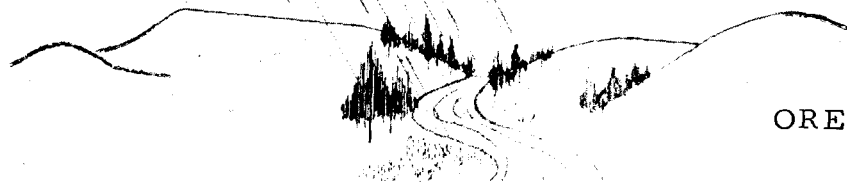
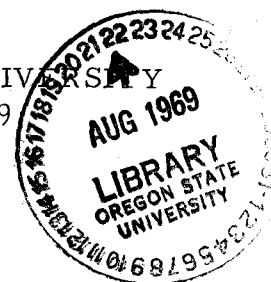


Water in Oregon



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CRISIS: WATER

In a booklet entitled "Crisis: Water," published in 1968 by the Central Lane Planning Council, Eugene, Oregon, the following recommendations are made for improving or expanding existing programs:

1. Some form of regional water pollution control authority should be established to serve the entire Willamette Basin.
2. All major cities in Oregon should be required to initiate further improvement in sewage treatment at the earliest possible date.
3. The separation of storm and sanitary sewers should be undertaken wherever sewage treatment plant effectiveness is seriously impaired during periods of heavy rainfall.
4. Flood plain lands should be used exclusively for agricultural or park purposes in view of the fact that such areas can contribute large amounts of silt to nearby rivers during periods of flood and heavy rainfall unless the soil is firmly anchored by vegetation. The establishment of green belts and parks in flood plain areas, as proposed by the Willamette Greenway plan, would reduce the siltation potential of such areas.
5. The effects of reservoirs on pollution levels should be studied extensively before more dams are constructed in the upper valley, with special attention to the fact that reservoirs can substantially reduce dissolved oxygen supplies. Curtailment of dam construction on premium recreational streams, such as the McKenzie and its tributaries, may well be indicated by such research.
6. Before any nuclear power generating stations are constructed in the upper valley, federal performance standards for the handling of coolant waters should be reviewed and, if necessary, upgraded in order to avoid thermal pollution.
7. The disposal of septic tank wastes anywhere other than at approved sewage treatment plants should be curtailed.
8. As new sites are chosen for sanitary land fill disposal sites, attention should be given to the sites' water pollution potential. Older open dumps (where refuse is burned) are often responsible for water pollution as well as air pollution. It is therefore doubly important that existing open dumps be modified, as soon as possible, into approved waste disposal systems.

9. An area-wide public information program should be established in order to inform the general public about existing and potential water pollution problems.

The report is one of a planned series dealing with problems in the Eugene-Springfield metropolitan area and the upper Willamette Valley. They are intended to provide objective background information and suggest possible solutions. They are expected to stimulate public dialogue and debate and to foster public feedback.

MODEL DEVELOPED FOR WATERSHED STUDIES



A computer program has been developed at the University of Nevada to make a hydrologic water budget type analysis for each of 19 watersheds comprising a river basin. The problem was to develop a digital computer model which would reasonably reproduce recorded runoff and account for all additional gains and losses of water from a watershed. Once the model was successful in reproducing historical records, it was used to investigate the effect of proposed changes in the physical makeup of the basin such as change in land use or the introduction of small hydraulic structures to a watershed.

The model developed for this study is designed to use daily precipitation and temperature values as input data for the water budget analysis. Each watershed analyzed is broken into elevation zones which are further divided into subareas having distinct soil moisture holding capacities and cover types. A daily analysis was run computing surface runoff, ground-water runoff, soil moisture changes, evapotranspiration, and accumulation or depletion of snow for each subarea within the watershed.

The model developed includes subroutines which allow it to handle irrigated and semi-irrigated lands and simple reservoir operation for irrigation storage. Each watershed having representative streamgages was analyzed for the period of record for which sufficient climatological data was available. Watersheds having no representative streamgages were analyzed for 10 years using similar gaged watersheds as a check on the results obtained.

The model was described as able to reproduce recorded runoff and account for additions and depletions in a watershed with reasonable accuracy, but it is primarily limited by the availability of representative climatological input data. It has proven to be useful in areas where a minimum of data is available. The reference is: Fordham, John W., Basin Simulations as Applied to Mountain Basins with Snowmelt Runoff. Master's thesis, Department of Civil Engineering, University of Nevada, Reno, Nevada, January, 1968 (unpublished).

A booklet is available from the U.S. Government Printing Office for 55 cents entitled "Improving the Quality of Urban Life". It tells about the Department of Housing and Urban Development (HUD) federal aid to communities in the field of open space, urban beautification, and water and sewer grant programs.

PROGRAMS OFFERED TO AID IN ANALYZING FLOOD CONTROL

Within the last few years, the growing realization that an effective flood control program must include non-structural measures (land use management and flood proofing) has resulted in Presidential Executive Order 11296 requiring Federal agencies to seek the optimum combination of structural and non-structural measures for flood control. The requirement has created a dilemma. No methodology is available for systematic evaluation of alternative combinations of structural and non-structural measures. Prospective procedures are too time consuming to be feasible under current financial and manpower limitations.

One way out is to perform much of the planning process by digital computer. With this goal, two flood control planning programs have been developed. Each program systematically selects the optimum combination of channel improvement, flood proofing, and land use management by location within the flood plain and by time.

The second program adds detention storage to the list of available alternatives. Both programs contain the entire planning process by going all the way from raw data to a selected optimum program of measured use in one run. However, the programs are not intended to produce a finished design. Their use should be followed by a final check to verify the input data and preparation of the plans and specifications necessary for implementation.

The programs have been applied to a series of flood hazard areas in California and Kentucky and indicated an optimum flood control program in a small fraction of the

FWPCA GRANTS

Construction grants have been awarded by the FWPCA to help build waste treatment facilities in the following cities:
Jefferson - \$54,200; Malin - \$26,850;
Portland - \$1,555,400; Tigard - \$37,400.

SOIL AND WATER

Agreements were signed recently by the Interior Department with the Jackson Soil and Water Conservation District and the Polk Soil and Water Conservation District. The purpose of the agreements is to solve internal problems related to the improvement, development and utilization of natural resources within the boundaries of the conservation districts.

time spent in current planning methods. They free the planning engineer from spending most of his time in routine calculations and allow more time for consideration of qualitative and intangible factors.

Principal Investigator in research leading to development of the models is Dr. L. D. James of the University of Kentucky, Lexington, Ky. The programs and the computer card decks are available by writing to him. The programs have all been extensively used and debugged, but those applying them to new and different situations may still encounter difficulty. Others may wish to change the programming in accordance with specific local conditions or agency policies. The help of Dr. James is also available for this purpose. He has summarized his findings in "Economic Analysis of Alternative Flood Control Measures," Research Report No. 16, 1968, Water Resource Institute, University of Kentucky.

NITROGEN CONTENT OF OREGON RAINFALL.....In some parts of the world, usually interior regions of the larger continents, rainfall contains enough nitrogen to be a significant source of plant nutrition. Most of this nitrogen is added to the atmosphere from land-derived materials or from industrial pollution.

WATER RECREATION

Research conducted at the University of Maryland reveals that the distance of the potential recreationist from recreation areas is the dominant factor affecting intensity of use. Educational level of potential recreationists is the most important socio-economic factor. Income levels, urbanization, individual mobility and race are factors of less importance.

In areas that are characterized by their uniqueness, whether water based or otherwise, the distance factor has a reduced influence. An example would be Crater Lake.

Coastal Oregon rainfall, on the other hand, contains very little nitrogen, because it is influenced dominantly by the ocean. Over a year's time, only 1.3 pounds of nitrogen is brought to the soil surface in rain falling on a coastal Oregon site. Of this small total, only about 0.2 pounds is considered to be a real addition of nitrogen from the atmosphere. The remaining 1.1 pounds is only a local redistribution of air borne organic material.

These facts were uncovered in research conducted by R. F. Tarrant and K. C. Lu of the Pacific Northwest Forest and Range Experiment Station, USDA, in collaboration with C. S. Chen and W. B. Bollen of OSU's Department of Microbiology.