2 7 T H  A N N U A L

# Water Resources Conference

F I N A L  P R O G R A M

## 1994 Water Resources Planning Committee

*John Boynton*, Minnesota Department of Transportation

*Kenneth Brooks*, Department of Forest Resources, University of Minnesota

*Pat Foley*, U.S. Army Corps of Engineers

*David Ford*, Minnesota Department of Natural Resources

*Sonia Jacobsen*, Soil Conservation Service, U.S. Department of Agriculture

*Rocky J. Keehn*, SEH, Inc., St. Paul

*John M. Kurdziel*, North Star Concrete Co., Apple Valley

*Nels Nelson*, Barr Engineering, Minneapolis

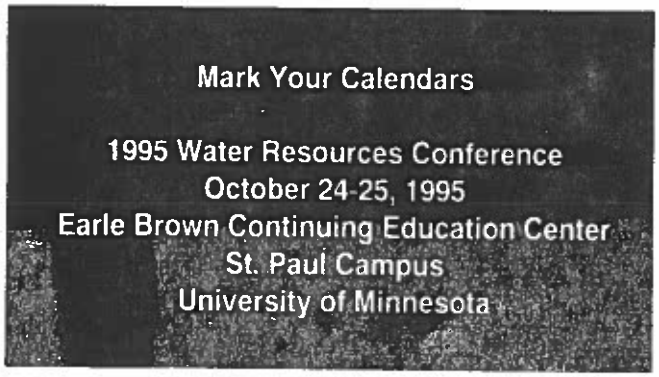
*Shelly Pederson*, City of Bloomington

*Gene Soderbeck*, Conference Chair, Minnesota Pollution Control Agency

*Warren White*, St. Croix Falls, Wisconsin

*Steve Woods*, Montgomery Watson, Minneapolis

*Paul Wotzka*, Minnesota Department of Agriculture




## PROGRAM AT A GLANCE

### Tuesday, October 25

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|---|---|
| 8:30 a.m. | Welcome<br>Minnesota and Mississippi Rivers<br>The State of the Upper Mississippi River<br>The Mississippi River, A Great Ecosystem in Decline<br>Regulatory Aspects of the Lower Minnesota River<br>The Water Quality Incentives Project |
| 12:00 p.m. | Lunch<br>The Mississippi River — Its History |
| 1:30 | A. Rural River Issues<br>B. Floods and Hydraulic Structures |
| 4:25 | Adjourn |
| 4:30 | Social Hour |

### Wednesday, October 26

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|---|---|
| 8:30 a.m. | Wetland Impacts on Flooding<br>Troubleshooting Construction and O & M Considerations for Wetland Restoration Sites |
| 10:30 | A. Plants and Wildlife<br>B. Lake Protection |
| 12:00 p.m. | Lunch<br>Columbia Heights 45 Million Gallon Treated Water Reservoir |
| 1:30 | A. Sediment<br>B. City Issues |
| 3:15 | Adjourn |

## TUESDAY, OCTOBER 25, 1994

8:00 a.m. Final Registration

### General Session

Moderators: *Gene Soderbeck, Sonia Jacobsen*

8:30 a.m. **Minnesota and Mississippi River: Water Quality Issues**
*Ron Nargang,* Deputy Commissioner, Minnesota Department of Natural Resources

9:15 **The State of the Upper Mississippi River**
*Stewart Crosby,* Mississippi River Program Manager, Freshwater Foundation, Navarre

9:45 **The Mississippi River, A Great Ecosystem in Decline**
*Steve Johnson,* River Management Supervisor, Minnesota Department of Natural Resources

10:15 Break

10:45 **Regulatory Aspects of the Lower Minnesota River**
*Rebecca Flood,* Manager, Regulatory Compliance Division, Metropolitan Council — Wastewater Services

11:30 **The Water Quality Incentives Project: The First Year**
*James L. Frost,* Senior Environmental Engineer, Metropolitan Council

12:15 p.m. Lunch

Luncheon Session
**The Mississippi River--Its History**
*Scott Anfinson,* Minnesota Historical Society

## CONCURRENT SESSIONS

### Session A: Rural River Issues
Room 135 A/C

Moderators: *Paul Wotzka, Gene Soderbeck*

1:30 p.m. **A Land Use Analysis of Nonpoint Source Pollution in the Minnesota River Basin**
*Timothy A. Koehler,* Water Resources Staff Leader, and *Peter D. Cooper,* Hydraulic Engineer, USDA, Soil Conservation Service, St. Paul
The Minnesota River Assessment Project (MRAP) Level II and Use Analysis looked at soil and nutrient losses and the effects of residue and nutrient management on cropland fields within the Minnesota River Basin. Field and watershed scale evaluations were based on computer modeling techniques. Input data was developed from extensive on-site inventories performed by Soil and Water Conservation Districts.

2:00 **A Farmer's Perspective on the Minnesota River**
*Earl Renneke,* Chair, Minnesota River Agricultural Team (MRAT)

The presenter will discuss MRAT, current concerns, and future issues.

### Session B: Floods and Hydraulic Structures
Room 135 B/D

Moderators: *Pat Foley, David Ford*

1:30 p.m. **The Great Flood of 1993: The Flood Fight in the Quincy, Illinois Area**
*Paul D. Madison,* Geotechnical Engineer, U.S. Army Corps of Engineers, St. Paul District

In the Quincy, Illinois area, local agricultural districts have levees designed to protect their communities and farms from 50-year flood events. This talk will show examples of how the local volunteers modified these levees to protect them from the record 500-year flood. Methods used to combat the extreme stresses placed on these raised levees and others will also be described.

2:00 **Forecasting the Great Flood of 1993**
*Dean Braatz,* Hydrologist in Charge, North Central River Forecast Center

The discussion will focus on the hydrologic models used operationally in the National Weather Service to forecast floods. Challenges encountered due to data and processing constraints will be highlighted, along with operational challenges, including reasonable sub-basin runoff, exceeded rating curves, over-topped levees and heavy rainfall vs. crest timing. A review of the 1993 flood verification will provide information on the forecast bias and associated error at different locations.

## CONCURRENT SESSIONS

### Session A: Rural River Issues

2:30 **The Minnesota River--A Natural Sewer?**
*Lawrence Samstad,* P.E., Itasca Engineering, Shakopee

Subjects to be discussed will include: changes in natural occurrences that influence today's evaluation of the Minnesota River; flooding problems and potentials; water quality considerations, including sewage, bacteria, and soil problems; chemical and bacterial problems and methods of control; and soil pollution problems and methods of control.

2:50 Break

3:05 **Feedlots' Impact on Water Quality**
*Randy Ellingboe,* Staff Engineer, Feedlot Program, MPCA

Animal feedlots have long been identified as a potentially significant source of water pollution. Minnesota has had a regulatory program in place since 1971 to address these problems. This talk will discuss how feedlots are evaluated with respect to their pollution potential. In the last legislative session, feedlot pollution control was addressed through an interagency legislative proposal. The current status of the state permit program will be discussed, along with educational and technical assistance efforts and research topics.

3:30 **Ag Tile Drains, Storm Events, and Water Quality**
*Suzanne Magdalene, E. Calvin Alexander, Jr. and Scott C. Alexander,* Department of Geology and Geophysics, University of Minnesota; *Tim Larson,* Minnesota Pollution Control Agency

This project compares the water quality of buried tile line flow to direct runoff into surface tile inlets. Discharges respond to recharge events on time-scales of minutes to hours. Tile lines have lower sediment loads and higher nitrate levels than surface inlets. Tracers demonstrate that precipitation can pick up soluble materials from the soil surface and reach the buried tile lines on a time-scale of minutes.

3:55 **Assessing the Potential Impact of Conservation Reserve Program Contract Expirations on Soil Erosion and Water Quality Using a Geographic System**
*Lee Ganske* and *Edward Weir,* Water Quality Specialists, Minnesota Pollution Control Agency, Rochester

Conservation Reserve Program (CRP) land accounts for approximately 10% of the non-lake area of the 6,100 hectare Jefferson-German Watershed. A geographic information system, the universal soil loss equation, and a lake water quality model (BATHTUB) were used to assess the impact of converting some or all of the CRP land to other uses.

4:25 Adjourn

4:30 Social Hour

### Session B: Floods and Hydraulic Structures

2:30 **Changes in 100-Year Discharge Estimates with Varying Period of Record on Minnesota Streams**
*George H. Carlson,* Hydrologist/Surface-Water Specialist, USGS, Mounds View

The flood history of Minnesota streams includes a period of 50 years with no great floods, followed by 20 years during which several notable floods occurred. Results of standard flood frequency analysis of selected station records show that floods of 1950-69 increased the 100-year flood estimate, and floods since 1969 generally have reduced those estimates.

2:50 Break

3:05 **Design Considerations for a Stormwater Drainage Chute**
*John H. Kittelson,* Senior Staff Engineer and *Larry G. Haukos,* Project Engineer, Woodward-Clyde Consultants, Minneapolis

Slope constraints and differential settlement in landfill closure design can often render traditional stormwater drainage channel lining materials unacceptable. This paper describes the use of an articulated cable-tied concrete liner material used in the closure design of Pine Bend Landfill, Inver Grove Heights. Design considerations, construction methods, and cost comparisons will be presented.

3:30 **Split Rock Creek Dam Repair and Modification**
*Thomas F. Prehoda,* P.E., Barr Engineering Company, Minneapolis

This paper presents an historical perspective of Split Rock Creek Dam, an evaluation of the 1993 flood of record that resulted in failure of the dam, and the design and construction considerations for the rapid-pace repair and modification of the dam. This repair and modification illustrates the importance of a detailed investigation, flexibility of design, and innovative engineering. The project was a cooperative effort of the State Legislature, Minnesota Department of Natural Resources, Pipestone County, and Barr Engineering Company.

3:55 **Minnesota Bridges and Scour**
*John L. Boynton,* P.E., Assistant Hydraulic Engineer, Mn/DOT

Mn/DOT is analyzing its bridges for vulnerability to scour. What is being done and what are the results?

4:25 Adjourn

4:30 Social Hour

## WEDNESDAY, OCTOBER 26, 1994

### General Session

Moderators: *Nels Nelson, Kenneth Brooks*

8:30 a.m. **Wetland Impacts on Flooding**
*Peter D. Cooper,* Hydraulic Engineer, USDA., Soil Conservation Service, St. Paul

A modeling study was done for the Redwood River in southwestern Minnesota that addresses the question, "If wetlands within a large watershed were to be restored, would main stem peak discharges be reduced?"

9:15 **Troubleshooting Construction and O & M Considerations for Wetland Restoration Sites**
*John Braastad,* Wildlife and Private Lands Biologist, U.S. Fish and Wildlife Service, Windom

Braastad's lengthy experience constructing wetland restoration sites is presented with slides, depicting what to avoid and what to be sure to do. He'll discuss maintenance plus considerations during planning that will affect the structure over its lifetime.

10:00 Break

## CONCURRENT SESSIONS

### Session A: Plants and Wildlife
Room 135 A/C

Moderators: *David Ford, Shelly Pederson*

10:30 a.m. **Soil Bioengineering**
*Karen Nagengast,* Landscape Architect, U.S. Army Corps of Engineers, St. Paul
District

This session will explore the basic principles of soil bioengineering, advantages and limitations, significance of vegetation and the importance of the root system, plus various techniques and construction methods that can be used upland or along water courses. Some demonstration project sites (case studies) will be shown in slide format and discussed as to what did or did not work and why.

11:00 **Control of Aquatic Species**
*Luke Skinner,* Coordinator, Purple Loosestrife Program, Ecological Services, Minnesota DNR

The battle against harmful aquatic exotic species is under way. Eurasian milfoil, purple loosestrife, and zebra mussels have become established in Minnesota's lakes, rivers, streams, and wetlands. This presentation will discuss efforts to slow the spread of these exotics through legislation, public awareness, and control methods, such as chemical, mechanical, and biological control. Emphasis will be placed on how local government and developers can deal with exotics when they are encountered.

### Session B: Lake Protection
Room 135 B/D

Moderators: *Warren White, Nels Nelson*

10:30 a.m. **Patterns of Municipal Storm Drainage System Development**
*Richard Brasch,* Water Resources Coordinator, City of Eagan
*Steve Kloiber,* Environmental Engineer, Montgomery Watson, Inc., Minneapolis

Fish Lake is a 30-acre lake with a maximum depth of 33 feet and a mean depth of 11 feet. As urbanization has occurred in the City of Eagan, the storm sewer system that discharges to Fish Lake has expanded to serve the drainage needs of the city. In spite of an aggressive stormwater management strategy, hypereutrophic conditions have developed. This finding has important implications regarding the effectiveness of Best Management Practices (BMPs) in achieving desirable water quality standards.

11:00 **Hypolimnetic Withdrawal and Treatment System Operation in Crystal Lake: A Case Study**
*Peter R. Willenbring,* P.E., Manager, Water Resources Department, OSM & Associates, Minneapolis

Water quality within Crystal Lake is generally suitable for fishing, swimming, and boating activities, but some of these uses are affected by algal blooms and decreased transparency during late summer months. This presentation reviews the design employed for the Crystal Lake hypolimnetic withdrawal and chemical treatment system and presents the results of the system's performance in its first year of operation.

## CONCURRENT SESSIONS

### Session A: Plants and Wildlife

11:30 **Beaver Control--Clemson Leveler**
*Mike Doncarlos*, Wildlife Section, Minnesota DNR

The Clemson beaver pond leveler was designed and developed at Clemson University to provide water level control in beaver ponds and to prevent flooding. The Minnesota DNR is currently field testing the leveler; approximately 100 units will be installed and operating throughout the state this year. To date the levelers have been very effective in controlling beaver flooding damage, especially in road culverts.

12:15 p.m Lunch
Presiding: *Sonia Jacobsen*

Water Award to *Curtis Larson*

Luncheon Session
**Columbia Heights 45 Million Gallon Treated Water Reservoir**
*Yasser AbouAish*, City of Minneapolis

### Session B: Lake Protection

11:30 **Wetland Projects for Nonpoint Source Pollution Control**
*John B. Erdmann*, P.E., Principal Environmental Engineer, Wenck Associates, Inc., Maple Plain

With a budget of $4.4 million, the Clearwater River Chain of Lakes Restoration Project is among the largest in the nation to be conducted under the Clean Lakes Program. The centerpiece of this restoration is the large-scale use of wetlands for nonpoint source pollution treatment. This presentation will describe three wetland treatment projects and a wetland isolation project and will provide monitoring data on their success.

## CONCURRENT SESSIONS

### Session A: Sediment
Room 135 A/C

Moderators: *Steve Woods, Pat Foley*

1:30 p.m. **Lake Florence Basin: Evaluating Alternatives for Lake or River Restoration**
*Keith R. Yapp*, and *Steve R. McComas*, Bonestroo, Rosene, Anderlik and Associates, St. Paul

The restoration of Lake Florence on the Root River has been extensively studied over the last 15 years. When the dam breached in the spring of 1993, river restoration became an alternative. The presentation will focus on the evaluation of river vs. lake restoration and the selection process utilized.

2:00 **Sediment Budget in the Whitewater River Watershed**
*Robert A. Bird*, P.E., Planning Engineer, USDA, Soil Conservation Service, St. Paul

Dr. Stafford Happ established sediment range cross sections throughout the Whitewater River Watershed in 1939 and 1964. Recent surveys of approximately half of these cross sections were accomplished to develop a sediment budget for the watershed and its tributaries. Discussion will be on the results of these surveys that were used with the AGNPS computer model and streambank erosion surveys to develop the sediment budget.

### Session B: City Issues
Room 135 B/C

Moderators: *Rocky Keehn, Shelly Pederson*

1:30 p.m. **Impacts of Current Wetland Regulations on Developable Land within the Metropolitan Urban Service Area (MUSA) of Lino Lakes**
*Michael Krech, Engineer/Technician*, City of Lino Lakes

The city of Lino Lakes used existing contour maps, section maps, and the National Wetland Inventory Maps to estimate the actual land available for development within the existing MUSA boundary. The city's estimate was much less than that given by the Metropolitan Council. This presentation will discuss the techniques used for estimating the developable land and how this information will be used to modify the current MUSA boundaries.

2:00 **Local Surface Water Quality Management: A Practical Approach to Water Quality Enhancement in Urban Communities**
*Cecilio Olivier*, Water Resources Engineer and Project Manager, Bonestroo, Rosene, Anderlik, and Associates; *Diane Desetele*, Water Resources Coordinator, and *Dave Hempel*, Senior Planner, City of Chanhassen

The City of Chanhassen has been the first community in Minnesota to integrate in a single plan all major elements of surface water management--water quality, wetlands, streams, and lakes. This presentation will address the main technical aspects of this comprehensive surface water management approach and its implementation by the City of Chanhassen during the past two years.

## CONCURRENT SESSIONS

### Session A: Sediment

2:30 **Erosion Modeling at Industrial Sites: Evaluating Contaminant Transport and Site Remediation**
*Melissa McShea Valentin, President,* MVA Consulting, Inc., Bloomington, Indiana, and *Kenneth F. Najjar,* Principal, ENVIRON Corporation, Princeton, New Jersey

Models were used to study the potential erosion of PCB-bearing soil at several industrial sites. Applications included evaluating NPDES stormwater compliance,establishing cleanup goals, identifying contaminant migration pathways (historical or future), and evaluating the effectiveness of erosion control measures. Typical modeling limitations will be discussed, and approaches to overcome these limitations will be proposed, along with a summary of available models.

3:15 Adjourn

### Session B: City Issues

2:30 **Setting Up a Storm Drainage Utility**
*Charles Honchell,* Director of Public Works, City of Bloomington

This session will discuss what a storm drainage utility is, who can use one and why, information needed to set one up, two examples of different approaches, and results to date.

3:15 Adjourn