

# Research & Extension Regional Water Quality Conference 2002

## **PROGRAM AND PROCEEDINGS**

**February 20-21, 2002  
Red Lion Inn at the Quay  
Vancouver, Washington**

### **Organizers**

**Washington State University**  
State of Washington Water Research Center  
Washington State University Cooperative Extension

**Oregon State University**  
Oregon Center for Water and Environmental Sustainability  
Oregon State University Extension Service

**University of Idaho**  
Idaho Water Resources Research Institute  
University of Idaho Cooperative Extension

**University of Alaska**  
Alaska Water and Environmental Research Center  
Alaska Cooperative Extension

**Environmental Protection Agency Region 10**

### **Sponsor**

**U.S. Department of Agriculture, Cooperative State Research, Education, and Extension Service**

# Research and Extension

## Regional Water Quality Conference 2002 Program

**Tuesday - February 20, 2002**

### **Session 1: Total Maximum Daily Loads - Jan Seago, Session Chair**

- 9:10 - 9:30 am [Smarter Monitoring Needed To Focus Rather Than Expand TMDL Problem](#)  
*Presenter:* George G. Ice, National Council for Air and Stream Improvement
- 9:30 - 9:50 am [Columbia and Snake River Mainstem Total Maximum Daily Load: A Broad Landscape Water Quality Improvement Tool](#)  
*Presenter:* Mary Lou Soscia, US Environmental Protection Agency
- 9:50 - 10:10 am [Development of a Decision Support Tool for Watershed Management and TMDL Process](#)  
*Presenter:* Shulin Chen, Washington State University  
*Co-Author:* Guangde Wang, Washington State University

### **Session 2: Municipal Wastewater and Stormwater - Marilyn Freeman, Session Chair**

- 9:10 - 9:30 am [Spokane Area Storm Water Quality and BMP Study](#)  
*Presenter:* David Moss, TetraTech/KCM, Inc.  
*Co-Authors:* Gary Nelson and Stanley A. Miller, Spokane County Public Works Department; Harry Gibbons, TetraTech/ISG
- 9:30 - 9:50 am [Low Impact Development: Implementing New Stormwater Management Strategies To Protect Water Quality and Aquatic Habitat in Western Washington](#)  
*Presenter:* Curtis Hinman, WSU Pierce County (Washington) Cooperative Extension  
*Co-Authors:* Len Zickler, AHBL Landscape Architects and Engineers; Katherine Brooks, Pierce County Advanced Planning; Hans Hunger, Pierce County Water Programs
- 9:50 - 10:10 am [Use of Surface and Subsurface Wetlands for Treatment of Municipal Wastewater](#)  
*Presenter:* Leland Roy Mink, University of Idaho  
*Co-Authors:* Cameron Heusser, Coeur d'Alene Tribe; Ernest Brannon, University of Idaho

### **Session 3: Water Quality Monitoring - Fred Sorensen, Session Chair**

- 10:30 - 10:50 am [Alaska Native Village Drinking Water Protection Outreach Project](#)  
*Presenter:* Malcolm Ford, University of Alaska Cooperative Extension Service
- 10:50 - 11:10 am [Arthropod Surveys of Riparian Habitats in the Lower Yakima Valley, Washington State, USA](#)  
*Presenter:* Douglas B. Walsh, Washington State University  
*Co-Author:* Martin Williams II, Washington State University
- 11:10 - 11:30 am [DNA Fingerprinting of Bacteria Sources in the Lower Boise River](#)  
*Presenter:* Sherrill Nelligan Doran, CH2M HILL  
*Co-Authors:* Tom Dupuis, CH2M HILL; Bryan Horsburgh, Idaho Department of Environmental Quality; Erica Anderson McGuire and Monica Lowe, Ada County Highway District; Mansour Samadpour, University of Washington

11:30 - 11:50 am [Who's Responsible: Fecal Source Tracking with Bacteroides](#)  
*Presenter:* Katharine G. Field, Oregon State University  
*Co-Authors:* A. E. Bernhard, University of Washington; T. J. Brodeur, L. K. Dick, M. Simonich, T. E. Jones, Jr., and C. Bracken, Oregon State University

**Session 4: Water Quality and Nutrients - Michael E. Barber, Session Chair**

10:30 - 10:50 am [The Effect of Perennial Ryegrass on Nitrate Concentration in Soil and Leachate](#)  
*Presenter:* Bingcheng Zhao, Washington State University  
*Co-Author:* Shulin Chen, Washington State University

10:50 - 11:10 am [Modeling Nitrogen Dynamics in Treatment Wetlands: The Use of Plant Efficiency Concepts](#)  
*Presenter:* Dana M. Hicks, Oregon State University  
*Co-Author:* James A. Moore, Oregon State University

11:10 - 11:30 am [Plant Exudates in Treatment of Environmental Contaminants](#)  
*Presenter:* Victor F. Medina, Washington State University  
*Co-Author:* Steven L. Larson, U.S. Army Corps of Engineers

11:30 - 11:50 am [Phosphorus Release Kinetics as Affected by Aqueous Solutions](#)  
*Presenter:* Ben L. Turner, USDA Agricultural Research Service  
*Co-authors:* D. T. Westermann, D. L. Bjorneberg and J. K. Aase, USDA Agricultural Research Service

1:00 - 2:30 pm **Poster Session** (See list of poster presentations following the conference program)

**Session 5: Temperature and Nutrients - Leland "Roy" Mink, Session Chair**

2:30 - 2:50 pm [Regional Scale Simulation of Water Temperature Variations in the Columbia River Basin](#)  
*Presenter:* Marshall C. Richmond, Pacific Northwest National Laboratory  
*Co-Author:* W. A. Perkins, Pacific Northwest National Laboratory

2:50 - 3:10 pm [Total Dissolved Gas, Temperature, and Dissolved Oxygen: Spatial and Temporal Variations Downstream of Bonneville Dam](#)  
*Presenter:* Joe H. Carroll, U.S. Army Corps of Engineers  
*Co-Author:* Jim Britton, U.S. Army Corps of Engineers

3:10 - 3:30 pm [Stream Temperature Analysis for Wenatchee Subbasin, Eastern Cascades](#)  
*Presenter:* Sara J. Feser, USDA Forest Service  
*Co-Author:* Tom Robison, USDA Forest Service

**Session 6A: Watershed Issues - Maria Panfil, Session Chair**

2:30 - 2:50 pm [Rainfall Infiltration on Juniper Dominated Watersheds in Southeast Oregon](#)  
*Presenter:* Steven L. Petersen, Oregon State University  
*Co-Author:* Tamzen K. Stringham, Oregon State University

2:50 - 3:10 pm [Quantifying the Influences of Watershed Scale Land-Use on Reed Canarygrass \(\*Phalaris arundinacea\* L.\) Abundance in the West Eugene Wetlands, Eugene, Oregon](#)  
*Presenter:* Satomi Inahara, Oregon State University  
*Co-Author:* John P. Bolte, Oregon State University

3:10 - 3:30 pm [RESTORE: A GIS-Based Multiobjective Decision Support Tool for Watershed Restoration in the Willamette Basin](#)  
*Presenter:* John P. Bolte, Oregon State University

#### **Session 6B: Watershed Issues - Bob Simmons, Session Chair**

3:50 - 4:10 pm [A Comprehensive Watershed Restoration Approach](#)  
*Presenter:* Zahid Khan, King County Department of Natural Resources  
*Co-Author:* Jon Hansen, King County Department of Natural Resources

4:10 - 4:30 pm [The Interception Dynamics of a Seasonal Temperate Rainforest](#)  
*Presenter:* Timothy E. Link, University of Idaho  
*Co-Authors:* Danny Marks, USDA Agricultural Research Service; Mike Unsworth, Oregon State University

4:30 - 4:50 pm [Integrated Impact of Climate Warming on Yakima Valley Water Demand and Availability](#)  
*Presenter:* Michael J. Scott, Battelle Pacific Northwest Division  
*Co-Authors:* Lance W. Vail, Battelle Pacific Northwest Division; Claudio O. Stöckle and Armen Kemanian, Washington State University

#### **Session 7: Salmon Issues - Jan Seago, Session Chair**

3:50 - 4:10 pm [An Environmentally Friendly Barb Design for Washington State](#)  
*Presenter:* James F. Fox, Washington State University  
*Co-Authors:* Lisa Kjos and A. N. Papanicolaou, Washington State University

4:10 - 4:30 pm [The Endangered Species Act and Chlorinated Water Discharges](#)  
*Presenter:* Greg Peterka, Public Utility District of Skagit County, Washington

4:30 - 4:50 pm [Assessment of Irrigation Return Flows for Salmon Spawning Habitat](#)  
*Presenter:* William C. Kinsel, Washington State University  
*Co-Authors:* Victor F. Medina and Saradha Vedula, Washington State University; Allan Evans, Kennewick Irrigation District

## Wednesday - February 21, 2002

### **Session 8: Animal Nutrients - Shulin Chen, Session Chair**

- 8:00 - 8:20 am [Integrated Nutrient Management Modeling for Dairy Production Systems Featuring Dynamics and Optimization](#)  
*Presenter:* Shulin Chen, Washington State University  
*Co-Authors:* Claudio O. Stöckle, Roger Nelson, Bingcheng Zhao, and Joe Harrison, Washington State University; David Walker and Garth Taylor, University of Idaho
- 8:20 - 8:40 am [Assessment of Nutrient Management Practices and Whole Farm Economics on Washington State Dairy Farms using a Computer Simulation Model \(DAFOSYM\)](#)  
*Presenter:* Joe Harrison, Washington State University  
*Co-Authors:* Lynn Johnson, Debra Davidson, Lloyd Morgan, and Shulin Chen, Washington State University; Floyd Hoisington, Dari-Tech Services
- 8:40 - 9:00 am [Precision Manure Management of Grass Silage in a Dairy Operation](#)  
*Presenter:* Lynn Johnson, Washington State University  
*Co-Authors:* Joe Harrison, Debra Davidson, Lloyd Morgan, and Shulin Chen, Washington State University; Mike Bueler, Bueler Dairy Farm; Floyd Hoisington, Dari-Tech Services
- 9:00 - 9:20 am [Treatment of Dairy Wastes Using the InStream Reactor--A Novel Rotational Reactor](#)  
*Presenter:* Jeffery J. Lyon, Soil Search  
*Co-authors:* Victor Medina, Washington State University; Larry Dickenson, Soil Search
- 9:20 - 9:40 am [Animal Waste Management, A New Era](#)  
*Presenter:* J. Ronald Miner, Oregon State University
- 9:40 - 10:00 am [Polyacrylamide Removes Coliform Bacteria from Wastewater](#)  
*Presenter:* James A. Entry, USDA Agricultural Research Service  
*Co-Author:* R. E. Sojka, USDA Agricultural Research Service

### **Session 9: River Systems - Fred Sorensen, Session Chair**

- 8:00 - 8:20 am [Response Functions for the Conjunctive Management of Water in the Eastern Snake River Plain, Idaho](#)  
*Presenter:* Donna M. Cosgrove, University of Idaho  
*Co-Author:* Gary S. Johnson, University of Idaho
- 8:20 - 8:40 am [Numerical Model Analysis of Total Dissolved Gas Abatement Alternatives for the Lower Columbia and Snake River System](#)  
*Presenter:* Marshall C. Richmond, Pacific Northwest National Laboratory  
*Co-Author:* W. A. Perkins, Pacific Northwest National Laboratory
- 8:40 - 9:00 am [Total Dissolved Gas Exchange at Ice Harbor Dam: A Historical Perspective](#)  
*Presenter:* Michael L. Schneider, US Army Corps of Engineers  
*Co-Author:* Martin Ahmann, US Army Corps of Engineers
- 9:00 - 9:20 am [The Bull Run River-Reservoir System Model](#)  
*Presenter:* Robert L. Annear, Jr., Portland State University  
*Co-Author:* Scott Wells, Portland State University

- 9:20 - 9:40 am [New Restoration Approach for Steep-Gradient Streams: Spokane River Case Study](#)  
*Presenter:* Thanos Papanicolaou, Washington State University  
*Co-Author:* Lucy Peterschmidt, Washington State University
- 9:40 - 10:00 am [A Conceptual Model of the Interaction Between the Spokane Valley--Rathdrum Prairie Aquifer and the Spokane River in the East Spokane River Valley, Washington and Idaho](#)  
*Presenter:* Stanley A. Miller, Spokane County Utilities Division  
*Co-Authors:* Reanette Boese and Erin Cunningham, Spokane County Utilities; Bea Lackaff, Spokane County Information Systems

### **Session 10: Pesticides - Bob Simmons, Session Chair**

- 10:30 - 10:50 am [Application of New Generation Systemic Insecticides through Drip Irrigation Systems: Case Study with Imidacloprid \(Admire, Provado\)](#)  
*Presenter:* Allen Felsot, Washington State University  
*Co-Author:* Judy Ruppert, Washington State University
- 10:50 - 11:10 am [How Damaging are Pesticide Mixtures in Washington State Surface Water to Aquatic Organisms?](#)  
*Presenter:* John D. Stark, Washington State University
- 11:10 - 11:30 am [Assessment of Arsenic Levels in Surface Water of the Upper Yakima River Valley, Kittitas County, Washington](#)  
*Presenter:* Brooke Asbury, Central Washington University  
*Co-Author:* Carey Gazis, Central Washington University
- 11:30 - 11:50 am [Biotransformation of Toxic Organic and Inorganic Contaminants by Halophilic Bacteria from Soap Lake, Washington](#)  
*Presenter:* Brent M. Peyton, Washington State University  
*Co-Authors:* Victor Alva and Celso Oie, Washington State University; Melanie Mormile, University of Missouri, Rolla

### **Session 11: Water Quality and Sediments - Marilyn Freeman, Session Chair**

- 10:30 - 10:50 am [Soil Loss Prediction Under Different Tillage Systems, Based on the Estimation of Rill Density, Flow Velocity Distributions and Transport Capacity](#)  
*Presenter:* Gabriel A. Mancilla, Washington State University  
*Co-Authors:* Shulin Chen, Washington State University; Donald K. McCool, WSU USDA Agricultural Research Service
- 10:50 - 11:10 am [Predicting Erosion and Sediment Yield Using Geographic Information Systems \(GIS\): Application to the Lawyers Creek Watershed](#)  
*Presenter:* Corina Fernandez, Washington State University  
*Co-Authors:* Claudio O. Stöckle, Joan Q. Wu, and Donald K. McCool, WSU USDA Agricultural Research Service
- 11:10 - 11:30 am [A "Smart" Instrument for Tracking Sediment Motion in Rivers](#)  
*Presenter:* Doug Knapp, Washington State University  
*Co-Author:* A. N. Papanicolaou, Washington State University

11:30 - 11:50 am [Sediment Storage in Small, Steep Streams in Eastern Washington Forests](#)  
*Presenter:* charles chesney, Washington Department of Natural Resources

**Session 12: Water Quality and Nutrients - Ron Miner, Session Chair**

1:10 - 1:30 pm [Dissolved Organic Carbon Losses from Furrow-Irrigated Calcareous Soils](#)  
*Presenter:* Rick Lentz, USDA Agricultural Research Service  
*Co-Authors:* Dennis C. Kincaid, USDA Agricultural Research Service; Anita C. Koehn, Washington State University

1:30 - 1:50 pm [Phosphorus Reactions in Southern Idaho Soils](#)  
*Presenter:* Jeremy Hansen, University of Idaho  
*Co-Author:* Daniel G. Strawn, University of Idaho

1:50 - 2:10 pm [Field Studies of the Soil Food Web and Nitrogen Mineralization with Implications for Nutrient Management and Water Quality](#)  
*Presenter:* Mir Seyedbagheri, Elmore County (Idaho) Extension  
*Co-Author:* James M. Torell, Elmore County (Idaho) Extension

2:30 - 4:00 pm **General Session, Panel Discussion: Collaboration Models and Funding Opportunities for Regional Water Research and Outreach - Emmett Fiske, Moderator; Ron Miner, Shulin Chen, and Bob Simmons, Panelists**

**Poster Presentations, February 20, 2002: 1:00 to 2:30pm**

1. [Pollution Assessment and Prevention](#)  
*Presenter:* Cary Armstrong, Clark County (Washington)  
*Co-Presenter:* Mike Szwaya, Clark County (Washington)
2. [Particle Removal Testing of a Continuous Deflective Separation \(CDS\) Device](#)  
*Presenter:* Chris Berger, Portland State University  
*Co-Authors:* Scott Wells and Spencer Slominski, Portland State University
3. [The Hydrology of the Ellensburg Basin, Washington](#)  
*Presenter:* Suzanne Blakeney, Central Washington University  
*Co-Author:* Carey Gazis, Central Washington University
4. [Data Collection Constraints for the Use of Length-Heterogeneity Polymerase Chain Reaction \(LH-PCR\) as an Indicator of Stream Sanitary and Ecological Condition](#)  
*Presenter:* Caragwen Bracken, Oregon State University  
*Co-Authors:* Anna Harding and Katharine Field, Oregon State University
5. [Yakima Urban Forest: Hardscapes, Soil Quality, Hydrologic Implications](#)  
*Presenter:* charles chesney, Washington Department of Natural Resources
6. [Heavy Metals Loading of the Commencement Bay Estuary: Actual and Allowable](#)  
*Presenter:* Wendy Church, Citizens for a Healthy Bay  
*Co-Author:* Katey Grange, University of Washington
7. [Stream Geomorphic Classification, Riparian Area Delineation and Riparian Cover Mapping](#)  
*Presenter:* Caty Clifton, USDA Forest Service, Umatilla National Forest  
*Co-Authors:* Alan Ager, Judy Hallisey, Elizabeth Crowe, Miles Hemstrom, Henry Lachowski, Don Evans, and Dave Vanderzanden, USDA Forest Service
8. [Monitoring and Modeling within a GIS to Determine Erosion- and Sedimentation-Related Land Use Changes on Rangeland](#)  
*Presenter:* James P. Dobrowolski, Washington State University  
*Co-Authors:* Craig N. Goodwin and G. Allen Rasmussen, Utah State University, Logan
9. [UI Dairy Manure Management System Planner](#)  
*Presenter:* James E. Harri, University of Idaho  
*Co-Authors:* R. G. Taylor and David J. Walker, University of Idaho
10. [Profile Studies Using Cross-Vanes in Perched Culvert Replacement](#)  
*Presenter:* Russell A. Lawrence, Clark Conservation District (Washington)
11. [Groundwater Protection - An Integrated Approach: 20 Years of Spokane Valley Aquifer Protection](#)  
*Presenter:* Stanley A. Miller, Spokane County Utilities  
*Co-Authors:* Reanette Boese and Erin Cunningham, Spokane County Utilities
12. [Biologically Active Covers To Reduce Ammonia Emissions](#)  
*Presenter:* J. Ronald Miner, Oregon State University  
*Co-Authors:* F. J. Humenik, Mark Rice, Diana Rashash, C. M. Williams, Wayne Robarge, Ronald Sheffield, North Carolina State University; Bruce Harris, US Environmental Protection Agency

## **Poster Presentations (continued)**

13. [Regulatory Tools For Watershed Management](#)  
*Presenters:* Karen L. Nelson and Judy Linton, US Army Corps of Engineers
14. [Erosion of Streams with Cohesive Banks: A Pilot Study](#)  
*Presenter:* A. N. Papanicolaou, Washington State University  
*Co-Author:* Robert Hilldale, U.S. Bureau of Reclamation
15. [The Channeling Phenomenon in Young Sediment Deposits: Implications to Pollution Assessment and Prevention at Naval Bases](#)  
*Presenter:* A. N. Papanicolaou, Washington State University  
*Co-Author:* A. R. Maxwell, Washington State University
16. [Using Clay Mineralogy to "Trace" Sediment Sources with Stream Suspended Sediment in the South Santiam Municipal Watershed, Oregon](#)  
*Presenter:* John M. Pearch, Washington State Department of Ecology  
*Co-Author:* J. Reed Glasmann, Willamette Geological Services
17. [Major Controls on Stream Turbidity and Landscape Stability in the South Santiam Watershed, Western Cascades, Oregon](#)  
*Presenter:* John M. Pearch, Washington State Department of Ecology
18. [Factors Affecting the Movement of Atrazine from Streams to Adjacent Aquifers](#)  
*Presenter:* Mo'ayyad Shawaqfah, Washington State University  
*Co-Author:* Michael E. Barber, Washington State University
19. [Ground and Surface Water Contributions to Chemical Mass Discharge in a Semi-Arid Dryland Agricultural Watershed](#)  
*Presenter:* Amy N. Simmons, Washington State University  
*Co-Authors:* R. M. Allen-King, C. K. Keller, J. L. Smith, Washington State University; T. P. van Biersel, Southern Connecticut State University
20. [Arbor Value Project - Assessing the Urban Forest of Yakima, Washington](#)  
*Presenter:* Angel R. Spell, Eastern Sun Ecological Services
21. [Protecting Water Quality Through Improved Horse Stall Waste Composting Recommendations: Developing A Predictive Model](#)  
*Presenter:* Garry Stephenson, Oregon State University  
*Co-Author:* Linda J. Brewer, Oregon State University
22. [Cluster Microforms: A New Tool for Stream Restoration](#)  
*Presenter:* Kyle B. Strom, Washington State University  
*Co-Author:* A. N. Papanicolaou, Washington State University
23. [Comparing the In Stream and Out Stream Water Quality of Kennewick Irrigation District](#)  
*Presenter:* Saradha Vedula, Washington State University  
*Co-Author:* Victor F. Medina, Washington State University

## **Poster Presentations (continued)**

24. [Monitoring the Environmental Health of the Clover Creek Watershed: An Indicator Study](#)

*Presenter:* Jill Whitman, Pacific Lutheran University

*Co-Authors:* Kristin Cannon, Jonathon Chesser, Aaron Henderson, Kristin Hovenkotter, Carrie Loe, Jamie Martin, Renee Rose, Kristen Russell, Nick Sontag, William Stewart, Becky Summerer, Adam Sundstrom, Kim Swanson, and Lynn Waller, Pacific Lutheran University