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WATER RESOURCES NEWS

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PROPOSAL DEADLINES FOR RESEARCH PROJECTS

Matching grant proposals for consideration for funding in the 1972 program of the Nebraska Water Resources Research Institute must be submitted to the Institute Director by October 15, 1970. Basic Allotment Proposals are due on December 1, 1970 and Title II research projects must be submitted no later than October 1, 1970. Prospective researchers are advised to consult with the Director before preparing formal proposals. Call 3307 for further information.

MR. EUGENE EATON VISITS NEBRASKA INSTITUTE

Mr. Eugene Eaton, Associate Director of the Office of Water Resources Research, recently spent several days consulting with researchers of the Nebraska Water Resources Research Institute. On May 6, Mr. Eaton presented a Seminar on "The Research Mission of the Office of Water Resources Research with Special Emphasis on Current Areas of Priority." A tour of the Research Facilities at Mead, Nebraska was also conducted during his stay in Lincoln.

EUTROPHICATION PUBLICATION AVAILABLE

"Eutrophication: Causes, Consequences, Correctives," is now available, according to the National Academy of Sciences. The publication contains 668 pages and serves as a useful reference on eutrophication (accelerated dying of lakes) for scientists and water resources managers. The volume is also valuable for its definitive treatment of detection, measurement, prevention and correction of the "green sickness" which plagues many of the world's freshwater bodies. Available from: NAS, Printing Office, 2101 Constitution Ave., Washington, D.C. 20418

SYMPOSIUM ON MAN-MADE LAKES

An International Symposium on Man-Made Lakes will be held at Knoxville, Tennessee on May 3-7, 1971. The Symposium will focus mostly on the bodies of water created by man, their

(SYMPOSIUM ON MAN-MADE LAKES, continued)

management problems, and their effects on the surrounding environment. The sessions will promote communication among the many disciplines and skills concerned with man-made lakes.

NATIONAL SCIENCE FOUNDATION PROVIDES GRANT FOR STUDENTS

The National Science Foundation is providing a grant of $4,720 for five undergraduate students at Heidelberg College, Tiffin, Ohio to conduct a study of pollution of the Sandusky River this summer. It is hoped that the results will be useful in developing local pollution controls, but that they will also be applicable to more widespread problems. Other objectives are to arouse interest in environmental research, with emphasis on local pollution problems; and to gain experience in original environmental research.

DEPARTMENT OF THE INTERIOR TO SPONSOR CONFERENCE ON ENVIRONMENTAL POLLUTION

A four-day conference and exposition is being planned for early next fall on environmental pollution and will be sponsored by the Department of the Interior. Secretary Hickel said the conference was being called in response to President Nixon's call for "a total mobilization" for cleaning up our environment. It is expected that many leaders from industry, government, national organizations, and universities will join in the conference. The National Environmental Pollution Conference and Exposition will be held September 29 through October 2 in the Sheraton Park Hotel in Washington, D.C.

PRESIDENT SIGNS WATER QUALITY IMPROVEMENT ACT OF 1970

The latest amendment to the Federal Water Pollution Control Act has been signed by the President. The Water Quality Improvement Act of 1970 includes new federal authority for thermal pollution, oil spills, vessel sewage, manpower training, Great Lakes pollution, field laboratories, land acquisition and a new Office of Environmental Quality in the Executive Office of the President.

POSSIBLE RECLAIMATION OF WASTEWATER FOR DENVER?

University of Colorado Engineers are working on a pilot plant to determine the feasibility of reclaiming metropolitan wastewater for industrial use by the City of Denver. If the

(POSSIBLE RECLAIMATION OF WASTEWATER FOR DENVER, continued)

studies prove successful, Denver's growing population could have what amounts to a major addition to its industrial water supply by the mid-1970's, and possible suitable additions for drinking purposes by mid-1980.

WATER QUALITY ADMINISTRATION SEEKS STUDIES ON COST OF PREVENTING POLLUTION

Organizations interested in conducting investigations and studies of methods of financing the cost of preventing, controlling, and abating water pollution should contact the Federal Water Quality Administration.

Studies may be conducted in any or all of the following subject areas: point pollution from sources such as municipal, industrial, storm and combined sewers, and agricultural operations; nonpoint pollution from urban and rural land drainage, agricultural sources, return flows, animal raising, and feeding operations; modified point source pollution from spills or discharges of oil or hazardous materials in production, transport, transfer, or storage; and modified nonpoint source pollution from mine drainage of acids, soil sediments, and dissolved solids.

Each of the investigations and studies to be carried on in the above pollution source areas should include an assessment of various levels of responsibility, including organizations, individuals, and state, local, and federal governments. This assessment should in turn be related to financing needs and alternative methods of meeting these needs.

Not more than seven typewritten pages may be submitted explaining the qualifications of an organization and only those sources that are determined qualified will be invited to submit proposals. An original and two copies of qualifications should be sent to the Federal Water Quality Administration, Department of Interior, 1921 Jefferson Davis Highway, Crystal Mall, Building 2, Room 700, Attn: G. Phillips, Arlington, Va. 22202.

NEW POLLUTION CONTROL PROPOSED BY SECRETARY HICKEL

Secretary of the Interior, Walter J. Hickel announced the proposal of new water pollution control rules which will apply to construction grants to communities. Rules are summarized as follows:

> Comprehensive river basin-wide programs for pollution abatement must be developed, and new treatment works would have to fit in with such programs, as well as with metropolitan and regional plans, to be eligible for Federal aid.

(NEW POLLUTION CONTROL PROPOSED, continued)

In evaluating new applications, Interior may demand detailed data on the entire river basin's sources of pollution, volume of discharge from each source, character of effluent, present treatment, water quality effect and other items.

No new Federal grant would be made to any system designed to treat industrial wastes only. If some industrial wastes are to be treated as part of the system's operations, industry would have to pretreat those wastes to ensure they would not interfere with efficient operation of the community system.

A system of "cost recovery" would be required if some industrial wastes are to be treated in a new plant built with federal aid. Such cost recovery by the municipality would assess the industries a share of the operating costs, and costs of amortizing the debt, in proportion to their contributions to the total cost of waste treatment.

State water pollution control agencies must inspect new federally-aided facilities for efficiency and economy at least once each year for the first three years of operation, and periodically thereafter, under standards set by FWQA.

Design of any new federal-aid treatment plant would have to be approved in advance as economical, efficient, and effective under FWQA requirements.

HIGH-PRIORITY PROBLEM AREAS

The Committee on Water Resources Research has identified the following five specific problems which warrant immediate increased research support in the long-range program for Federal water resources research currently under revision.

Managing metropolitan area water systems: The growth of metropolitan areas is intensifying every problem associated with the urban water use, including: Provision of municipal and industrial water supply, collection and treatment of sewage and industrial wastes, drainage of storm waters, prevention of floods, and provision of waters for recreational use. The problem encompasses: An inadequate hydrologic data base, relatively crude models for design of regional systems, uncertain public and private water resource investment policy, political and institutional obstacles to effective planning and management, shifts of population groups within the metropolitan area, and integration of water system with other elements of urban planning. The challenge to the research effort is evident in

(HIGH-PRIORITY PROBLEM AREAS, continued)

the magnitude of the urban water system investment, estimated at $112 billion in 1966 with annual capital expenditures estimated at more than $10 billion. The urgency of the need is reflected in the fact that the Federal research expenditure for metropolitan area water system planning in fiscal year 1969 is estimated at less than $1 million.

Improving regional water resource planning and management: The Committee on Water Resources Research has repeatedly called attention to the need for research on planning and managing water resources systems. In 1968, COWRR stated: "A sharp reappraisal of management strategies and the innovation of new procedures are needed in order to improve water resources planning and meet water development needs." The importance of the need for knowledge continues to grow. Two areas in particular have emerged as significant research needs: A procedure for analyzing and evaluating competing social objectives and a procedure for deriving maximum beneficial use of the powerful technique of systems analysis in the management process. Analysis of alternative social objectives involves study and resolution of conflicting social values and aspirations. The research need extends to evaluation of the influence of group attitudes and behavioral patterns on social decisionmaking processes. It extends further to an understanding of the origin of institutions and the nature of institutional change. Application of systems analysis requires the development of conceptual models to represent highly complex water resource systems, and an evaluation of alternative approaches to attaining the desired goals.

Controlling pollution caused by heated water discharges, oil, and sediment: The national program of water quality improvement faces many difficulties including the still, unsolved problems of eutrophication, agricultural land drainage control, combined sewer overflows, storm sewer pollution, and industrial wastes. In addition, three problems of great significance have emerged in recent years: thermal pollution, oil pollution, and sediment pollution.

Given current projections of population and industrial growth, it is generally assumed that within a decade the electric power industry will require a significant portion of the available fresh water runoff of the Nation for condenser cooling purposes. If no restrictions were places on release of waste thermal energy to the water resource, the results would be catastrophic, indeed. National policy would, of course, not permit this to happen. However, the Nation's development requires that essential power demands be satisfied. It is clear that the Nation's welfare requires a substantial effort to find economic ways for cooling and recycling such heated discharges.

(HIGH-PRIORITY PROBLEM AREAS, continued)

Probably no waste has impressed itself on the Nation's awareness as have the discharges of oil from vessels and offshore oil wells. The problem of oil pollution certainly will become greater as tankers of greater size are brought into use, as oil resources of the near coastal zones are increasingly exploited, and as oil handling facilities are constructed at locations close to valuable waters. The particular Santa Barbara incident and other similar spills have exposed the weakness of available protective procedures and the inadequacy of current knowledge on how to improve control techniques. The gross pollutional effects of oil discharges emphasize the urgency of the need to improve our ability to cope with such disasters. Such knowledge is needed promptly. Research on prevention, control, and removal of oil pollution, and on reducing damages resulting from such pollution merits maximum support at this time.

Because of sharpened awareness of pollutional conditions threatening the Great Lakes, recent attention has focused on pollution by sediments. Formerly such material was thought to consist largely of inorganic silts resulting from river bank and upland farm erosion and from road and land development activity. The offshore disposal of dredgings composed of such inorganics created little concern. It is now known that sediments near the mouths of tributaries contain high concentrations of organics and nutrient chemicals originating in municipal and industrial waste effluents, as well as other constituents of possibly toxic character. The uncertain but possibly significant ecologic damage in the Great Lakes that may result from disposal of dredgings has excited considerable concern among ecologists, conservationists, and others. For this reason, research on dredged sediments is needed to help define the relative significane of this pollution.

Protecting the public health: The Nation's past success in essentially eliminating acute waterborne communicable diseases has been truly remarkable. Unfortunately, this success has led to a "taking-for-granted" attitude with respect to continued need for vigilance in assuring safe drinking water supplies. The fact is that most public water supply systems were developed in an earlier generation. They have difficulty in coping with problems brought on by rapidly expanding urbanization, increased water use, and growing degradation of sources of supply. Advancing technology and industrialization have introduced increasing numbers and quantities of chemicals into water sources. Increased water reuse accentuates these problems. Water-borne outbreaks of diseases such as salmonellosis and hepatitis continue to occur. Beyond these common, familiar hazards, are the uncertain but possibly highly significant chronic, subtle, long-range effects that may be associated with trace metals and organics of industrial origin.

(HIGH-PRIORITY PROBLEM AREAS, continued)

Predicting ecologic change: Predicting the response of water-related eco-systems to man-induced environmental change is fundamental to planning for resource use -- but our ability to make such predictions is crude indeed. While there may be little difficulty in predicting the character of impacts produced by extreme environmental change; for example, a sharp, high temperature rise, it is the potential highly significant effect of the subtle change in environment that has emerged as a significant planning problem. The question that frustrate planners relate to the undesirable effects that might be produced by such engineering projects as the construction of a conduit for discharging concentrated chemicals in coastal waters; the construction of interconnections between hitherto separated bodies of water; the regulation of flow of hitherto free-flowing streams, the construction of an express highway through a wetland; the regulation of water movement in an estuary. In the case of man's welfare, the significance of ecologic changes in the recurring cycles of certain zoonotic diseases has been amply and repeatedly demonstrated. For example, coccidioidomycosis is endemic in the arid Southwest. Extensive irrigation of this area is likely to produce environmental conditions that are unfavorable to the existence of the fungus producing this disease. On the other hand, however, the modified environment may well prove favorable to an extension of the range of the mosquito vector of encephalitis and therefore this zoonotic disease may become established in the reclaimed area. The subtlety and variety of ecologic responses to manmade environtal change are great, indeed. They emphasize the need for a generalized, comprehensive theory which could serve as a framework for detailed qualitative and quantitative predictions as to how ecosystems may be expected to react to specified alterations in the environment. This need, already significant, will become increasingly important as the Nation's growth is reflected in an expanded national program of water resources development. Without the knowledge that would be provided by these procedures, the planning process is incomplete, and the basis for decision on project design is defective or inadequate.

Testimony to the importance of ecologic considerations in progress reports of engineering development of estuaries is contained in a study being conducted by the Corps of Engineers. The study, "Effects of Engineering Action on Coastal Ecology," seeks to provide guidelines for protection of ecologic values and improvement of management of estuaries and coastal waters. It is foreseen that future construction activity in such waters will be based on the findings of the study.

RESEARCH REVIEW

Project Title:	"Nebraska Droughts: A Study of Their Past Chronological and Spatial Extent with Implications for the Future"
Principal Investigator:	Dr. Merlin P. Lawson
Dates:	July 1, 1970 to June 30, 1971

In Nebraska and much of the Midwest, the regional economy is in critical adjustment to variations in precipitation. As a result, there is a decided need for more reliable information on forecasting the intensity and frequency of droughts. Studies of the significance of the relationship between precipitation deficiencies and rural population are also lacking. Such studies can be of particular value in identifying regions of potential population stress during drought. An important question is: Are these relationships changing during time? The information to be derived from the proposed research would significantly enhance the capabilities of state water resources planners to identify areas which are in most critical rural population adjustment to precipitation fluctuations. The research techniques and methods of analysis developed through this project should be highly transferable to other areas of the Midwest. The project is of state and regional significance.

NEW PUBLICATIONS RECEIVED BY THE INSTITUTE

1. "A Limnological Study of the Lower Farmington River With Special Reference to the Ability of the River to Support American Shad," by W.R. Whitworth and D.H. Bennett, University of Connecticut, February 1970.
2. "Industrial Use and Community Supplies of Water in Alabama," by D.R. Street, R.R. Criss, R.L. Burks and J.H. Baker, Auburn University, January 1970.
3. "Research on the Morphology of Precipitation and Runoff in Texas," by R.A. Clark, Texas A & M University, February 1969.
4. "A Method for Predicting Pollutant Transport in Tidal Waters," by H.B. Fisher, University of California, March 1970.

NEWSLETTER ITEMS

Newsletter items and inquiries should be sent to: Dr. Warren Viessman, Jr., Director, N.W.R.R.I., 212 Agricultural Engineering Building, East Campus, Lincoln, Nebraska 68503