NEWS
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CONTENTS

GOVERNOR SCOTT TO OPEN POLLUTION SYMPOSIUM

Governor Bob Scott of North Carolina will open the National Symposium on Costs of Water Pollution Control at Raleigh on April 6 and 7, 1972. He will be presented to the Symposium by N. C. State Chancellor John T. Caldwell.

The program is rapidly firming up and will be announced in the early future. It will include an impressive list of national figures from industry, government, consulting engineers, conservation organizations, and the university community who will speak on the economic implications of national goals, cost effectiveness and economic incentives for pollution control, and the economics of industrial waste management.

HOUSE HEARINGS ON WATER POLLUTION CONTROL

Hearings by the House Committee on Public Works on amendments to the Federal Water Pollution Control Act opened on December 7. The Senate has already adopted similar legislation.

Russell E. Train, chairman of the President's Council on Environmental Quality, said the Administration supports: the objective of achieving water quality fit for swimming and similar uses in all areas where feasible and appropriate by 1981; the requirement for use of the best practicable technology for control of industrial pollution by 1976; the need for precise effluent limitations tailored to achieve water quality objectives; and the strict limitation or prohibitation of the discharge of toxic substances.

The principal disagreement between the Administration and proponents of the Senate-passed measure is the question of goals and how to achieve them. The Senate bill, for example, would drop the water quality standards concept and ask for zero discharge by 1985. It would also ask for swimming water quality in all streams by 1981.

In Train's statement, he said, "The heart of the Administration's proposal is to relate treatment requirements to the achievement of ambient water quality goals." This goal would be met by 1976.

Governor Rockefeller of New York told the Committee that the Senate goal of no pollution by 1985 would disillusion the public when it became apparent that this was technically and economically impossible of attainment.

Paul McCracken, Chairman of the Council of Economic Advisers, presented figures on the shrinking amount of unclaimed future production and the alleged inflationary aspects of overspending on waste treatment facilities. He reported that the rate of growth of treatment construction has been about 25% annually over the past two years with the rate of inflation at about 12%.

COASTAL ZONE MANAGEMENT

The Senate Commerce Committee approved the coastal and estuarine zone management bill on December 1, but indecision as to committee and agency jurisdiction will hold up further action until next year. Three Congressional Committees (Interior, Banking and Currency, and Public Works) have indicated possible conflicts with their responsibilities.

REFERENDUM ON CLEAN WATER BONDS

As a result of General Assembly action at the October special session, the date for the State referendum on the $150 million Clean Water Bond issue has been changed to May 6, 1972.

WATER RESOURCE PROBLEMS AND RESEARCH NEEDS IN NORTH CAROLINA

A revised draft of a report on Water Resource Problems and Research Needs in North Carolina has been prepared by Institute Director Howells and distributed to university faculty throughout North Carolina as a source of guidance for research proposals under the Institute's program. The report has been greatly strengthened through review and comment from Advisory and Technical Committee Members, interested faculty, and professional staff from public agencies. A limited number of additional copies are available upon request. Publication as an Institute report is anticipated early next year.

DEADLINE NEARS FOR WATER RESEARCH APPLICATIONS

University faculty are reminded of the February 1 deadline for receipt of new proposals under the Institute's FY 1972-73 annual allotment program.

NEW INSTITUTE REPORTS

Report No. 3 (Revised): Water Resources Research Interests in the Colleges and Universities of North Carolina
July 1, 1971

A current listing of all faculty members at 13 colleges and universities in North Carolina who have expressed an interest in water resources research. Compilation includes name, department, school, and water related research interest.

Report No. 4 (Revised): Inventory of Active Water Resources Research Projects in North Carolina

An inventory of all active water resources research projects underway in North Carolina. Includes 9 colleges and universities, Research Triangle Institute, 8 private industries and electric utilities, and 13 state and federal agencies.

Report No. 53: Small Watershed and Drainage Laws of North Carolina
by
Prof. Milton S. Heath, Jr.
Associate Director
Institute of Government
University of North Carolina at Chapel Hill

A review of the statutory basis of small watershed and drainage programs with findings and recommendations concerning revision of present laws and recodification.

ENVIRONMENTAL IMPACT STATEMENTS

CEQ's 102 MONITOR for November carried an informative list of 20 questions and answers explaining the environmental impact process. A copy is available at the Institute for review.

The following new environmental impact statements were listed for North Carolina:

Department of the Army

Sugar and Briar Creeks project, Catawba River Basin (flood control) includes 7.5 miles channelization (Draft).

Jetties at Beaufort Inlet, Morehead City Harbor (navigation) involves construction of east-west jetty. (Draft).

New Hope Lake Project, Haw River Basin. See p.4, November issue of News (Final).

Department of Transportation

SR-2564, Raleigh, Wake County (Draft).

US-17, Pasquotank and Camden Counties (Draft).

Charlotte Inner Loop, Mecklenburg County (Draft).

Corporation Freeway, Forsyth County (Draft).

US-17, Chowan County (Final).

U. S. Water Resources Council

Kanawha River Comprehensive Report. Early action programs include 21 multipurpose reservoirs, 17 upstream watershed projects, etc. (Draft).

ENVIRONMENTAL BIBLIOGRAPHY

The Department of Environmental Sciences and Engineering, UNC, Chapel Hill, has prepared a selective bibliography of environmental books and pamphlets which students and faculty will find useful. Contact Librarian Marion G. Krugman, Box 630, Chapel Hill, N.C. 27514.

LEGAL STUDIES

The National Water Commission has announced the availability of reports on three legal studies. The first, by Prof. F. J. Trelease, University of Wyoming, is entitled "Federal-State Relations in the Law of Water Rights," and deals with a number of controversial issues in water law. These include federal reserved rights for Indian Reservations, National Forests and other federal establishments; the immunity of the United States government from law suits; the compensability of water rights taken for navigation projects; and the coordination of state and federal practices and procedures in water resource development. The report may be ordered from National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22151. The Accession Number is PB 203 600 and the price is six dollars.

The second is "The Interstate Compact and the Federal Interstate Compact." It was prepared by Jerome C. Muys, an attorney in private practice and formerly Chief of the Legal Section and Assistant General Counsel of The Public Land Law Review Commission. The report discusses and evaluates the uses of the compact device in the water resources field, particularly in the areas of water allocation, pollution control, planning, flood control, and multipurpose regulation.

A third report entitled "The Federal-State Regional Government Corporation," was written by Richard A. Solomon, an attorney and formerly General Counsel of the Federal Power Commission. This explores the possibilities of using a new Federal-State corporate mechanism to solve multi-state water problems, especially problems of water supply and sewage disposal.

The latter two reports may be ordered from NTIS under accession numbers PB 202-998 (compacts) and PB 202-997 (regional corporation), and cost $6.00 and $3.00 respectively.

GROUND WATER POLLUTION

Scientists of the U. S. Geological Survey warned a Symposium on Underground Waste Management which opened in Houston, Texas, on Dec. 6, that problems arising from the underground injection of liquid wastes would multiply in the years ahead unless there is better knowledge of the underground environment. Research hydrologist J. G. Ferris told the group that the increasing tempo of "ecological crusades for cleanup of lakes and streams is driving pollution underground."

SUMMARIES OF SELECTED RESEARCH FINDINGS FROM OUTSIDE THE STATE OF NORTH CAROLINA

Wastewater Reuse - Jerome Davis. July 1971
Prepared for National Water Commission.
Report PB 201 535
Nat'l. Tech. Infor. Serv., Springfield, Va. 22151 ($3.00).

Regardless of its acceptance or non-acceptance for potable water supply, reused wastewater has enormous potential for increasing the water resources of individual localities and of the Nation. When it is realized that reuse of 80 percent of the wastewater discharged by a community would result in an effective increase in usable water resources by 400 percent, the magnitude of the potential becomes strikingly clear. Present technology is able to produce water of chemical quality equivalent to that of drinking water at a lower cost than from desalination of sea water. Its cost is still higher than the cost of natural water in most localities, but the cost differential will narrow and could reverse itself in coming years.

Further research leading to the establishment of attainable standards of chemical and virological safety will promote acceptance of reclaimed wastewater for potable supply in the future. Creation of recreational lakes and recharge of groundwater supplies are other uses for properly treated wastewater, but the largest available consumer for reclaimed wastewater is industry. Replacement of natural water by reclaimed water in industry will release large amounts of water for other uses. Thus, wastewater reuse can increase water resources greatly without concern for safety.

At the same time, application of advanced treatment processes to wastewater intended for discharge to receiving streams can, by reducing pollution, protect existing water supplies, and make current resources available for other use by not using the capacities of streams for self-purification.

However capable today's advanced treatment processes are, they are sure to improve in the future as the results of continued research and development are applied. This will lead to reduction in cost and to decreased complexity in advanced treatment plants. Advanced treatment will become more attractive as a means of augmenting water resources as a result.

Advanced waste treatment holds every promise of becoming a major factor in the Nation's water resources in the future.

<u>Effect of Water Resources on Economic Growth in the Tennessee Valley Region</u> - Charles B. Garrison, Dept. of Economics, The University of Tennessee

The study indicates a significant microlocation relationship between water-oriented manufacturing employment and water availability, where water availability is measured in terms of 7-day, 10-year minimum flow, in the 194-county Tennessee Valley Region. At the county level, chi-square tests of independence indicate that concentrations of at least 500 employees in water-oriented manufacturing (and increases of at least 250 over the period 1959-1968) are significantly related to water availability. Further, the tests indicate that a streamflow of at least 400 cfs is the critical or threshold level of water availability necessary for the occurrence of employment concentrations.

To explain the spatial distribution of employment concentrations within the region, additional location factors relevant to water-oriented industries were identified, and it was determined that the occurrence of these advantages tends to coincide with high population concentrations. Twenty geographically small regions within the study region were defined and a regression equation, with population density as the independent variable, was estimated to explain the variation among regions in employment per river mile. The regression indicates that, for an increase of 10 percent in population density (as between small regions), employment per river mile increases by 8.15 percent.

An estimate of the change in water-intensive employment over time by region also was derived. The change over the period 1959-1968 varied positively, but less than proportionately, with 1959 employment. As examples, the regression equation developed for this relationship indicates an increase of 200 employees for a (rural) region with 1959 employment of 500, and an increase of 2,200 employees for a (metropolitan) region with 1959 employment of 10,000, where both have equal endowments in water availability.

<u>Benefits of Water Quality Enhancement</u> - Dept. Civil Engr., Syracuse University, for Environmental Protection Agency, EPA Project 16110 DAJ 12/70 USGPO, Wash., D.C. 20402

Contains a discussion of the past practices and recent trends in water pollution control as it relates to water quality. Special consideration is given to the difficulties with both single item and multiple item water quality criteria. A new <u>Pollution Index</u> is proposed to measure the relative pollution when multiple items of water quality are considered. The Pollution Index is specific for one of three classifications of water use; human contact, indirect contact, and remote contact. An <u>Overall Pollution Index</u> is also proposed as a weighted average of the three Pollution Indices; the weight of each being related to the relative type use of the water course.

The dollar benefit of a lake or stream at a given water quality is determined by listing all uses which both affect and are affected by water quality, by valuing each use individually, and by summing the resultant values. The values of beneficial uses are measured by the willingness to pay of the user or an evaluation of benefits derived from avoiding payment. The value of these uses is estimated by taking surveys of the users at the lake or stream. The annual demand and unit benefit are determined for each use and the project gives total annual benefits for that use. Total annual dollar benefit at a given water quality is the sum of these benefits for each use. Annual social benefit is measured at existing water quality and estimated at an improved water quality. This estimate is made by comparison of user demand at lakes and streams with existing high water quality or by projection of latent user demand. The difference in the benefits at two different water qualities gives net annual social benefit which is the estimated annual increase or decrease in water quality. Onondaga Lake at Syracuse, New York is used as an example. An economic analysis using this procedure produces a net social benefit of 4.4 million dollars annually if Onondaga Lake water quality were improved to support swimming, sport fishing, municipal water supply and higher-valued shoreline land uses.

A study was undertaken of a methodology for water pollution abatement administration at the local or regional level, using Onondaga Lake, N. Y. Previous investigations regarding the sale of water pollution assimilative capacity, dollar benefits from pollution abatement, and pollution index were related in such a manner so as to establish a discharge price for polluting materials based on an increasing price with diminishing resources. The amounts to be sold are established by the governing board. Each discharger is given the opportunity to purchase some discharge privileges, but must at some time make the decision to remove contaminants rather than discharge them. Prices are established to make the purchase of discharge privileges prohibitive at the point where water quality becomes questionable for a stated objective.

PARASITIC DISEASE AND WATER RESOURCE DEVELOPMENT

Professor F. E. McJunkin, Dept. Env. Science and Engr., UNC-CH and Assoc. Institute Director, will speak on "Parasitic Disease and Water Resource Development in the Tropics" at 4 p.m., Feb. 21, 1972, Room 2010 Biltmore Auditorium, NCSU. Particular emphasis will be given to schistosomiasis. The seminar will be open to the public.

McJunkin recently returned from a visit to African and South American countries on behalf of A.I.D. where he served as a consultant on the control of water-related parasitic diseases.

INTERNATIONAL SYMPOSIUM ON HYDROLOGIC AND WATER RESOURCE SYSTEMS

An International Symposium on Uncertainties in Hydrologic and Water Resource Systems has been scheduled for the week of December 11, 1972, at the University of Arizona.

Further information can be obtained from Prof. C. C. Kisiel, Dept. Hydrology and Water Resources, University of Arizona, Tucson 85721.

ECONOMIC DISLOCATION FROM POLLUTION CONTROL

EPA's Ruckelshaus and Labor Secretary Hodgson have announced an early warning system to minimize economic hardships from pollution control enforcement actions. This will also include the resources of Department of Commerce, Small Business Administration, and Economic Development Administration.

EPA REGULATIONS

The Environmental Protection Agency has republished its regulations on environmental protection in the Nov. 25 Federal Register. Over 200 pages, the regulations are available through purchase from GPO, Wash., D.C. 20402 at 20¢/copy for Numbers 228 and 229, Vol. 36, Nov. 25 and 27, respectively.

WASTE TREATMENT PLANT GUIDELINES

The Environmental Protection Agency has now issued supplements to the Federal Guidelines for Design, Operation, and Maintenance of Wastewater Treatment Facilities for the guidance of consulting engineers. These are:

1. Plant Operation Manual and Guidance for Proper Operation and Maintenance
2. Responsibility for Design, Operation, and Maintenance
3. Sample Plan for Operation and Maintenance

These expand on EPA instructions for the operation of municipal waste treatment plants being constructed with federal grants under the Federal Water Pollution Control Act.

STATUS OF STREAMS AND GROUND WATER IN NORTH CAROLINA

Streamflow was excessive in the western Piedmont and mountains and near normal in the eastern Piedmont and Coastal Plain during November.

Ground water levels rose in most areas and were above long term average levels.

-U. S. Geological Survey

WATER RESOURCES LEGISLATION IN THE CONGRESS

New Public Laws:

H.R. 10203 To increase to $250,000 annual authorizations for water resources research centers in each State. Signed Dec. 2, 1971 (PL 92-175).

Bills Passed:

Senate

S. 1113 To establish a national environmental laboratory system, amended.

S. 1893 To restore the Golden Eagle program to the Land and Water Conservation Fund Act so as to provide for three categories of annual recreation permits, amended.

House

H.R. 9727 To ban the unregulated dumping of materials into the oceans, estuaries, and Great Lakes, with amendments.

Bills Introduced:

Senate

S. 2901 To amend the Wild and Scenic Rivers Act by designating a segment of the Colorado River in the State of Utah as a component of the national wild and scenic rivers system.

S. 2960
H.R. 12093 To amend the Watershed Protection and Flood Prevention Act so as to provide necessary assistance in connection with rural development.

S. 2971
H.R. 12129
H.R. 12130 To authorize the President to designate marine sanctuaries in areas of the oceans, coastal, and other waters, as far seaward as the outer edge of the Continental Shelf, for the purpose of preserving or restoring the ecological, esthetic, recreation, resource and scientific values of and related to such areas.

House

H.R. 11895
H.R. 11896
H.R. 12061 To amend the Federal Water Pollution Control Act.

NEW PUBLICATIONS RECEIVED BY THE INSTITUTE

(These may be borrowed from the Institute for a two-week period. Where individual copies are desired, readers are encouraged to request copies from the organizations issuing the publication. The addresses are provided by the News for this purpose.)

Water Resources Planning

"Design and Operation of an Information Center on Analytical Methodology," by Battelle Memorial Inst., EPA, USGPO, Wash., D.C. 20402, Price-$1.25, June, 1971.

"Operations Plan for Comprehensive Development: The Arkansas-Verdigris Waterway in the Ozarks Regional Commission Area," (IWR Rept. 69-2), by IWR, Dept. of the Army, Corps of Engr., Alexandria, Va. 22314, Dec., 1969.

"Evaluation of the Effects of Channelization on Fish Populations in North Carolina Coastal Plain Streams," by W. H. Tarplee, et al, N.C. Wildlife Res. Comm., Raleigh, N. C., 1971.

"Development Benefits of Water Resources Investments," (IWR Rept. 69-1), by IWR, Dept. of the Army, Corps of Engr., Alexandria, Va. 22314, Nov., 1969.

"An Application of Discriminant Analysis to the Division of Traffic Between Transport Modes," (IWR Rept. 71-2), by IWR, Dept. of the Army, Corps of Engr., Alexandria, Va. 22314, May, 1971.

"Environmental Guidelines for the Civil Works Program of the Corps of Engineers," (IWR Rept. 70-5), by IWR, Dept. of the Army, Corps of Engr., Alexandria, Va. 22314, Nov. 30, 1970.

"Estuarine Modeling: An Assessment," by Tracor, Inc., EPA, USGPO, Wash., D.C. 20402, Price-$4.50, Feb., 1971.

"The Lake Erie Congress: The Proceedings of the First Session, July 12-14, 1971," by the Inst. on Man and Sci., Rensselaerville, N. Y. 12147, Sept. 30, 1971.

"Agricultural Flood Control Benefits and Land Values," (IWR Rept. 71-3) by IWR, Dept. of the Army, Corps of Engr., Alexandria, Va. 22314, June, 1971.

"A Methodology for Flood Plain Development and Management," (IWR Rept. 69-3), by IWR, Dept. of the Army, Corps of Engr., Alexandria, Va. 22314, Dec., 1969.

"The Relationship between Land Values and Flood Risk in the Wabash River Basin," (IWR Rept. 69-4), by IWR, Dept. of the Army, Corps of Engr., Alexandria, Va. 22314, Dec., 1969.

"Ground Water Management in Development of a National Policy on Water," by L. E. Mack, Nat'l Tech. Inf. Serv., Springfield, Va. 22151, Jan. 31, 1971.

"The New Hanover County Pilot Project: A Resource Use Plan," by Coastal Zone Res. Corp., N.C. Dept. of C & D, Div. of Comm. and Sport Fish., Raleigh, N. C. 27602, Sept., 1971.

"Water as a Potential Organizing Concept in Urban Regions," by J. R. Sheaffer, et al, Cent. for Urban Stud., Univ. of Chicago, Chic., Ill. 60607, Sept., 1971.

"Water Resources Legislation of the 1971 General Assembly of North Carolina," by W. J. Wicker, Inst. of Govt., U.N.C. at Chapel Hill, Chapel Hill, N. C. 27514, Aug. 10, 1971.

Water Quality Management

"Demonstration of Rotary Screening for Combined Sewer Overflows," by City of Portland, Oregon, Dept. of Pub. Works, EPA, USGPO, Wash., D.C. 20402, Price-65¢, July, 1971.

"DDT in Water: A Bibliography," by USDI, WRSIC, Wash., D.C. 20240, Oct., 1971.

"A Methodology for Determining Optimal Longitudinal Spacing of Effluent Discharges into a River," by R. W. Deacon, et al, (Pub. No. 22), WRRC, Univ. of Mass., Amherst, Mass., 1971.

"The Effectiveness of a Contact Filter for the Removal of Iron from Ground Water," by S. W. Kim, IWR, Univ. of Alaska, Fairbanks (College), Alaska 99701, Jan., 1971.

"Stream Faunal Recovery After Manganese Strip Mine Reclamation," by VPI & State Univ., EPA, USGPO, Wash., D.C. 20402, Price-50¢, June, 1971.

"Oceanography of the Nearshore Coastal Waters of the Pacific Northwest Relating to Possible Pollution," (Vols. I & II) by Oregon State Univ., EPA,WQO, USGPO, Wash., D.C. 20402, Price: Vol. I - $5.25, Vol. II - $6.00, July, 1971.

"Onondaga Lake Study," by Onondaga County, EPA, USGPO, Wash., D.C. 20402, Price - $4.50, April, 1971.

"Control of Pollution from Outboard Engine Exhaust: A Reconnaissance Study," by Bio-Env. Engr. Div., Rensselaer Polytech. Inst., EPA, USGPO, Wash., D.C. 20402, Price - 50¢, Sept., 1971.

"Catalog of Pesticide NMR Spectra," by EPA, USGPO, Wash., D.C. 20402, Price-$1.50, April, 1971.

"Movement and Adsorption of Pesticides in Sterilized Soil Columns, Pub. No. 16," by R. S. Mansell, et al, WRRC, Univ. of Fla., Gainesville, Fla. 32601, Aug. 9, 1971.

"Phosphorus Removal and Disposal from Municipal Wastewater," by Univ. of Tex. Med. Branch, EPA, USGPO, Wash., D.C. 20402, Price-$1.25, Feb., 1971.

"The Radiochromatographic Analysis of Fresh Water Resources, Pub. No. 15," by S. P. Cram, WRRC, Univ. of Fla., Gainesville, Fla. 82601, Oct. 28, 1971.

"Response of Some Estuarine Fishes to Increasing Thermal Gradients," by J. J. Gift, et al, Ichthyological Associates, Bio. Lab., Middletown, De. 19709, June, 1971.

"Multi-Time Period, Facilities Location Problems: A Heuristic Algorithm with Applications to Waste Water Treatment Systems," by H. S. Bhalla, et al (Pub. No. 21), WRRC, Univ. of Mass., Amherst, Mass., 1971.

"Institutional Design for Water Quality Management: A Case Study of the Wisconsin River Basin," (OWRR C-1228), Vols. I-IX, by Univ. of Wisconsin WRC, Copies of following volumes available from U.S. Dept. Comm., NTIS, 5285 Port Royal Rd., Springfield, Virginia 22151, Price - $3-6.00:

Vol.		
I	-	Summary
II	-	Hydrology
III	-	The Development of Predictive Water Quality Model (Appendixes separate)

Vol.		
IV	-	Cost Functions for Influencing Water Quality
	-	Relation of Participation in Outdoor Recreation and Public Attitudes Toward Water Quality
V	-	Systems Analysis of Hydropower Production on the Wisconsin River
VI	-	The Nature of Minimum Cost Systems for Water Quality Management on the Wisconsin River
VII	-	Five Legal Studies on Water Quality Management in Wisconsin
VIII	-	The Economic and Fiscal Aspects of a Regional Water Quality Management System
IX	-	An Analysis of Alternative Institutional Patterns for Managing Water Quality on a Regional System Basis

Water Quantity Management

"Groundwater Availability in Piatt County," by E. W. Sanderson, (Cir. 107), Ill. State Water Survey, Dept. of Reg. and Educ., Urgana, Ill. 61801, 1971.

"Hydraulics of Long Vertical Conduits and Associated Cavitation," by St. Anthony Falls Hydraulic Lab., EPA, USGPO, Wash., D.C. 20402, Price-60¢, June, 1971.

"Hydrologic Model of a Wetland Forest--Details of Construction," (USDA For. Ser. Res. Note SE-166), USGPO, Wash., D.C. 20402, Oct., 1971.

"Uranium and Tritium as Natural Tracers in the Floridan Aquifer, Pub. No. 14," by J. K. Osmond, et al, WRRC, Univ. of Fla., Gainesville, Fla. 32601, Aug., 1971.

Miscellaneous

Annual Reports: State Water Resources Research Institutes

Univ. of Massachusetts
Oklahoma State Univ.

"Statewide Fisheries Research: Federal Aid in Fish Restoration Project F-19-3," by N.C. Wildlife Res. Comm., Div. of Inland Fish., Raleigh, N. C., June 30, 1971.

"Research Reports supported by Office of Water Resources Research under the Water Resources Research Act of 1964," by USDI, OWRR, WRSIC, Wash., D.C. 20240, July-Sept., 1971.

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