



Wyoming Hydrogram

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Wyoming Water Research Center

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Wet Side Story

Steven P. Gloss

These are busy times at the Wyoming Water Research Center. We recently completed our review of research proposals and made funding recommendations on four studies to the U. S. Geological Survey for our federal grants program. A list of those projects is included under the Splash section of this newsletter. We are currently reviewing 21 additional proposals for funding consideration under our state-funded grants program. Each of these proposals have been sent to state agencies and faculty

members at two other universities for "peer" review. We will then rank each proposal using the external reviews and our own evaluation, before making funding recommendations to the Research Review and Priorities Committee later this month.

We are also pleased to be sponsoring, in cooperation with several colleges at UW, a conference on "Global Climate Change: Impacts and Opportunities for Wyoming and the Region", to be held on the UW campus on April 24 and 25. I encourage anyone interested to attend all or a portion of this meeting. Speakers will be addressing topics of great importance to this area which may be dramati-

cally affected by a changing climate. Each reader of the *Hydrogram* should have received a copy of the program for this conference. If you did not, or would like additional copies, please contact the Water Center.

Finally, I hope that you gain some new knowledge from our feature topic in this issue: Nonpoint Source Pollution. This is a very timely and important subject for Wyoming as you'll see from the article and Alan Edwards guest editorial. The degree of nonpoint source pollution is largely a reflection of how well we manage and insure the integrity of our entire landscape, not just our streams and lakes.

My Sediments Exactly

Alan Edwards, Director
Department of Environmental Quality

The DEQ Role in Controlling Nonpoint Sources of Pollution
The Department of Environmental Quality, Water Quality Division is the designated state agency for water quality management. As such, the Division is responsible for a variety of programs mandated by the Wyoming Environmental Quality Act, the Clean Water Act and the Resource Conservation and Recovery Act. States are required to operate and maintain a water quality management program in order to receive a variety of program implementation funds from the U. S. Environmental Protection Agency (EPA).

The 1987 amendments to the Clean Water Act strengthened nonpoint source pollution control through Section 319. The Governor of each state is required to submit to the administrator of the EPA a management plan for controlling nonpoint sources of pollution. Failure to submit a plan shall result in the EPA preparing and implement-

ing a plan in the state.

Although nonpoint sources are the most widespread pollution problem in the State of Wyoming, they are also the most difficult to quantify and correct. Past attempts have not always been successful due to lack of funding, complex land ownership patterns and lack of comprehensive planning between local, state, federal, public and private interests. In order to correct nonpoint source problems, structural solutions are not always effective and solutions frequently must be developed which depend upon natural processes or modification of practices which have been used for decades.

In order for a comprehensive nonpoint source program to be effective, it is essential to have cooperation, commitment and participation of all agencies who manage land or conduct activities which may in some way affect water quality. Additionally, no plan can be effective without the support of user groups, interest groups and the public at large. The Department of Environmental Quality is developing a plan built upon participation of management agencies. With input from the various organizations, a draft management plan is being developed which will

be submitted for public review and comment. Public involvement in the process is crucial to program success.

The Wyoming Nonpoint Source Management Plan will address roles and responsibilities, financing, Best Management Practices, schedules for implementation and a priority ranking system for determining distribution of funds. Up to \$1,000,000 will be available in the coming year for projects which demonstrate the effectiveness of Best Management Practices on surface and groundwater quality, address educational concerns identified in the management plan, or address groundwater quality concerns. The required 40% local match can be at least partially contributed through in kind services. A small amount of money which does not require the high rate of match will also be available.

Work groups have been established to review the Best Management Practices for applicability to Wyoming's unique environment, and an interdisciplinary team will be formed to review progress and need for amendment to the plan. The goal of the Department of Environmental Quality in this effort is

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to develop a coordinated, workable, useful plan which addresses the concerns of all affected parties yet assures that appropriate mechanisms are in place to correct nonpoint source problems. The draft plan should be available in early May. Public information and review will occur May through mid-July, with the final plan adoption, certification and approval in August.

Anyone interested in being put on the mailing list for the Nonpoint Source Management Plan, Best Management Practices or the list for submitting proposals for funding should contact the Water Quality Division at (307) 777-7781.

Interested in expressing your thoughts and views on a water issue or concern? The *Hydrogram* guest editorial, *My Sediments Exactly*, is available for that purpose. If interested, please contact Dr. Steven Gloss, Director, Wyoming Water Research Center, Box 3067, University of Wyoming, Laramie, Wyoming 82071. Telephone (307) 766-2143.

Mainstream**Nonpoint Source Pollution**

The first legislation to control water pollution was enacted in 1899. It prohibits the discharge of waste into harbors and on river banks. In recent years the Congress and State Legislatures have enacted numerous regulations to help prevent water pollution and to help clean up water already contaminated. The Clean Water Act, passed in 1977, required regulatory agencies to concentrate primarily on point source pollution; end-of-the-pipe sources which are visible, discrete, identifiable, and easily regulated with Federal and State permits.

The 1987 amendments to the Clean Water Act strengthened nonpoint source (NPS) pollution control through Sections 319, 205(j) and Title VI. NPS pollution is diffuse and often hard to trace to

its source. It normally is associated with construction, silviculture, agriculture, mining, urban runoff, and other activities. NPS pollution can't be regulated as easily as point source pollution. It is the direct result of past and present land use practices, so many of the solutions lie in finding more efficient, rational ways to manage the land. Since direct Federal regulation is not a major factor in local land use decisions, State and local governments often need new institutional arrangements to deal effectively with nonpoint sources.

For point source pollution, the traditional regulatory solution is "top-down", the Federal and State governments impose specific requirements on water users. Since NPS pollution is the result of land use, the solutions affect the public at large, and tend to be "bottom up." This requires an informed public and broad-based coalitions to generate support for local or State action.

The Environmental Protection Agency in 1986 reported to Congress that the national NPS pollution problem is large, complex, and dynamic. We need to be forward thinking about the NPS problem because, unlike the point sources that are fixed in one place, the NPS problem shifts beneath us constantly, they reported.

The 1987 Amendments give state and local governments the front line responsibilities for assessing their waters and devising appropriate solutions to their NPS problems. Perhaps the biggest hurdle of all is that the words "nonpoint source" are linked with the sensitive words "land use," the control of which lies largely in the purview of state and local governments. EPA's role is to support and reinforce state and local governments as they make difficult decisions that affect water quality, to improve their knowledge of sound land use practices, and to provide the scientific basis on which they make these public policy decisions. Federal loan and grant funds will be available to assist state and local governments, conservation districts, individuals, farmers, and businesses in managing NPS pollution.

In the article *My Sediments Exactly*, Alan Edwards, Director of the Wyoming Department of Environmental Quality (DEQ), states that the Water Quality Division of DEQ is the designated agency in Wyoming to address NPS pollution. Mr. Edwards outlines procedures and a timetable for developing a Wyoming NPS pollution management plan.

DEQ issued a report in October of 1988 entitled "Wyoming 1988 Water Quality Assessment." The report indicates that, generally, water quality in Wyoming remains good to excellent. Significant improvements have been made in reducing the water pollution impacts from municipal and most industrial point sources. Additional biomonitoring requirements have been placed on oil processors in the state that discharge to live water. This should eliminate the majority of the remaining industrial pollution problems by 1992. NPS pollution continues to have major impacts on water quality in Wyoming, however; from the limited data available on trends, it appears that waterbodies affected by point sources have stable or improving trends while waterbodies affected by nonpoint sources have generally stable or declining trends.

Suspended sediment from rangelands, riparian grazing, road construction, irrigated cropland, and natural sources is the most common water quality impact to rivers and streams in the state. Salinity, frequently from oil processing discharge, as well as habitat and channel alterations from a variety of human activities in riparian areas also impact water quality and water uses.

The most common lake water quality problems in Wyoming are mineral and organic nutrients reducing dissolved oxygen and sedimentation. Excessive nutrients from croplands, riparian grazing, and phosphate soils combine with often extreme water level fluctuations to impact fishery and recreational uses at some lakes. Suspended sediments and siltation also impair the uses of water in some lakes. As Mr. Edwards

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indicated, anyone interested in the NPS management plan in Wyoming can receive information from DEQ.

Research projects that relate to water quality which are presently underway at the Wyoming Water Research Center are:

Evaluating Riparian Zones as Natural Dams to Modify Water Yield, Quality, and Erosion. (Muddy Creek)

Chemistry of Molybdenum in Alkaline Mine Spoils of Wyoming.

Importance of Chemical Weathering, Soil-Water Interaction, and In-Lake Processing as Controls on Surface Water Chemistry at West Glacier Lake, Snowy Range, Wyoming.

Chemical, Physical, and Biological Characteristics Which Control Selenium Form and Distribution in Soils and Plants Across Landscapes.

See also USGS projects under *Splash*.

Splash

- **Water Institute for Teachers**

A two week Water Institute for Teachers will be held during the summer school session at the University of Wyoming. The Institute is scheduled for July 17 to 28.

The Institute gives teachers the opportunity to expand their knowledge about water and water issues in Wyoming such as water supplies, water quality, legal issues, and watershed management. Classroom sessions, field trips, and hands-on activities will be utilized and teachers will be given the opportunity to develop concepts and activities to add to their existing curricula.

Those who complete the Institute will receive two semester hours of credit in Natural Science 680. Tuition scholarships are also available. Registration forms will be available at schools throughout Wyoming. For further information please contact the WWRC.

- **Award**

The Wyoming Water Research Center was awarded the National Forest Partner Award in apprecia-

tion for valuable cooperation and research to enable implementation of "Rise to the Future Program" in the Medicine Bow National Forest and Thunder Bow National Grassland. The award was presented to WWRC by Gary Heath, Forest Supervisor and Ronald Wilcox, District Ranger.

- **Casper Junior High School Program**

The Water Research Center in cooperation with the Department of Geography and Recreation at UW will be presenting lectures on water resources to all ninth grade science classes in the Casper Public School System. The lectures are designed to acquaint students with the water resources of Wyoming, their management, and conflict resolution. Information will be presented by Don Brosz, Richard Marston, and Ron Beiswenger on April 19, 20, 21, and should reach over 900 ninth grade students.

- **25th Anniversary**

The National Association of Water Institute Directors will hold their annual meeting in Washington D.C. April 26-28 to celebrate the 25th Anniversary of the Water Resources Research Institute program. Created by Congress in 1964 as part of the Water Research Act, the program has been a highly successful, cost effective means of training water resource professionals and conducting research on the water resources of the Nation. A congressional reception will be held during the meeting featuring a slide/tape presentation on the computerized Water Resources Data System in Wyoming operated by the WWRC.

- **North Platte Lawsuit**

The Special Master appointed by the U.S. Supreme Court to address the North Platte River lawsuit between Nebraska and Wyoming has denied the motion of Wyoming to dismiss the 1986 lawsuit. Nebraska asked the High Court to rule out the current management and development plans of Wyoming on the North Platte River by enforcing a 1945 decree in which the Supreme Court divided up the river waters between Wyoming, Colorado, and Nebraska. Wyoming argues that its management plans of the North Platte all follow the decree or fit within its exceptions. Wyoming

can appeal the decision of the Special Master or seek a full-court hearing.

- **Water Contracts**

The first major water issue to be faced by the new Secretary of the Interior, Manuel Lujan Jr., involves the renewal of 40 year "water utility" contracts in California.

The first such contracts up for renewal involve service contractors within the Friant Division of the Central Valley Project. Friant Division growers generate over \$2.1 billion in gross agricultural production each year.

The National Resources Defense Counsel recently brought suit against the Department of Interior charging that the Department must do an Environmental Impact Statement (EIS) on the renewal of the Friant Unit Contracts.

Congress, in 1956, amended the Reclamation Projects Act of 1939 to provide for renewal of the contracts and assurance of a continuous supply of water. The 1956 Act states that the Secretary of the Interior must provide the contracting party with a long-term contract, ability to renew, and a permanent right to a stated share or quantity of the project's available water supply for beneficial use.

- **U.S. Geological Survey Projects Fiscal Year 1989**

WWRC recommended the following studies to the USGS for the 1989-90 grants program.

"Development of a Chemical and Biological Method to Reclaim Alkaline Solid Wastes." (Katta J. Reddy, Wyoming Water Research Center, Stephen E. Williams, UW Department of Plant, Soil, and Insect Sciences)

"Uncertainty Analysis of Water Quality Models and its Applications to Risk Assessment and Management." (Yeou-Koung Tung, Wyoming Water Research Center and UW Department of Statistics, Dr. Shag-Di Shih, UW Department of Mathematics)

"Transformation and Stimulated Plant Uptake of Selenium by Soil Microorganisms." (Stephen E. Williams, UW Department of Plant, Soil, and Insect Sciences)

"Assessment of Potential En-

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Environmental Impact of Saline Oil Field Discharges into Salt Creek and the Powder River, Wyoming." (Harold Bergman, Sheryl L. Hill, Joseph D. Hernandez, UW Department of Zoology and Physiology)

Wyoming Wet Ones

Featuring

Steven P. Gloss, Director,
Water Research Center.

Dr. Gloss has been Director of WWRC since December, 1987. He moved to the University of Wyoming after spending nine years in the Department of Natural Resources at Cornell University. While at Cornell he was affiliated with the U.S. Fish and Wildlife Service's Cooperative Fish and Wildlife Research Unit. Dr. Gloss received his Ph. D. from the University of New Mexico and a Master's degree from South Dakota State University. Prior to working at Cornell, he had spent the previous twelve years in research positions in South Dakota, Utah, Arizona, and New Mexico, including nearly ten years working on the Colorado River system. Dr. Gloss is not a stranger to western water resource issues.

While Dr. Gloss' personal research activities have emphasized the effects of man's activities on water resources (particularly water quality and fisheries), he has a strong history of interdisciplinary research administration. He coordinated

several multidisciplinary studies of acid precipitation in the Northeast, working with Resource Economists, Ecologists, Foresters, Microbiologists, Hydrologists, Engineers, Simulation Modelers, and Geochemists. Prior to leaving Cornell he was directing a five million dollar research effort, The Lake Acidification Mitigation Project, funded by the Electric Power Research Institute. The project involved four different universities plus the U. S. Geological Survey and emphasized a comprehensive watershed level approach to mitigation problems. He has authored over 25 scientific publications in various areas related to water resources and numerous technical reports.

Since becoming Director, Dr. Gloss has sought to increase awareness and understanding of the Center's programs at the University of Wyoming as well as with state agencies and the general public. He has promoted increased membership and involvement on the Center's Citizen's Water Issues Advisory Council and placed an increased emphasis on extension and public communication/education activities. However, he also clearly recognizes the responsibility of the WWRC research program to meet current and future informational needs of the State in order to best manage our water resources. In this regard the Director emphasizes a high quality research program which strives

to provide a balance in addressing the complex issues associated with water resources in Wyoming.

Dr. Gloss brings experience and talent in working with a diversity of people in academia, state and federal agencies, and the private sector, as well as broad geographical expertise to the WWRC. By its very nature the study of water and water resource problems is interdisciplinary. His team building and administrative experience provide the leadership necessary to effectively coordinate the water research, service, extension, and educational program of the Wyoming Water Research Center.

On a personal note, Steve enjoys hunting, fishing, camping, cross-country skiing, and is reputed to be a somewhat avid sports fan. He, his wife Marie, and two daughters, Nicole and Alexis, reside near Centennial, Wyoming.

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