal estimates. During the first 2 cm of travel through the soil, 90% of the viruses were removed by one column and 67% by the other. The infiltration rates for the columns were 50 to 60 and 14 to 16 cm/day, respectively. The viruses appeared to move to about the same depth in the two columns. Thus, decreasing the infiltration rate apparently did not increase virus removal.

Viruses were detected in 1 ml samples on only 3 of 43 sampling dates at the 160 cm level and were not detected at the 240 and 250 cm levels. Viruses were detected in 100 ml samples of the daily cumulative drainage from the columns on 5 of 43 sampling dates. Thus, 4 to 5 log removals of virus were achieved by the soil columns.

PHOENIX TO CONSERVE STORM WATER

The Phoenix Urban Study was recently begun by the U.S. Army Corps of Engineers, the Maricopa Association of Governments, and other federal, state, and local agencies. One of the planning objectives to be considered in detail by the study is that of water conservation through recharge of storm runoff.

In order to be responsive to the needs and desires of all concerned citizens and agencies, a technical committee is being formed. The committee will be composed of various federal, state, and local interests, together with private citizens. This Water Conservation Technical Committee will help identify the data, experience, and expertise available and will periodically meet to review the Corps' progress and provide guidance for achieving planning objectives.

UA PROFESSOR ONE OF FIVE WATER DESALTING EXPERTS TO ASSIST BUREAU OF RECLAMATION

Five water desalting experts have been appointed to provide technical assistance in designing the world's largest desalting plant, to be constructed by the U.S. Bureau of Reclamation near Yuma, Arizona.

The plant, authorized by Congress a year ago in a program designed to provide a permanent solution for improving the quality of Colorado River water delivered to Mexico, will treat up to 104 million gallons per day of saline agricultural drainage water in southwestern Arizona and put most of it back into the Colorado River for delivery to Mexico's Morelos Dam.

The five individuals are all recognized experts in the water treatment field, and will assist the Bureau in selecting the best possible system for the Yuma plant. They are:

Dr. Raymond A. Sierka, Professor of Civil Engineering and Engineering Mechanics, University of Arizona, Tucson. Dr. Sierka, who holds a Ph.D. in Sanitary Engineering from the University of Oklahoma, has broad experience in reverse osmosis desalting techniques, as well as in other advanced desalting processes. He has published a number of articles on water and wastewater treatment.

Dr. Kurt S. Spiegler, Professor in Residence at the University of California's Sea Water Conversion Laboratory at Berkeley. Dr. Spiegler holds five patents relating to membranes and other aspects of water desalting, and has wide experience in all water purification processes. He holds a Ph.D. in chemistry from Hebrew University, Jerusalem.

Joseph Finke, Manager, Nuclear Desalting, Space and Defense Department, Kaiser Engineers, Oakland, California. Mr. Finke has been responsible for research, design, and fabrication of desalting facilities for U.S. government agencies, private industry, and foreign nations. He holds a master's degree in chemical engineering from Columbia University.

Alfred N. Rogers, Engineering Specialist, Bechtel Corporation, San Francisco. Mr. Rogers has a master's degree in chemical engineering from Lehigh University, and has had 20 years' experience in the design of water treatment systems; he is responsible for designing Bechtel's water desalting and wastewater treatment plants.

Melvin E. Mattson, Membrane Process Specialist, Office of Water Research and Technology, U.S. Department of the Interior. Mr. Mattson is a specialist in electrodialysis desalting processes, and has broad experience in evaluation of membrane systems, including pretreatment requirements. His past experience includes management of membrane desalting test facilities and evaluating plant performance. He is a graduate of the U.S. Merchant Marine Academy and George Washington University.

EVALUATION RESULTS

Of the 900 evaluation sheets sent out with the May/June News Bulletin, 115 were completed and returned. About 75% of the respondents were affiliated with universities or federal, state, and local governments. Additional brief comments on stories or article summaries relevant to Arizona would be preferred by 81% of those returning the forms, while 78% would like to see more news about specific governmental agency action relevant to water. Sixty-six percent are interested in descriptions of existing or pending legislation in each issue.

The News Bulletin will continue to be published bimonthly with as much information related to the above topics as possible. The editors wish to thank all those who contributed to this evaluation.

Please address your news items or comments on the News Bulletin to any of the four editors:

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