

# RIZONA WATER & RESOURCES NEWS BULLETIN

NEWSLETTER NO. 73-2

SEPTEMBER-OCTOBER 1973

## ARIZONA WATER PROJECTS ON COMPUTER FILE

A vital part of the Arizona Water Information System program has been the cataloging of water resources projects conducted within the State of Arizona. To date over 1,000 projects have been identified and placed on computer file for retrieval. Each project has the following information available for retrieval:

- Title of Project
- Principal Investigator
- Supporting Agency
- Summary of Proposed Work
- Publications from Research Project
- Data Availability

This information can be accessed by key words, county, river basin, and/or range — township. Should you desire information regarding past or present water related projects in your geographical area, contact:

Kenneth Foster  
Office of Arid Lands Studies  
1201 East Speedway  
Tucson, Arizona 85719  
Phone: (602) 884-1955

This service is free of charge.

## LOCAL GOVERNMENTS MUST DESIGNATE FLOODPLAINS

Arizona Revised Statutes 45-2342, effective August 8, 1973, require counties and incorporated cities and towns to designate floodplains within their area of jurisdiction and regulate development within them.

The local governing body, referred to in the act as the floodplain board, is required to adopt floodplain regulations relating to the use of land and construction within floodplains, defined as the channel and relatively flat or low lands adjoining the channel of a watercourse which may be subject to flooding. These regulations must include establishment of minimum flood protection elevations and flood damage prevention requirements. Within 180 days after the effective date of the act, the law requires floodplain boards to delineate these floodplains where development is ongoing or imminent, according to the criteria established by the Arizona Water Commission.

## ARIZONA WATER COMMISSION ADOPTS FLOODPLAIN DELINEATION CRITERIA

On October 5, 1973, the Arizona Water Commission adopted its criteria and procedures for the delineation of floodplains and distributed a copy to each local government within Arizona. In recognition of the nature of the problem, and of the needs arising from the enactment of the new Statutes, the Commission has adopted criteria which allow the use of existing and future delineations of the 50- and 100-year floodplains performed under the various federal programs, but also provide a simple, rapid, uniform, and adequately accurate method for use by floodplain boards in making new delineations.

The criteria outline three principal steps in the delineation of floodplains:

1. Determination of the peak discharge for the reach of stream under study.
2. Determination of the water surface profile for the reach of stream under study.
3. Preparation of a floodplain map showing flood elevations and the area inundated.

The criteria specify the methods and standards to be employed in performing the above three steps, while the details of the procedures of most of the specified methods are contained in referenced source material.

Questions on the delineation of floodplains should be directed to the local government; questions on the criteria, or requests for copies of them, should be directed to the Commission at 258-8175, Phoenix.

## ARIZONA STATE LAND DEPARTMENT POLICY: GEOTHERMAL LEASES

In May of this year, the State Land Department issued its first geothermal lease by direct application to Reed Nix of Globe, Arizona, on a section of State Land near Indian Hot Springs, East of the Town of Fort Thomas. By Department policy, all lands for geothermal leases were thereafter withdrawn to be released through competitive bidding. An extensive and exhaustive study was made possible by the Department of Geosciences (Geophysics Division) led by Dr. John R. Sumner and by the Office of Arid Lands Studies represented



by Dr. Larry Lepley of the University of Arizona. Dr. Wesley Peirce of the Arizona Bureau of Mines fulfilled a very important role in geological interpretation and editorializing the material as it was produced. The Department of Geosciences and Office of Arid Lands Studies conducted their work separately. When combined for comparison and agreement on final designation of areas, the areas of highest geothermal potential were very closely aligned.

Mr. A.K. Doss, Director of the Mineral and Energy Division of the Land Department who will have much to gain from this study, states, "This use of ERTS imagery in this study and the precise interpretation that can be made from space photography will surely lend greater credence to the art and science of space photography interpretation." Mr. Doss further stated that studies of this nature will in all probability have future impact on how the State Land Department will approach certain types of potential mineral and energy areas on State land.

#### **USDA SANTA CRUZ - SAN PEDRO RIVER BASIN (TYPE IV) STUDY**

Multiple land use objectives are being examined under a "Type IV" study of the Santa Cruz and San Pedro River Basins of southern Arizona. According to the guidelines established by the President's Water Resources Council, land use alternatives will be evaluated that will best achieve the multiobjectives of national economic development and environmental quality. In achieving these goals, resources and land uses are investigated for opportunities for improving output of goods and services at national and regional levels through flood, erosion and sediment controls; improved drainage; improved production of good quality water; increased production from crop, range and forest lands; enhancement of recreation, fish and wildlife resources; and maintenance of a high level of employment. Desired environmental qualities to be achieved include open space, clear lakes, attractive mountain parks and wilderness areas, enhanced wildlife habitat, clear air, clean water, litter-free and unscarred landscapes, and culturally attractive historic and archeological sites.

Planned for completion in December 1974, the final report will call attention to critical land-use problems and identify corrective treatments in the Santa Cruz and San Pedro River Basins. The Santa Cruz-San Pedro River Basin Study geographically includes the southeastern portion of the state bounded by the Mexican border on the south, the Gila River on the north, the Chiricahua and Graham Mountains on the east, and the Baboquivari Mountains and Santa Rosa and Vekoi Washes on the west. In addition to flood, sediment, and erosion control needs commonly associated with agricultural communities, there will ultimately be a critical need to restore grassland vegetation to present cropland areas that become abandoned for lack of irrigation water because of falling groundwater levels. Abandonment of speculative real estate developments because of inadequate water supplies will no doubt require restoration of denuded and eroding crossroads. Problems of sediment and chemical pollution of drainages associated with termination of past mining and milling operations will continue to require corrective treatments and beautification as mining activities continue to expand in the river basin area.

Under the leadership of Mr. Dennie Burns, Soil Conservation Service, Phoenix, the broad coverage of the investigation is conducted by Messrs. Ron Clark (economist), Don Clarke (geologist), Mack Miller (soil scientist), Harry Millsaps (hydrologist), and John Weaver (engineer), all SCS scientists. The USDA study team also includes Dr. Aaron Nelson of the Economic Research Service and Mr. J.F. Arnold, Forest Service ecologist. Although state participation involves many people of other agencies, coordination of all activities is achieved by the professional employees of the Arizona Water Commission under the direction of Mr. Wesley Steiner, Executive Director.

Inquiries relating to the study may be addressed to Mr. Burns at the Arizona Title Building, Suite 326, 111 W. Monroe Street, Phoenix, or by calling (602) 261-4031.

#### **1970 LABOR DAY STORM REPORT**

Recently published (U. of A. Agricultural Experiment Station Technical Bulletin 202) is a report by David B. Thorud and Peter F. Ffolliott on the 1970 Labor Day weekend storm in Arizona, titled *A Comprehensive Analysis of a Major Storm and Associated Flooding in Arizona*. The 1970 Labor Day weekend storm caused more loss of human life than any other storm in Arizona's recent history. In addition, many dwellings, roads, bridges, and other structures were damaged by record flooding. This final report is an overall collation of reports and data summaries prepared by federal, state, and local agencies and organizations concerned with the storm and its consequences in Arizona. The storm is analyzed as a meteorological event and a hydrologic event, and resulting damages to human, cultural, and natural resources are documented. There is a small section on hydrologic responses to various land management practices. The authors suggest a need for improving the emergency warning systems concerned with immediate flood hazards in remote, high-use localities.

Requests for copies of this report should be addressed to the University of Arizona, Agricultural Experiment Station.

#### **NATIONAL WATER COMMISSION REPORT**

The National Water Commission, which was established in 1968 to study present and anticipated national water resources problems and make recommendations for future water policy, transmitted its final report to the President and to the U.S. Congress on June 14 of this year. Copies of the report are available through the Superintendent of Documents, U.S. Government Printing Office, stock number 5248-00006, at a price of \$9.30 postpaid or \$8.75 at the GPO bookstores.

At its June 28 meeting, the Commission gave its final approval to a summary report which has been submitted to the President and Congress. The summary, a 200-page report which is an abbreviated version of the Commission's full report, includes the verbatim conclusions and recommendations from the main report. It has been printed and is available through the Government Printing Office.

With the closing of the Commission's offices, communications in connection with further action on the report and recommendations should be addressed to the U.S. Water Resources Council, 2120 L Street, N.W., Washington, D.C. 20037, telephone (202) 254-6453, or to the House or Senate Committees on Interior and Insular Affairs, to which the report has been referred.

Speaking at the Universities Council on Water Resources Annual Meeting (see Newsletter No. 73-1), Commissioner Ray K. Linsley said that the seven basic themes of the final report are:

1. Future increasing demands for water are not inevitable, but are very much in the control of society through its policies.
2. Regarding national policies, we should shift from water development to protection of water quality.
3. Water use and land-use planning should be very closely coordinated.
4. We should conserve our water supplies.
5. Sound economic principles should be the key to project evaluation.
6. It is time to review and update water laws, both federal and state.
7. Development and management of water supplies should take place at the lowest capable level of government.

If all of the 240 recommendations are fully adopted, it would result in:

1. Removing the federal government largely from traditional functions such as flood control, etc.
2. Slowdown or termination of construction projects.
3. Major changes in federal and state law.
4. Emphasis on planning.
5. Slowdown in the rate of environmental change that is caused by construction.
6. Expansion of water quality improvement, even broader than the 1972 amendments.

Linsley, speaking to a predominantly university audience, said that we still need some answers and he sees a great opportunity for the universities to help solve water-management problems as the planning moves from the federal government to state and local levels. He listed seven study areas wherein answers are needed:

1. Effective pricing of water and water services.
2. Water conservation in use.
3. Techniques for effective public participation.
4. Techniques to study alternate futures rather than projecting past trends.
5. State water laws.
6. Interrelations of water use and land use.
7. Flood-plain management.

The recommendations of the Commission Report are sweeping, and many of them propose drastic changes in our system of values. Some of them could be implemented by executive order of the President, whereas the rest require Congressional enactment through the normal legislative process including hearings.

#### **WATER RESOURCES COUNCIL ESTABLISHES PRINCIPLES AND STANDARDS FOR PLANNING WATER AND RELATED LAND RESOURCES**

The Water Resources Council recently published in the "Federal Register" dated September 10, 1973, Vol. 38, No. 174, principles and standards for planning water and related land resources.

The Principles were established for planning the use of the water and related land resources of the United States to achieve objectives, determined cooperatively, through the coordinated actions of the federal, state, and local governments; private enterprise and organizations; and individuals.

The Principles provide the basis for federal participation with river basin commissions, states, and others in the preparation, formulation, evaluation, review, revision, and transmittal to the Congress of plans for states, regions, and river basins; and for planning of federal and federally assisted water and land resources programs and projects and federal licensing activities as listed in the Standards.

Plans for use of the nation's water and land resources will be directed to improvement in the quality of life through contributions to the objectives of national economic development and environmental quality. The beneficial and adverse effects on each of these objectives will be displayed in separate accounts with other accounts for the beneficial and adverse effects on regional development and social well-being. Planning for the use of water and land resources in terms of these objectives will aid in identifying alternative courses of action and will provide the type of information needed to improve the public decision-making process.

The overall purpose of water and land resource planning is to promote the quality of life, by reflecting society's preferences for attainment of the objectives defined below:

1. To enhance national economic development by increasing the value of the nation's output of goods and services and improving national economic efficiency.
2. To enhance the quality of the environment by the management, conservation, preservation, creation, restoration, or improvement of the quality of certain natural and cultural resources and ecological systems.

The Water Resources Council, an independent executive agency of the federal government, is composed of the Secretaries of Interior; Agriculture; Army; Health, Education and Welfare; Transportation; and the Chairman of the Federal Power Commission. Participants also include the Secretaries of Commerce and of Housing and Urban Development; Administrator of the Environmental Protection Agency; Attorney General; Director of the Office of Management and Budget; Chairman of the Council on Environmental Quality; and the Chairman of each River Basin Commission.

#### **COLORADO PLATEAU ENVIRONMENTAL ADVISORY COUNCIL (CPEAC) HOLDS ANNUAL MEETING**

The CPEAC met Friday, October 5, 1973 at the Harold S. Colton Research Center, Museum of Northern Arizona, Flagstaff, to discuss "Energy Development and/or Beauty on the Colorado Plateau." Specific topics included *The Energy Resource*, by Dr. Eric Walther, Executive Director, CPEAC; *Coal-Fired Thermal-Electric Generation*, by Mr. Frank G. Scussel, Salt River Project; *The Gasification of Coal*, by Mr. Charles E. Hunter, El Paso Natural Gas Co.; *The Transmission of Electricity from Sources to Cities*, by Dr. Raymond Kary, Arizona Public Service Co.; *The Aesthetic Impact of Energy Development*, by Dr. Willard Gillette, Northern Arizona University; *The Probable Air Quality Impact*, by Mr. David Layton, University of Arizona; *The Socio-Economic Impact*, by Lynn Robbins, West Washington State College; *The Impact*

of *Energy Development on Water Resources*, by Dr. Gordon Jacoby, Lake Powell Research Project; and *Surface Environment and Mining*, by Dr. Otis L. Copeland, U.S. Forest Service, Ogden, Utah.

Dr. Gordon Jacoby, principal investigator and hydrologist from the University of California, Los Angeles, on the Lake Powell Research Project, discussed water availability in the Colorado River along with the water and land requirements of different energy sources. The Colorado River Compact provided 7.5 million acre-feet per year to the Lower Basin (Arizona, California and Nevada), 7.5 to the Upper Basin, and 1.5 to Mexico for a total of 16.5 million. New reservoirs evaporate 0.75 million acre-feet per year. Dr. Jacoby reviewed the water commitments of each Colorado River Basin state, showing that only Wyoming and Utah have any uncommitted water at present.

According to the figures reported, hydro-electric power from Glen Canyon Dam requires 700 acre-feet per megawatt (mw), while coal-fired thermal electric generation requires 15 acre-feet/mw, coal gasification requires 10 acre-feet/mw and current nuclear power requires 23 acre-feet/mw per year. The land use of Lake Powell provides 3.6 mw per square mile ( $\text{mi}^2$ ), while the Black Mesa strip mine provides 180  $\text{mw}/\text{mi}^2$ , coal for gasification provides 70  $\text{mw}/\text{mi}^2$ , and the land for Dr. Aden Meinel's solar farm concept would provide 100  $\text{mw}/\text{mi}^2$ .

A summary of the meeting is available from Dr. Eric Walther, Northern Arizona Museum, Flagstaff, and the papers presented by Mr. Scussel and Mr. Hunter are available in their entirety. Dr. Walther reported that should interest in any of the other papers demand transcribing from a taped recording of the meeting, this could be done.

#### UTAH DRAFTS WEATHER MODIFICATION RULES

Utah enacted a weather modification statute earlier this year and appropriated a modest sum to be used by the Utah Division of Water Resources to determine the best areas in the State to conduct weather modification operations and experiments. The Division will also develop rules, regulations and modes of procedure pertaining to their weather modification

act. Most of the funds appropriated will go to pay for a contract with the Utah Water Research Laboratory, a State funded facility, to formalize and recommend the rules and regulations for adoption by the Division.

Paul Gillette, a water resources engineer with the Utah Division of Water Resources, was designated chief of its Weather Modification Section and given the initial assignment of assisting the Water Research Laboratory in developing the rules and regulations.

The *Rules and Regulations Pertaining to Weather Modification* adopted by the State of Texas were recommended to Gillette by Ray Jay Davis, a professor of law at the University of Arizona, as a model for consideration when the Utah Division of Water Resources drafts its own rules and regulations. Professor Davis recommended that Gillette visit the Texas Water Development Board and personally go over the Board's rules and regulations with a view toward determining how they may be modified to fit the Utah situation. Gillette visited with John Carr, director of the Board's Weather Modification and Technology Division, on August 28 and 29 for this purpose.

During the visit, Gillette also received a briefing on the composition and responsibilities of the Board's Weather Modification Advisory Committee.

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

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