HISTORY OF
THE UNIVERSITIES COUNCIL ON HYDROLOGY (UCOH)
and
THE UNIVERSITIES COUNCIL
ON WATER RESOURCES (UCOWR)*

After 25 years, it is appropriate to review and document the history of the Universities Council on Water Resources (UCOWR) and its predecessor, the Universities Council on Hydrology (UCOH).

This statement of history involves background; organization and management; annual meetings; publications; co-sponsored meetings; special projects; liaison with congress and federal, state, and local agencies; friends of UCOWR; impacts; and accomplishments.

Background

The 1950s produced **a** number of activities which led to the development of UCOH and UCOWR. These included, but were not limited to:

- Increased interest in hydrology and water resources at all levels, nationally and internationally.
- Interest generated by the report of the Senate Select Committee on Water Resources, chaired by Senator Kerr.
- Formation of an ad hoc Committee on hydrology by the Federal Council for Science and Technology.
- Formation of a Committee on International Programs in Atmospheric Sciences and Hydrology by the National Academy of Sciences.
- Formation of a Committee on Education in Hydrology by the National Science Foundation.
- A report from the President's Scientific Office recommending that universities increase their activity and promote the field of hydrology.
- An upsurge of activity in meteorology and oceanography related to hydrology.

In addition there were a number of problems identified as being limitations on the growth of education in hydrology. These included:

- Little emphasis on hydrology as a science.
- No national affiliation of hydrologists.
- Hydrology as an interdisciplinary science is more difficult to promote.
- Limited educational programs in hydrology.
- Limited interest on the part of students to enter hydrology.
- Government agencies are the major employers of hydrologists.
- Research activity in hydrology was not commensurate with importance and need.

Early in 1962 Professors David Todd (UC-Berkeley) and Warren Hall (UC-Los Angeles) conceived the idea of an inter-university conference on hydrology with the intent to formalize an organization.

On April 18, 1962, Professor Hall, serving as Director, University of California Water Resources Center, appointed a Steering Committee consisting of D. K. Todd, Chairperson, R. K. Kinsley (Stanford University), N. K. Brooks (Cal Tech), and V. H. Scott (UC-Davis).

The Steering Committee proceeded to develop an agenda, presenters, a list of invited faculty members from 19 universities, and conference observers (see Table 1).

Table 1

Attendees, Inter-University Conference on Hydrology
Lake Arrowhead, California
August 7-9, 1962

E. F. Brater, University of Michigan
N. H. Brooks, California Institute of Technology
V. T. Chow, University of Illinois
N. A. Christensen, Cornell University
R. E. Dils, Colorado State University
W. A. Hall, University of California, Los Angeles
J. W. Harshbarger, University of Arizona
A. C. Ingersoll, University of Southern California
J. F. Kennedy, Massachusetts Institute of Technology
C. E. Kindsvater, Georgia Institute of Technology
E. M. Laursen, Michigan State University
A. T. Lenz, University of Wisconsin
R. K. Linsley, Stanford University
W. L. Moore, University of Texas
D. F. Peterson, Utah State University
S. D. Resnick, University of Arizona
V. H. Scott, University of California
D. K. Todd, University of California, Berkeley
C. C. Warnick, University of Idaho
M. G. Wolman, Johns Hopkins University

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The Conference was reported on in a paper, "Inter-University Conference on Hydrology," by David Todd which appeared in *Transaction,* AGU, v. 43, no. 4, December 1962. In Professor Todd's words the Conference "served as an opportunity to review the problems and needs in hydrology, to mobilize the thinking of university hydrologists and to plan a course of action."

It was agreed to define hydrology "as the science that treats the waters of the Earth, their occurrence, circulation and distribution, their chemical and physical properties, and their reaction with the environment, including their relation to living things. The domain of hydrology embraces the full life history of water on the Earth." It was also agreed that hydrology is an interdisciplinary science which is related to a diversity of traditional university departments, including agronomy, biology, engineering, forestry, geography, geology, irrigation and meteorology.

Closure was obtained on education and manpower, research, inter-university cooperation and a Memorandum of Understanding to establish UCOH. The Memorandum defined hyrology, membership of Institutions, functions that would and would not be included, Executive Board, meetings, dues, publications, and ratification.

Professor Todd, Chairperson of the Interim Executive Board, reported on November 26, 1962, that UCOH officially came into existence with acceptance of membership by 16 universities (see Table 2). The annual dues were $100. The UC Water Resources Center and Professor Hall served as the host institution and Executive Secretary, respectively.

Table 2

University Members
UCOH
November 26, 1962

California Institute of Technology
Colorado State University
Cornell University
Georgia Institute of Technology
Johns Hopkins University
Michigan State University
Stanford University
University of Arizona
University of California, Los Angeles
University of Idaho
University of Illinois
University of Iowa
University of Southern California
University of Washington
University of Wisconsin
Utah State University

During and following the Lake Arrowhead Conference, questions were raised about expanding the scope of UCOH to include all disciplines in water resources.

Consequently, at the 1964 Annual Meeting of UCOH in Estes Park, Colorado, much debate took place on the question of expanding the scope. There was agreement that UCOH should become the Universities Council on Water Resources (UCOWR), and the Council By-Laws were broadened to all disciplines.

Organization and Management

The Council has evolved as a voluntary organization of member universities engaged in education, research, public service, international activities, and legislative pursuits relevant to all aspects of water resources. Each member university is entitled to four voting delegates to the Council.

The Council is administered by a nine-member Board of Directors elected by the delegates at the Annual Meeting. The Board members serve on a rotational plan of three-year terms.

The Board of Directors elects its President and Vice-Chair. A list of Presidents is given in Table 3. The Board appoints the Chairperson of each Standing Committee and confirms the membership of the committee along with a four-person management group.

Table 3

Presidents of UCOH/UCOWR

Date	*Name*	*University*
1987/88	Miguel Medina, Jr.	Duke University
1986/87	Warren Viessman, Jr.	University of Florida
1985/86	Ernest Smerdon	University of Texas at Austin
1984/85	Yacov Y. Haimes	Case Western Reserve University
1983/84	James Heaney	University of Florida
1982/83	David J. Allee	Cornell University
1981/82	Robert M. Sweazy	Texas Tech University
1980/81	Ronald M. North	University of Georgia
1979/80	Henry P. Caulfield	Colorado State University
1978/79	Daniel D. Evans	University of Arizona
1976/78	William Whipple, Jr.	Rutgers-The State University
1975/76	William Walker	Virginia Polytechnic Institute
1973/75	Ernest T. Smerdon	University of Florida
1972/73	David J. Allee	Cornell University
1969/72	David H. Howells	North Carolina State University
1968/69	Allen F. Agnew	Indiana University
1966/68	Warren A. Hall	University of California/L.A.
1966	Stephen C. Smith	Colorado State University
1965	Warren A. Hall	University of California/L.A.
1964/65	Dean F. Peterson	Utah State University
1962/64	David Todd	University of California/ Berkeley

The Board is also responsible for selecting the Executive Secretary and the Host University for the Office of Executive Secretary. Persons who have served in this capacity are listed in Table 4.

Table 4

Executive Secretaries

Date	*Name*	*University*
1987/	Duane D. Baumann	Southern Illinois University at Carbondale
1980/87	William L. Powers	University of Nebraska
1979/80	Gary L. Lewis	University of Nebraska
1975/79	Millard W. Hall	University of Nebraska
1970/75	Warren Viessman, Jr.	University of Nebraska
1966/70	William Butcher	University of Texas at Austin
1962/66	Warren A. Hall	University of California/L.A.

Finally, the Board has appointed Task Committees to address specific water resources education, research, and public service issues.

During the earlier meetings of the Council, delegates attended formal presentations on topics of interest and participated in committee discussions. An additional activity was the passage of resolutions pertaining to the activities of water resource agencies and associations affecting university water resources research and education. These resolutions were published and distributed each year after the Annual Meeting held in late July and early August.

During 1986-1987, the practice of adopting resolutions at Annual Meetings for the purpose of expressing support of a water resources activity was replaced with a published "Statement of Policy." The Policy Statement is the foundation of the Council activities and is the basis upon which issue analyses and position papers are developed. It is revised at each Annual Meeting.

Also in 1987, the Standard Operating Procedures were adopted to clarify the responsibilities of the Board of Directors, Committee Chairs, the Executive Director (formerly Executive Secretary), and delegates to UCOWR and to set forth procedures to be followed by them in discharging their responsibilities.

Each Annual Meeting has a theme around which the program is developed. A list of themes is given in Table 5.

As the membership in the Council increased, it became necessary for communication among the delegates. So in September, 1964, a newsletter entitled *Update* was published. It was initially published quarterly.

In 1980 the Universities Council on Water Resources was incorporated and officially became known as UCOWR, Inc. At this time, the Council applied for and received tax exempt status as a non-profit organization.

Table 5

Themes of Annual Meetings

Year	*Theme*
1987	University Participation in the Water Resources Regulatory and Management Processes
1986	University Participation in Public Decision Making on Water Issues
1985	University Partnerships in Water Resources: Industry, State and Local Government, Citizens
1984	Water Resources Management: Educational Prerequisite
1983	Water Development to Management: The Universities' Role
1982	University Leadership in Water Resources Programs
1981	Implications of National Priority Reports for Water Resources Education and Research
1980	Water Resources Planning in the 80's—University Involvement
1979	Significance of University Water Research and Education
1978	The Nation's Water Crises: University Responsibilities in Water Management
1977	Into the Third Century: U.S. Water Policy
1976	Water Resources Research and Education—Bicentennial and Beyond
1975	The Challenges of Water Resources Education
1974	Energy, Environment and Water Resources
1973	The University and Public Policy in Water Resources
1972	Changing Education Needs in the Field of Environmental Resources
1971	The Role and Relevance of University Water Research
1970	The University's Role in National Water Policy
1969	The Service Functions of Universities in Water Resources
1968	Federal-State Water Resources: What Can Universities Contribute
1967	Challenging Issues on Water Resources
1966	The Responsibilities of Universities and Water Resources Education
1965	— —
1964	International Hydrological Decade
1963	Educational Programs in Hydrology

Recognition of the Council has developed to the point where the office of the Executive Director receives correspondence each week from non-UCOWR inquirers asking questions about topics such as career opportunities, location of research data, names of experts in the various water resources fields, legislation, and names of associations interested in water resources.

Activities and Accomplishments

During the 1960s and early 1970s, the Council conducted several surveys of the status of water resources education and future demands for trained scientists in the field. A survey on the status of hydrologic education was initiated at the first conference in 1962. In early 1966, the report "Education in Hydrology, United States Universities" was a U.S. contribution to the International Hydro-

logical Decade. Data from these early surveys were used in testimony in support of the Water Resources Research Act of 1964 and later in support of appropriation requests to support research and education authorized by the Act. In the early 1970s, the Council helped develop an option paper on water resources research used by the President of the United States in his national water policy review. In 1972 the Council assisted the Office of Water Resources Research of the U.S. Department of Interior (the agency responsible for administering the Water Resources Research Act of 1964) in evaluating national water research needs. In 1981 the Council helped to evaluate a review of federal water resources research published by the National Research Council entitled "An Assessment of the Use of Models for Water Resources Management, Planning and Policy."

One of the first conferences sponsored by the Council was the "Water for Peace Conference in 1967." Since that time, the Council has sponsored or co-sponsored several conferences and workshops. These include the 1976 International Water Resources Education Workshop held in Honolulu, Hawaii, and the U.S. National Conference of Water held in St. Louis, Missouri, in 1977. In 1985 the Council co-sponsored with the National Science Foundation and the Environmental Protection agency a "National Conference on Water Resources Research" at the National 4-H Center in Chevy Chase, Maryland. Since 1981, the Council has cosponsored the "Annual One-Week Short Course on Hierarchical-Multiobjective Approach in Water Resources Planning and Management." The Council continues to co-sponsor a series of "Regional Meetings of Water Management" organized by the U.S. Committee on Irrigation and Drainage. The latest conference co-sponsored by the Council with the Engineering Foundation was held in May, 1987, entitled "The Role of the Social-Behavioral Sciences in Water Resources Management."

In 1971 a report of the Task Force on Water Resources Evaluation—"Evaluation Processes in Water Resources Management and Development"—said that "reshaping research concepts and methodologies will call for involvement and interaction of researchers from the total spectrum of disciplines—the Universities must play a leading role in fostering interdisciplinary cooperation for the purpose of reorienting water resources evaluation processes." The report which was sponsored by the Office of Water Resources Research, U.S. Department of the Interior, concluded that "interregionalinstitutional research will strengthen the overall research effort in water resources evaluation and provide a protective umbrella for projects that might be regarded as too controversial for a specific investigator of an institution to undertake."

In a 1976 report prepared by Ernest A. Engelbert of the University of California at Los Angeles and the UCOWR Research Task Group Chair, called for "greater cooperation between and among universities and governmental agencies if the regional research process for water resources is to yield maximum dividends." The report indicated that during the years from 1964 to 1972, the Office of Water Resources and Technology had sponsored 2,706 research projects and distributed nearly $70 million to university institutions, other research organizations, and investigators in both the public and private sectors.

Over the years, the Council has produced several publications, the most recent of which includes a companion package of three publications especially designed for the student. These are "Course Listings in Water Resources," "Graduate Studies in Water Resources," and "Career Opportunities in Water Resources." Another publication found to be of assistance to the student has been "Metric Measurements in Water Resources Engineering."
In 1982 the Council developed a computerized Expertise Directory. It is a list of staff from member universities showing their interests, expertise and experience. The Directory is used to direct inquiries from prospective students, governmental agencies, and consulting firms. Starting in 1983, the Directory was used to select UCOWR delegates to review the proposals submitted for funding under Section 105 of the Water Resources Research Act of 1984 (P.L. 98-242).

In 1981 the Council established awards for outstanding Ph.D. dissertations in the water resources fields of Physical and Engineering Sciences. Awards were made for about two years and then discontinued because of the apparent lack of knowledge by students about the awards program. There is renewed discussion to reestablish the awards in the near future.

In 1983 the Council established an honor to recognize and honor delegates who have made substantial contributions in time and effort toward the goals of the Council. The first persons to be honored as "Friends of UCOWR" were the attendees at the first Council meeting in 1962. Each year the Council selects those to be designated as "Friends of UCOWR" and their names are printed on the inside of the front cover of each issue of the now renamed newsletter *Water Resources Update* (see this issue for current list).

In 1984 a program was established for fellowships for the staff of universities to spend six months to a year with a federal water agency. This UCOWR/Agency fellowship is awarded to as many as three scientists each year. Expenses for the administration of the program are paid for by contributions from the agencies involved.

Summary

On this 25th anniversary of the founding of the Council, we can look back on many accomplishments of the organization. We see that it has had a positive influence on water resources, research, and education programs at the university level and on research at the national level. These activities have also stimulated additional support in many states. This has been accomplished by the exchange of ideas at the annual meetings, activities of committees, and testimony of its officers and delegates on national legislation, resolutions and policies.

WATER RESOURCES ISSUES:
SAFE DRINKING WATER ACT AMENDMENTS OF 1986

Joseph A. Cotruvo*

After months of deliberation, the United States House and Senate passed final legislation to renew and amend the 1974 Safe Drinking Water Act. The Amendments restricted part of the Environmental Protection Agency's discretion in setting standards for contaminants in drinking water. Previously, EPA had set primary standards for 26 substances including inorganic and organic chemicals, radionuclides and biological contaminants, plus 12 secondary standards and monitoring requirements for sodium and corrosion.

In addition to requiring the EPA to set additional standards for contaminants possibly in drinking water, the amended Act gave the Agency the power to issue administrative orders to force water systems operators to comply with federal standards. The Amendments also create a ground-water protection program which requires states to develop plans to protect public drinking water system wellfields from contamination. Other provisions in the Amendments require the EPA to develop regulations requiring the disinfection of drinking water and filtering of surface supplies, and to provide a schedule for monitoring other contaminants which may pose a health risk. They also forbid use of lead-containing materials in solder and plumbing after June 1988. A brief examination will be made of the timetable and standard-setting process, the monitoring requirements, the filtration and disinfection criteria, the variances and exemptions from the requirements, and the wellfield protection program.

Timetable and Standard-Setting

Included in the 1986 Amendments is a list of 83 specific contaminants which were identified by EPA as candidates in advance notices of proposed rulemaking in 1982 and 1983. Under the legislation, EPA will set Maximum Contaminant Level Goals (formerly called "Recommended Maximum Contaminant Levels"), and Maximum Contaminant Levels for nine of the listed contaminants within twelve months of enactment. The agency is further required to set standards for 40 additional listed contaminants in 24 months from the date of enactment, and the remaining 34 in 36 months from the date of enactment (by 1989). In addition, the SDWA requires that every three years EPA list contaminants that present public health concerns which need to be regulated.

The Maximum Contaminant Level Goals (MCLGs) are to be set at a level "... at which no known or anticipated adverse effects on the health of persons occur and which allows an adequate margin of safety." The Maximum Contaminant Levels (MCLs) are to be set as close to the MCLGs as is "feasible." The definition of feasible is "... within the use of best technology, treatment techniques and other means, which the Administrator finds, after examination for efficacy under field conditions and not solely under laboratory conditions, are available (taking costs into consideration)." The Amendments identify granular activated carbon filters as a "feasible" treatment for the removal of synthetic organic chemicals. Maximum Contamination Levels for synthetic organic chemicals will be based on the efficiency with which these filters can remove them. However, EPA may designate another technology as the "best available" for meeting MCL's as long as it is at least as effective as activated carbon. Included in its issuance of MCLGs and MCLs, EPA must designate the best treatment technique, within the

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