

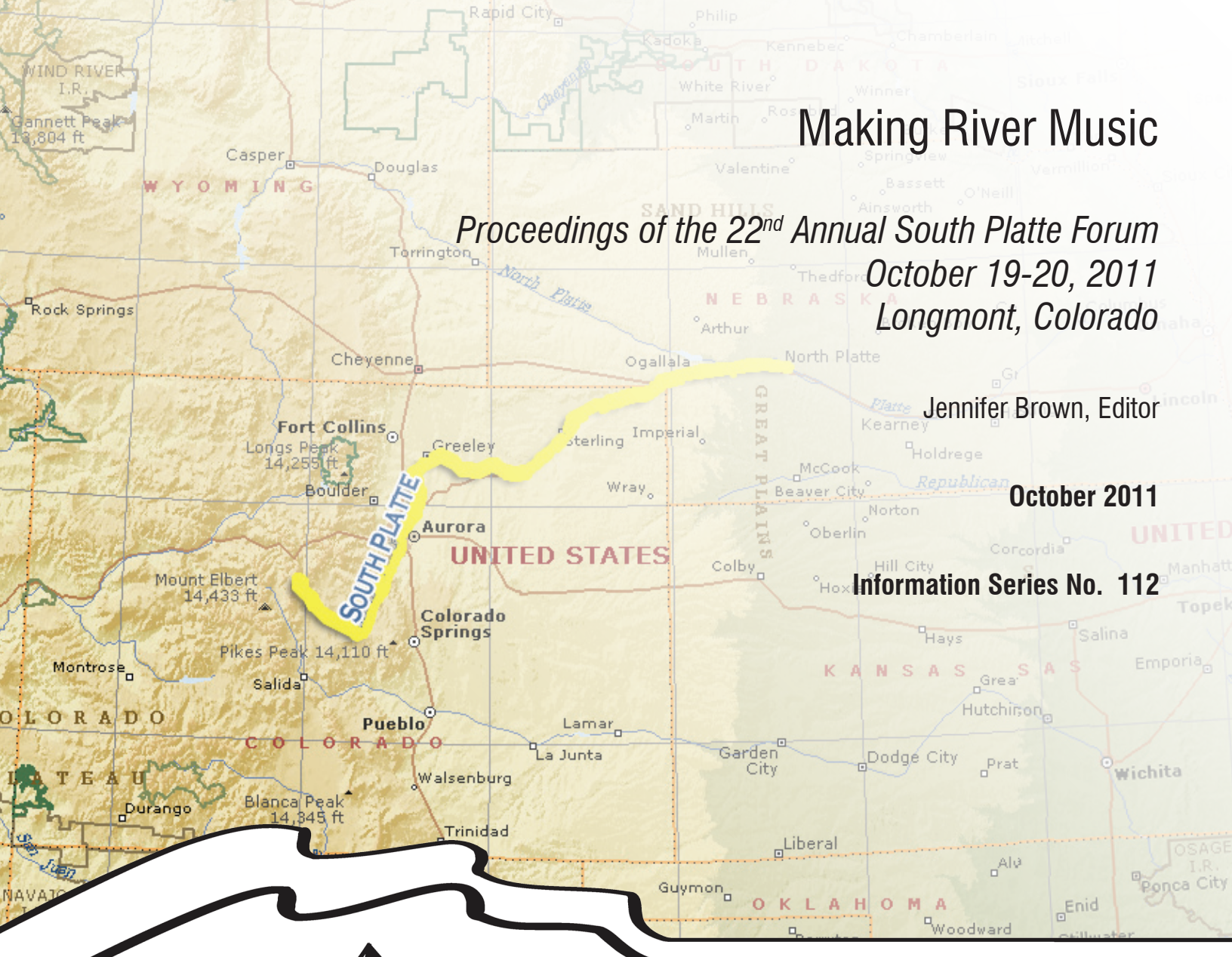
Making River Music

Proceedings of the 22nd Annual South Platte Forum
October 19-20, 2011
Longmont, Colorado

Jennifer Brown, Editor

October 2011

Information Series No. 112



Colorado Water Institute

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This report was financed in part by the U.S. Department of the Interior, Geological Survey, through the Colorado Water Institute. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the U.S. Government.

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Proceedings of the 22nd Annual South Platte Forum
October 19-20, 2011—Plaza Conference Center—Longmont, Colorado

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Colorado Water Institute, Reagan Waskom, Director
Colorado State University, Fort Collins, CO 80523-1033

Making River Music

Wednesday, Oct. 19

7:45 Registration and Continental Breakfast

8:15 Welcome - Reagan Waskom, Colorado Water Institute

8:30 Walk the Line (SWSI 2010)

John Stulp, Water Advisor to Governor John Hickenlooper

9:00 Satisfaction (Round Table Update)

Jim Yahn, Chair, South Platte Basin Round Table

9:15 In the Year 2525 (SWSI 2010 Results)

Moderator: Jim Yahn, South Platte Basin Round Table Chair

- Water Supply Development—Blaine Dwyer, AECOM
- SWSI, Identified Projects and Processes, and the M&I Gap—Eric Hecox, Colorado Water Conservation Board
- SWSI Ag Transfer Committee Report—Joe Frank, Lower South Platte Water Conservancy District
- Protecting Non-Consumptive Needs—Melinda Kassen, WaterJamin Legal and Policy Consulting

10:20 Break

10:45 On the Road Again (Water Transfers)

Moderator: Alan Berryman, Northern Water

- Planning and Managing a Farmer-Implemented ATM—Stephen Smith, Regenesys Management Group
- Lower South Platte Water Coop Update—Jim Yahn, North Sterling Irrigation District
- Platte River Recovery Implementation Program—Suzanne Sellers, Colorado Water Conservation Board

12:00 We Can Work it Out (Keynote Luncheon)

- Friends of the South Platte Award Presented to Tom Cech
- The View from around the State: Global Negotiations—Jim Lochhead, Denver Water

1:25 Money Makes the World Go Around (Economics)

Moderator: Sean Cronin, St. Vrain and Left Hand WCD

- Financing Colorado's Future—Dr. Phyllis Resnick, Center for Colorado's Economic Future
- Backseat Budgeter—Chris Adams, Engaged Public
- Legislative Perspective—Mary Hodge, Colorado State Senator
- Results of Nutrient Criteria Cost/Benefits Study—Dave Akers, Water Quality Control Division

3:00 Break

3:15 Friends in Low Places (Lower Basin Groundwater Issues and Management)

Moderator: Don Ament, Brown and Caldwell

- Groundwater Levels in the Lower Basin—Joe Frank, Lower South Platte Water Conservancy District
- Groundwater-Level Monitoring—Suzanne Paschke, U.S. Geological Survey
- High Groundwater: No Magic Bullet—Dave Nettles, Division of Water Resources

4:00 Groundwater Panel Discussion

Moderator: Don Ament, Brown and Caldwell

- Andy Moore, Colorado Water Conservation Board
- Jerry Sonnenburg, Colorado State Representative
- Joe Frank, Lower South Platte WCD
- Dave Nettles, Division of Water Resources
- Suzanne Paschke, U.S. Geological Survey

4:45 Day Ends

Making River Music

Thursday, Oct. 20

8:00 Registration and Continental Breakfast

8:30 Welcome

8:35 Running on Empty (Water Conservation)

Moderator: Rich Vidmar, City of Aurora

- Conservation's Role in Filling the Gap—Drew Beckwith, Western Resource Advocates
- Cost of New and Conserved Water—Doug Kenney, Western Water Policy Program
- Conservation and Drought Planning—Veva Deheza, Colorado Water Conservation Board
- Use What You Can Afford—Greg Fisher, Denver Water

10:10 Break

10:40 The Good, the Bad, and the Ugly (Critters Update)

Moderator: Pete Conovitz, Colorado Division of Parks and Wildlife

- Greenback Cutthroat Trout: Uncertainties and Opportunities—Harry Crockett, Colorado Division of Parks and Wildlife
- Preble's CH, DPS, and SPR: Not an 80s New Wave Band—Craig Hansen, U.S. Fish and Wildlife Service
- The Mountain Pine Beetle Epidemic—Jeff Witcosky, USDA Forest Service
- Invasive Species in Colorado—Elizabeth Brown, Colorado Division of Parks and Wildlife

12:00 Green River (Keynote Luncheon)

Bill Ritter, Center for the New Energy Economy, Colorado State University

1:20 Good Vibrations (Energy)

Moderator: Marcella Hutchinson, U.S. EPA Region 8

- Energy, Water, and Agriculture in a Drying Southwest—Stacy Tellinghuisen, Western Resource Advocates
- Shale Oil from the Niobrara—Weston Wilson, retired EPA
- Getting the Power Out: Challenges of Small Hydropower Development—Daniel Zimmerle, Colorado State University
- Micro-hydro Potential on the South Platte—Lindsay George, Applegate Group, Inc.

3:00 Forum Ends

Speaker PowerPoint Presentations are available at

www.southplatteforum.org

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Wednesday, October 19, 8:15 a.m.

Welcome

Reagan Waskom, Ph.D.

Director, Colorado Water Institute, Colorado State University, 1033 Campus Delivery, Fort Collins, CO 80523-1033, 970-491-6308, Reagan.Waskom@ColoState.EDU

Reagan Waskom currently serves as Director of both the Colorado Water Institute the Colorado State University Water Center. Reagan is a member of the Department of Soil & Crop Sciences faculty with a joint appointment to the Department of Civil and Environmental Engineering at CSU. In addition, Reagan currently serves as the Regional Director of the USDA-CSREES Integrated Water Program. Reagan received his Bachelor and Master of Science degrees from Texas A&M University and his doctorate from Colorado State University in environmental soil science.

Reagan's recent research and outreach projects include: irrigation water optimization in water limited environments, evaluation of alternatives to Ag water transfer, evaluation of Western households' perceptions and preferences for water use and acquisition, evaluation of municipal water conservation programs, development of best management practices for crop production, and survey of current irrigation management practices to evaluate constraints to adoption. Current teaching responsibility at CSU is for GRAD592, the Graduate Water Resources Seminar. In addition, Reagan supervises the CSU Extension Water Outreach program and personnel.

Wednesday, October 19, 8:30 a.m.

Walk the Line (Opening Keynote)

SWSI 2010 - 2050

John Stulp

Special Policy Advisor to the Governor on Water and Director, IBCC, Governor Hickenlooper's Office, 1313 Sherman St., Ste. 721, Denver, CO 80203, 303-866-3441 X3257, john.stulp@state.co.us

Wednesday, October 19, 9:00 a.m.

Satisfaction (South Platte Basin Round Table Update)

Jim Yahn

Chair, South Platte Basin Round Table; Manager, North Sterling Irrigation District, 112 N 8th Ave., P.O. Box 103, Sterling, CO 80751, 970-522-2025, jim@northsterling.org, www.northsterling.org

Initially launched as an idea in 2009, the Lower South Platte Water Cooperative has continued to evolve from a way for moving excess recharge credits into augmentation plans with deficits to a larger scale program. The cooperative will not only more efficiently use recharge credits among agricultural users, but also has the potential to provide water to municipal users through partnerships and use alternative Ag transfer methods such as rotational fallowing or deficit irrigation to bolster quantities and firm yields. This idea was discussed and with the help of money from a Colorado Water Conservation Board (CWCB) Alternative Transfer Method grant, was studied to determine its feasibility and buy in by ditch and reservoir companies.

The study showed that it is possible to exchange excess credits for use by Ag producers and municipal users, and it was determined that there was sufficient interest to proceed with further study. Two main areas in need of study were the organizational structure and the operational plan. Questions needing to be answered were: What type of organizational structure would be fair, open, and transparent? and, How would an organization such as this actually operate within current water law, ensuring no injury to existing water rights? To address these questions, the Lower South Platte Water Cooperative steering committee applied for and received two grants, one through Water Supply Reserve Account money (roundtable funds) and one from the second round of CWCB's Alternative Agriculture Transfer Methods Grant Program.

To oversee these two studies, a Grant Review Committee was formed. This committee consists of 10 ditch and reservoir representatives, some of whom were part of the original steering committee. With this next study phase in progress, it is hoped that agricultural producers will be able to understand what the co-op is and how it will operate and in the end, will be able to determine if their ditch or reservoir company is interested in participating. The final step, if sufficient interest still exists, would be to make an application in water court to carry out the desired operation.



Jim Yahn is the manager of the North Sterling and Prewitt Reservoirs, a position that he has held for more than 19 years. He is responsible for overseeing the diversion and distribution of water to over 350 farmers. Together the reservoirs are a source of irrigation water for approximately 70,000 acres. The North Sterling, on average, diverts 125,000 acre feet of water annually from the South Platte River, while the Prewitt, on average, diverts 40,000 acre feet.

Jim is a registered professional engineer, receiving a Bachelor of Science in Agricultural Engineering from Colorado State University. Prior to his employment with the North Sterling and Prewitt, he worked as a private consulting engineer in Fort Collins for five years. He is a native of Colorado and grew up on a family ranch, which used water from the North Sterling Reservoir System.

Jim served as a member of the Senate Bill 73 Committee in 2003, and he was a member of the Governor's South Platte Basin Task Force in 2007. Currently, Jim serves as the Chairman of the South Platte Roundtable. In his spare time, Jim farms and ranches with his wife Tracy and two children, preaches part time for Cowboy Up Ministries, and enjoys singing with a contemporary Christian band.

Wednesday, October 19, 9:15 a.m.

In the year 2525 (SWSI 2010 Results Panel)

Moderator: Jim Yahn

Chair, South Platte Basin Round Table; Manager, North Sterling Irrigation District, 112 N 8th Ave., P.O. Box 103, Sterling, CO 80751, 970-522-2025, jim@northsterling.org, www.northsterling.org

Colorado Water Supply Development: With No Low-Hanging Fruit In Sight, What's Next?

Blaine N. Dwyer, PE, D.WRE

Vice President, AECOM Water, 717 17th St., Ste. 2600, Denver, CO 80202, 303-542-4719, blaine.dwyer@aecom.com

After years of useful data compilation and “needs” analysis, Colorado is at a crossroads. Weary of meetings and process, some are impatient to see shovels turn. Others passionately strive not just for environmental mitigation of supply projects, but also for supply programs that enhance current flow regimes for the non-consumptive water needs of our headwater state. What should come next in supply development? What types of projects could make sense? What separates projects that get implemented from those that languish? The characteristics of successful projects, from planning through permitting, design and implementation, will be presented considering the context of Colorado's ongoing programs.

Blaine N. Dwyer, P.E., D.WRE is a vice president of AECOM. Blaine has been engaged in Colorado water planning for more than 30 years as a consultant and as a project manager for a state water agency. He holds engineering degrees from CSU and from CU, was born in the Colorado River Basin, and resides in the South Platte Basin. With experience on many of the state's high profile projects, including Moffat, Windy Gap, Milton Seaman, Colorado River Water Availability Study, Platte River program, the “Big Straw” and many others, Blaine has a good understanding of the fundamental challenges of water supply development. A father of two, he and wife Patty must now get a good understanding of the fundamental challenges of the empty-nest syndrome. Advice is welcome in both areas.



SWSI, Identified Projects and Processes, and the M&I Gap

Eric Hecox

Colorado Water Conservation Board, Section Chief, Water Supply Planning, 1580 Logan, Room 200, Denver, CO 80203, 303-866-3441 x3217, eric.hecox@state.co.us, www.cwcb.state.co.us

This presentation will focus on the results of the 2010 Statewide Water Supply Initiative (SWSI 2010). SWSI 2010 calculated Colorado's water supply needs for municipal and industrial (M&I), agricultural, and environmental and recreational uses. This presentation will focus on Colorado's 2050 M&I water needs. It will describe the "identified projects and processes" currently being pursued by water providers throughout the state to meet a portion of these needs and the remaining M&I water supply gap.

Eric is Section Chief for CWCB's Water Supply Planning Section. The section manages the Interbasin Compact Process and associated basin Roundtables, and analyzes Colorado's current and future consumptive and non-consumptive water needs and potential projects or methods to meet those needs. It is responsible for the implementation of CWCB's Statewide Water Supply Initiative (SWSI), and it administers the Water Supply Reserve Account and the Alternative Agricultural Transfers grant program and provides public education and outreach on Colorado's water supply future.

Eric has served as the Acting Deputy Director for CWCB and prior to joining the State, Eric served as a Natural Resource Specialist to the Bureau of Land Management's National Science and Technology Center under a Presidential Management Fellowship.

Eric received his Bachelor of Arts in biology from Lawrence University and prior to graduate school was a Fulbright Scholar at the University of Zimbabwe. He earned a Master of Science in Environmental Science in Water Resources and a Masters of Public Affairs from Indiana University's School of Public and Environmental Affairs.

SWSI Ag Transfer Committee Report

Joe Frank, P.E.

General Manager, Lower South Platte Water Conservancy District, 100 Broadway Plaza, Ste. 12, Sterling, CO 80751, 970-522-1378, jmfrank@lspwcd.org

According to the Statewide Water Supply Initiative's 2010 Key Findings, "Alternatives to permanent agricultural water transfers appear to be viable means for meeting a portion of the M&I water supply gap. However, there are significant hurdles to implementing these programs." Alternatives to permanent agricultural water transfers include rotational fallowing, interruptible supply agreements, water banks, purchase and lease-backs, deficit irrigation and changing crop types.

Numerous projects across the state are looking to address the hurdles to alternative transfers and to formalize innovative measures to successfully develop "on the ground" alternative transfer programs. Most of these projects are funded in large part through the Colorado Water Conservation Board's Alternative Agricultural Water Transfer Methods Grant Program, created by the Legislature passed Senate Bill 07-122, which authorized the CWCB to develop a grant program to facilitate the development and implementation of alternative agricultural water transfer methods (ATMs). The findings, conclusions and recommendations from these projects document great potential for ATMs in addition to the continuing need to address the possible hurdles of ATMs. It is also important to note that ATMs are one of the several supply and demand solutions to addressing the 2050 M&I water supply gap. ATMs are continuing to be analyzed in conjunction with other supply and demand solutions by the state of Colorado, the Interbasin Compact Committee, and the nine basin Roundtables.

Joe Frank is the general manager for the Lower South Platte Water Conservancy District. He has been with the District for nearly eight years and has served as manager since May, 2004. The district serves more than 400,000 acres in Morgan, Washington, Logan, and Sedgwick Counties in Northeastern Colorado. He also represents the district on the South Platte Basin Roundtable, is president of Colorado Water Congress, and sits on various committees for the Platte River Recovery Implementation Program and the South Platte Water Related Activities Program. Through the district, Joe also assists with coordination efforts of the Lower South Platte Water Cooperative, manages the District 64 Reservoir Company, provides augmentation accounting services, and provides technical assistance and coordination in developing and operating various augmentation plans and water supply projects. He graduated with a bachelor's degree in civil engineering from the Colorado School of Mines in 1998 and is a licensed Professional Engineer in the state of Colorado.



Protecting Non-Consumptive Needs

Melinda Kassen

Principal, WaterJamin Legal and Policy Consulting, 2350 Balsam Dr, Ste. 103, Boulder, CO 80304, 303-579-5453, melindakassen@aim.com, www.waterjamin.com

Integrating non-consumptive needs into basin roundtable needs assessments and the IBCC's Future Supply Framework has been a challenge. One cannot address the amounts of water necessary to maintain healthy river flows as a generalization. Rather, the amounts of water necessary to sustain a healthy environment or recreation economy are both site- and season-specific. Ms. Kassen will review the roundtables' and IBCC's progress to date, make the case for why the roundtables and IBCC need to finish this task, and offer some suggestions as to how to do so.

Melinda Kassen has focused her career in environmental and water law; she has published articles, produced reports and is a regular speaker at classes and conferences. She currently consults on legal and policy matters for non-profit organizations, landowners, and private foundations, mostly regarding western water issues, especially in Colorado and the Colorado River Basin. For more than a decade, she started, grew, and directed first the Colorado Water Project and ultimately the six-state Western Water Project for Trout Unlimited, where staff worked to protect and improve stream flows.

Previously, Melinda worked as a government contractor for ICF Kaiser and Kaiser-Hill LLC negotiating an agreement for the clean-up of contamination from nuclear weapons production at the Rocky Flats site in Golden, Colo., and then lobbying for its funding. She served as environmental counsel to the House Armed Services Committee in the 103rd Congress. She was a visiting professor for a year at the University of Denver Law School teaching environmental and administrative law courses. For seven years at the Environmental Defense Fund, she split her time between the water program, where she was on the team that urged EPA to veto the Two Forks Dam permit, and the toxics program, where she worked on federal facility clean up issues and nuclear waste policy. She learned water quality and water rights at the Colorado Attorney General's Office representing the State Engineer, Water Conservation Board and Water Quality Control Commission and Division.

Melinda started her legal career prosecuting domestic violence cases for the Los Angeles City Attorney. She received her Juris Doctorate at Stanford Law School and graduated magna cum laude from Dartmouth College. She lives in Boulder, Colorado with her husband and son.

**Speaker PowerPoint Presentations are available at
www.southplatteforum.org**



Wednesday, October 19, 10:45 a.m.

On the Road Again (Water Transfers)

Moderator: Alan D. Berryman

Assistant General Manager, Northern Water, 220 Water Ave., Berthoud, CO 80513, 970-622-2335, aberryman@ncwcd.org, www.northernwater.org

Planning and Managing a Farmer-Implemented ATM Involving a Partial Transfer of Consumptive Use Water

Stephen Smith

Partner, Regenes Management Group, 8204 S. CR 3, Fort Collins, CO 80528, 970-222-9680, swsmith@regenmg.com, <https://www.regenmg.com/Home.aspx>

Farming, in many ways, is more complex and technically demanding than ever before. Just one example of this complexity is related to the population growth in many areas of the western United States. Municipalities, desperate to identify their future water supplies that will sustain continued growth and produce a “safe yield,” are frequently looking toward agriculture as a water source. Often enough, farms are acquired and the water rights are parted off 100% to be changed over to municipal use. This is often called “buy and dry.”

The premise of this presentation is to show that successful farming operations can be continued while benefiting from a proportional parting-off of the water right’s established consumptive use (CU). The CU of a given water right is established through an engineering study and report, which evaluates and details the historic use of the water right. Historic cropping patterns, acreages, and irrigation methodologies are considered. Once the CU, expressed as acre feet per water stock share, is established and vetted through the state regulators, the CU is decreed and allows for comprehensive study as to how CU might be used to advantage in the future. One example of a future water use is for the farmer to lease or sell a portion of the quantified CU to a municipal or environmental interest. Another example is controlling overall water use of large-scale operations (i.e., corporate water users or ditch companies) and related input costs (i.e., fertilizer, harvesting cost, etc).

Once actual water CU quantification is fully understood, consideration can be given to a comprehensive package of practices which become the underpinning of future agriculture operations for farmers interested in such a change. Practices may include changes to cropping patterns, consideration of alternative crops, deficit irrigation, improved irrigation application efficiencies, and improved management and monitoring/control using the newest technologies.

Stephen W. Smith, Ph.D., is a founding partner of Regenes Management Group, a high technology irrigation management firm. He also founded Aqua Engineering, Inc. in 1975. His irrigation engineering experience includes projects throughout the United States, Europe, the Far East, and the Middle East. He served on the faculty at Colorado State University, where he taught irrigation design for 20 years. In 1996, he authored Landscape Irrigation: Design and Management, a definitive textbook on landscape irrigation. Stephen is past president and a fellow of the American Society of Irrigation Consultants. In 2009, he was president of the Irrigation Association and currently serves on the IA Board of Directors. He also currently serves on the Board of the Loudon Irrigating Canal & Reservoir Co. and farms under this ditch system in northeastern Colorado.

Lower South Platte Water Co-op Update

Jim Yahn

Chair, South Platte Basin Round Table; Manager, North Sterling Irrigation District, 112 N 8th Ave., P.O. Box 103, Sterling, CO 80751, 970-522-2025, jim@northsterling.org, www.northsterling.org

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Platte River Recovery Implementation Program (PRRIP) Overview and Benefits

Suzanne Sellers, P.E.

Program Manager, Colorado Water Conservation Board, 1313 Sherman St., Ste. 721, Denver, CO 80203, 303-866-3441, suzanne.sellers@state.co.us, www.cwcb.state.co.us

The Platte River Recovery Implementation Program (PRRIP or Program) is a highly successful collaborative conservation partnership working to recover four threatened and endangered species (the whooping crane, interior least tern, piping plover and pallid sturgeon) in Nebraska while at the same time allowing water use and development to continue in our growing western communities. This program involves the states of Wyoming, Nebraska, and Colorado, federal agencies, and many water, power and environmental interests. This program provides Endangered Species Act (ESA) compliance for water projects and fully complies with the participating states' water law and with interstate river compacts and decrees. The program is being implemented in an incremental manner, with the First Increment covering the 13-year period from 2007 through 2019. This presentation will provide an overview of the PRRIP and discuss the program's recent efforts toward meeting its milestones. Additionally, Ms. Sellers will provide an update on Colorado's Tamarack Project and Colorado's efforts in meeting its program obligations. Ms. Sellers will also discuss the benefits of the PRRIP to the threatened and endangered species as well as to Colorado.

Suzanne Sellers, P.E., is a Program Manager for the Colorado Water Conservation Board's (CWCB) Federal and Interstate Section where she works on the PRRIP, Recreational In-Channel Diversions (RICD), Wild and Scenic Rivers and other projects. Prior to joining the CWCB, Suzanne was a water rights engineering consultant, a team leader for the Colorado Division of Water Resources and an environmental engineering consultant. Suzanne received her bachelor's degree in civil engineering from California Polytechnic State University in San Luis Obispo.

Wednesday, October 19, 12:00 p.m.

We Can Work it Out (Keynote Luncheon)

Friends of the South Platte Award Presentation to Tom Cech

Tom Cech

Cech Press LLC, 501 Spinnaker Ln, Fort Collins, CO 80525, 970-371-9598, cech52@gmail.com, www.cechpress.com

Tom Cech was born and raised on a farm near Clarkson, Nebraska. He graduated from Kearney State College with a Bachelor of Science in Math Education and later received a master's degree in Community and Regional Planning from the University of Nebraska - Lincoln. He was executive director of the Central Colorado Water Conservancy District in Greeley from 1982 until April 2011. Tom now has begun Cech Press LLC, and provides water resources writing/editing and education services to clients such as the Colorado Water Conservation Board, Regenesys, and Colorado State University.

Tom wrote Principles of Water Resources: History, Development, Management and Policy, published by John Wiley & Sons - currently in its 3rd edition and to be released in 2013 in Portuguese. He is currently an Affiliated Faculty member in the Department of Ecosystem Science and Sustainability at Colorado State University in Fort Collins. Tom also recently published Introduction to Water Resources and Environmental Issues, (co-author Dr. Karrie Pennington) with Cambridge University Press and Colorado Water Law for Non-Lawyers, (co-author P. Andrew Jones) with the University Press of Colorado.

Tom and his wife, Grace, from St. Paul, Nebraska, live in Fort Collins, Colorado.

Friends of the South Platte

This award program was initiated in 2004 to recognize individuals and organizations who, through diligence and dedication, have made exceptional contributions in the South Platte River Basin.

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To nominate an individual or organization for the Friends of the South Platte award, visit www.southplatteforum.org. Honorees are selected by the organizing committee.

Special thanks to John Fielder for his generous donation of the picture “South Platte Sunset” and his support of the Friends of the South Platte Award. “South Platte River Sunset” can be found with John’s other fine art prints at John Fielder’s Colorado, his art gallery in the Cherry Creek mall. You can also view his work, learn about workshops and order books at www.johnfielder.com.

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**The 23rd Annual
South Platte Forum**



The View from Around the State: Global Negotiations

Jim Lochhead

Denver Water

James S. Lochhead was appointed Denver Water's CEO/Manager in June 2010. Prior to Denver Water, he was a shareholder at the Denver law firm of Brownstein Hyatt Farber Schreck, LLP. He served as Executive Director of the Colorado Department of Natural Resources from 1994 to 1998. He has served on various boards, including the State Board of Great Outdoors Colorado, Upper Colorado River Commission, Colorado Water Conservation Board, Colorado's Roadless Area Task Force, Colorado Conservation Trust, Colorado Water Trust, the Legal Aid Foundation of Colorado and The Nature Conservancy Colorado.

Wednesday, October 19, 1:30 p.m.

Money Makes the World Go Around (Economics)

Moderator: Sean Cronin

Executive Director, St. Vrain and Left Hand Water Conservancy District, 9595 Nelson Rd., Ste. 203, Longmont, CO 80501, 303-772-4060, sean.cronin@svlhwcd.org, www.svlhwcd.org

Sean is the Executive Director for the St. Vrain and Left Hand Water Conservancy District. He has over 16 years experience in water resource planning and policy. Sean earned his bachelor's degree in Environmental Science from the University of North Carolina at Charlotte, and spent two years as a Natural Resources Agent with the North Carolina Cooperative Extension Service before moving to Colorado. Prior to joining the District, Sean spent 13 years with the city of Greeley, including the last six as their Water Resources Manager. Sean is a member of the South Platte Roundtable and serves on the Board of Directors for the Colorado Section of the American Water Resources Association.

Sean lives in his adopted home of Colorado with his wife and two small children. When Sean isn't spending time with family, working, or volunteering, you can find him on a river trying to master the art of making a trout rise.

Financing Colorado's Future: An Analysis of the Fiscal Sustainability of State Government

Dr. Phyllis Resnick

Lead Economist, Center for Colorado's Economic Future, 303-554-9292, r2analysis@comcast.net

Dr. Phyllis Resnick is the managing director of R² Analysis, LLC and the lead economist at the University of Denver's Center for Colorado's Economic Future. The center's current effort is a year-long comprehensive study of fiscal position of the state and local governments in Colorado. Dr. Resnick is leading that modeling effort. Among her current private clients are the Denver Regional Council of Governments, where she serves as Regional Economist, the City and County of Denver, and the Utah Foundation. With these clients, her emphasis is on public finance, taxation, and regional economic analysis. Dr. Resnick holds a doctorate and Master of Arts from the University of Colorado in public affairs and economics, respectively, and a Bachelor of Business Administration from the University of Michigan. She serves nationally on the Board of Trustees of the Governmental Research Association.



Backseat Budgeter

Chris Adams

President, Engaged Public, 1490 Lafayette St., Ste. 306, Denver, CO 80218, (303)282-9250, Chris@EngagedPublic.com

The Colorado Budget faces enormous challenges—both during these tough economic times and over the long term. Backseat Budgeter is a free, online simulation of the budget that allows users to make choices about what services state government should offer and how to pay for them. This session will provide a demo.

Chris Adams has worked in public policy and facilitation for more than 15 years, the last 13 with Engaged Public. His work has focused primarily on health care, but he has also supported policy development in education and natural resources. Prior to founding Engaged Public, Adams was Director and Associate Director of the Center for Ethics and Social Policy in Berkeley, California. He has published more than 40 essays in publications including the Los Angeles Times, New York Newsday, the Christian Science Monitor, the San Francisco Chronicle and many others. He is a past speaker at the distinguished Conference on World Affairs at the University of Colorado, delivering five presentations on the theme “Values and Ethics in a Fragile World.” Adams is president of the board of Denver Urban Gardens, a network of more than 100 community gardens. He is a graduate of Yale University and the University of Colorado. He is married and has three children.

Legislative perspective:

Mary Hodge

Colorado State Senator, District 25 , 200 E. Colfax , Denver, CO 80203 , (303) 866-4855, mary.hodge.senate@state.co.us

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Results of Nutrient Criteria Cost/Benefits Study

Dave Akers

Deputy Director, Water Quality Control Division, Colorado Department of Public Health and Environment, 4300 Cherry Creek Dr. South, Denver, CO 80246-1530, 303-692-3591, Dave.Akers@dphe.state.co.us

The Colorado Water Resources and Power Development Authority has provided approximately \$400,000 to conduct a study that estimates the costs and benefits associated with promulgation of a nutrient control regulation in Colorado for situations where additional treatment by wastewater treatment plants for phosphorus and nitrogen may be required. The economic analysis will be part of the evidence examined by the Water Quality Control Commission when it holds a rulemaking hearing to evaluate the Water Quality Control Division's proposal for regulations to control nutrients. The intent of the cost-benefit study is to inform the Commission of the statewide implications of the proposed regulations. The study is being performed by a contractor (CDM) and overseen by the Division. Stakeholder meetings to discuss the scope of the study and its progress have been held. The study is to be finalized in the fall of 2011, which the rulemaking hearing scheduled for March 2012.

Wednesday, October 19, 3:15 p.m.

Friends in Low Places (Lower Basin Groundwater)

Moderator: Don Ament

Project Development Executive, Brown and Caldwell, 28817 Cty Rd 65, Iff, CO 80736, 970-522-8205, d.ament@hotmail.com

In our arid state, it is imperative that we maximize the use of our water (surface and groundwater). The purpose of our panel will be to take a look at current management practices and ask some questions. Do we have the best science available to manage from (South Platte Decision Support System)? Do we have the best technology in place? Is our high ground water table the result of our augmentation program or our current weather pattern? Can we find a way to lower the water table and still protect our senior surface rights (using wells in lieu of diverting surface water, strategically placed storage)? Is there an incentive to do any of this with the high cost of water rights proceedings and the status of the state budget? It is my hope, even though recent Water Court decisions have somewhat polarized the water community, that we all can take a look at some potential management options that can further maximize our water use (ATMs, South Platte CO-OP, etc.).

Don Ament served as the Colorado Commissioner of Agriculture for eight years under Governor Bill Owens' administration. Don served 12 years in the Colorado General Assembly, chairing the Agriculture, Natural Resources, and Energy Committees and the Capital Development Committee. Prior to his election to the State Legislature, Don served for five years on the State Board of Education, four of them as chairman. He also served 14 years on the RE-1 Valley School Board in Sterling and is a former president of the Colorado Association of School Boards.

Nationally, Don chaired the American Legislative Exchange Council's Task Force on Agriculture and is considered an expert in areas of water and property rights. He served as Chair of the National Association of State Departments of Agriculture (NASDA) Natural Resources and Pesticide Management Committee, President of the Western Association of State Departments of Agriculture (WASDA), and is the Governor's appointee as Colorado's representative on the Platte River Recovery Implementation Program Governance Committee with Nebraska and Wyoming.

Don is a spokesperson for agriculture and natural resources and an advocate for wise utilization of water and forest resources and property rights. He believes in promoting the importance of the agricultural industry and the role it plays in preserving our quality of life. Don supports innovative ideas to increase and improve production agriculture and the utilization of new technology and alternative energy resources.

Don has lived his entire life in Colorado, having majored in engineering and minored in instrumental music from the University of Colorado, Don continues to farm and ranch in Northeast Colorado. He and his wife, Patty, have three grown children, and six grandchildren.



What Is Happening with Groundwater Levels in the Lower Basin

Joe Frank, P.E.

General Manager, Lower South Platte Water Conservancy District, 100 Broadway Plaza, Ste. 12, Sterling, CO 80751, 970-522-1378, jmfrank@lspwcd.org

With three consecutive years of above average precipitation and runoff, rising groundwater tables, and continued well curtailment, the debate continues on as to the effectiveness of groundwater management in conjunction with surface water interactions, and to the ongoing requirements of well augmentation within the South Platte Basin. Statements such as “the aquifer is full” and “we are sending too much water to Nebraska” become more and more a part of the conversations surrounding the issue of groundwater and surface water interactions. But what is “full” and what does the past and present say about the alluvial aquifer, the return flows generated from irrigation practices and natural precipitation, and the hydrology of the basin in general?

State law and court decreed augmentation plans require the replacement of the consumptive use portion of well pumping in “time, location, and amount” whenever a downstream water right’s demand (including the Colorado-Nebraska compact) is unmet. These requirements are set up to protect other vested water rights in the basin while allowing augmented wells to pump. During the past decade, managed groundwater recharge has become the primary source of meeting these augmentation requirements, retiming an additional 150,000 to 300,000 acre feet per year into the South Platte alluvial aquifer in order to replace well pumping depletions to the river. Managed groundwater recharge does have its limitations and inefficiencies, but overall it has greatly served to meet the augmentation requirements of well owners and to satisfy the surface water users within the basin. It may just be that these current recharge and augmentation practices have actually returned the basin to a time prior to the major development of wells yet after the development of surface water irrigation, a time when groundwater tables were high and return flows to the river were increasing in nature.

Joe Frank is the general manager for the Lower South Platte Water Conservancy District. He has been with the District for nearly eight years and has served as manager since May, 2004. The district serves more than 400,000 acres in Morgan, Washington, Logan, and Sedgwick Counties in Northeastern Colorado. He also represents the district on the South Platte Basin Roundtable, is president of Colorado Water Congress, and sits on various committees for the Platte River Recovery Implementation Program and the South Platte Water Related Activities Program. Through the district, Joe also assists with coordination efforts of the Lower South Platte Water Cooperative, manages the District 64 Reservoir Company, provides augmentation accounting services, and provides technical assistance and coordination in developing and operating various augmentation plans and water supply projects. He graduated with a bachelor’s degree in civil engineering from the Colorado School of Mines in 1998 and is a licensed Professional Engineer in the state of Colorado.



Groundwater-Level Monitoring in the South Platte River Alluvial Aquifer

Suzanne Paschke

U.S. Geological Survey, Colorado Water Science Center

Unconsolidated alluvial sand and gravel deposits that primarily occur along present-day stream channels form an extensive and productive alluvial aquifer along the South Platte River of eastern Colorado. Irrigated agriculture is the primary use of groundwater from the South Platte alluvial aquifer, although alluvial groundwater also supports municipal, industrial, and domestic water supplies in the lower South Platte Basin. Groundwater levels in the South Platte alluvial aquifer have been measured by numerous government and private entities since the 1920s, most recently by the Colorado Division of Water Resources as part of the South Platte Decision Support System. This presentation will provide an overview of groundwater-level monitoring efforts in the South Platte alluvial aquifer.

Suzanne Paschke is presently Associate Director of Hydrologic Studies for the U.S. Geological Survey Colorado Water Science Center in Denver, Colorado. As a groundwater hydrologist with over 25 years of experience, Suzanne's work has focused on hydrogeologic evaluation, modeling, and water-quality assessments. Recent projects include developing regional computer simulations of groundwater flow and water quality for the Denver Basin and evaluation of groundwater quality in the South Platte River Basin as part of the USGS National Water-Quality Assessment Program. Suzanne holds a Bachelor of Science in Geology from the University of Wyoming (1983), a Master of Engineering (1992) and a doctorate (1998) in Geological Engineering from the Colorado School of Mines.

High Groundwater – No Magic Bullet

David L. Nettles, P.E.

Division Engineer, Water Division 1, Colorado Division of Water Resources, 810 9th St., Ste. 200, Greeley, CO 80631 970-352-8712, david.nettles@state.co.us, www.water.state.co.us

Groundwater levels in an alluvial aquifer system are always in a state of change controlled by the inflows and outflows to the aquifer. When inflows exceed outflows, groundwater levels rise, and when outflows exceed inflows, levels fall. Also, the relationship between inflows and outflows is not constant but varies both by location and with time. Further, inflows and outflows fall into two major categories – natural and artificial.

Natural inflows consist primarily of direct precipitation recharge and stream flow recharge during higher than normal stream stages. Artificial inflows consist of both unintentional and intentional recharge caused by humans. Unintentional recharge is primarily from ditch/canal/reservoir seepage and deep percolation of unconsumed irrigation water. Intentional recharge is primarily from ditch/canal seepage and infiltration from recharge basins under augmentation plans.

Natural outflows consist primarily of discharge to streams, either directly or via springs and seeps, evapotranspiration by non-human planted phreatophytes, and evaporation by natural groundwater ponds. Artificial outflows consist primarily of well pumping that is fully consumed, evapotranspiration by human planted phreatophytes, discharge to streams by human-made drainage systems, and evaporation by human-made groundwater ponds.

The authority of the Colorado Division of Water Resources to regulate water diversions is limited by both water right decrees and state statutes. If water can be diverted in priority and placed to a beneficial use with minimal waste, such diversion must be allowed. Allowance or disallowance of a diversion, like the relationship between groundwater inflows and outflows, is always location and time dependent.

When high groundwater problems are encountered, there is a tendency to focus on (blame) one particular inflow or outflow variable (generally intentional recharge or well curtailment). However, given the constant state of time and location specific change as well as the variability in sources of groundwater inflows and outflows, it is unlikely addressing only one variable will result in a satisfactory solution to the problem. A more likely solution, albeit a more difficult one, is a cooperative local approach to adjust human controlled activities.

Dave was born and raised in a very small town in central Louisiana. He received his Bachelor of Science in Agricultural Engineering from Louisiana Tech University in 1982 and his Master of Science in Agricultural Engineering from Colorado State University in 1984. After a short stint with the State of Montana working on federal reserved water right issues, Dave joined the Colorado Division of Water resources in 1986. After five years in the Denver office, Dave became an Assistant Division Engineer in the Division 1 Greeley office in 1991. He became the lead Assistant Division Engineer in 2003 and the Division Engineer in 2010.



Water Division 1 covers the northeastern portion of Colorado including the South Platte, Republican, and Laramie river basins. The current staff includes approximately 50 full and part time employees responsible for water rights administration, water diversion and stream flow measurements, as well as the dam safety program within Division 1.

Dave currently lives in Greeley with his wife (a native Coloradoan) and two daughters.

Panel Discussion – Moderated by Don Ament

Andy Moore, P.E.

Water Resources Engineer, Colorado Water Conservation Board, 1313 Sherman St., Room 721, Denver, CO 80203
303-866-3441 x3229, andy.moore@state.co.us, www.cwcb.state.co.us

Andy Moore has worked in water resources issues in Colorado for 25 years. He has been with the Colorado Water Conservation Board for over 15 years, working primarily with the development and application of decision support systems. Prior to the state, he was employed with Rocky Mountain Consultants in surface and groundwater modeling related to water rights transfers. He is a registered P.E. in Colorado and has a Bachelor of Science and a Master of Science in Civil Engineering from Rice University and the University of Texas, respectively.

Jerry Sonnenberg

State Representative, 4465 CR 63, Sterling, CO 80751, 970-581-8648, Jerry@RepSonnenberg.com,
www.RepSonnenberg.com

State Representative Jerry Sonnenberg is a farmer and rancher from northeastern Colorado and serves as the Chairman of the House Agriculture, Livestock and Natural Resources Committee. He has served in the State Legislature since 2007 and is an advocate for water storage and keeping Colorado's water in Colorado. Representative Sonnenberg also serves on the Interbasin Compact Committee as well as on the Board of Directors for the Colorado Foundation for Water Education and was a member of the South Platte Basin Task Force in 2007.

Thank you for coming.

We'll start again Thursday morning promptly at 8:30 a.m.

A continental breakfast will be available at 8:00 a.m.

See you then!!



Thursday, October 20, 8:30 a.m.

Running on Empty (Water Conservation)

Moderator: Rich Vidmar, City of Aurora

Senior Water Resources Engineer, Aurora Water, 15151 E. Alameda Pkwy., Aurora, CO 80012, 303-739-7326, rvidmar@ci.aurora.co.us

Richard Vidmar is a water resources engineer for Aurora Water specializing in water rights acquisitions, appropriations, and protection in the South Platte Basin. Rich holds a bachelor's degree in civil engineering from Colorado State University. Prior to earning his degree, Rich worked for the U.S. Bureau of Reclamation for six years at the Mt. Elbert power plant's water operations and maintenance division. Rich has been employed at Aurora Water for more than six years, working on many different projects including the Prairie Waters Project. Rich grew up in Buena Vista, CO where his father, Tom, is the superintendent of the Homestake Water Project. Rich also completed the Colorado Foundation for Water Education Water Leaders program.

Conservation's Role in Filling the Gap

Drew Beckwith

Water Policy Manager, Western Resource Advocates, 2260 Baseline Rd., Boulder, CO 80302, 720-763-3726, dbeckwith@westernresources.org, www.westernresourceadvocates.org

Urban water demands are growing rapidly across the Interior West. In our quest to meet these future demands, we are too quick to fall back on 19th and 20th Century approaches that don't mesh well with today's issues and challenges. For our region to maintain the quality of life that supports our economy and environment, we must pursue an alternative, innovative path forward that breaks the habit of getting water at the expense of our rivers and streams. Water conservation, reuse, small structural projects, and sharing with agriculture will become the foundation of this new approach.

As WRA's water policy manager, Drew works closely with water utilities, state officials, and partner organizations around the region to find sustainable ways to meet human water needs. He is responsible for WRA's research, legislative, and policy efforts that aim to advance water conservation efforts and non-traditional water supplies across the Interior West. Prior to WRA, Drew worked for a consulting company in Southern California and for the University of California Cooperative Extension. Drew majored in Geology at Colorado College, and holds a master's degree in Environmental Science and Management from UC Santa Barbara.

Cost of New and Conserved Water

Doug Kenney, Ph.D.

Director, Western Water Policy Program, Natural Resources Law Center, University of Colorado Law School, UCB 401, Boulder, CO 80309-0401, 303-492-1296, douglas.kenney@colorado.edu, www.waterpolicy.info

Municipal water providers have several options for matching available supplies to projected demands. Most approaches are supply-oriented and rely on bringing in "new water" via new river developments, or by transferring already developed water from agriculture or other available sellers. However, these approaches can entail enormous capital expenditures, require large O&M costs (e.g., for pumping), and face environmental and social opposition. Approaches based on managing demand avoid many of these problems, but raise different issues such as consumer acceptance, demand hardening, and impacts to utility revenue streams. Deciding which approach is "best" is a complex and case-specific determination, but among the most obvious points for comparison is an assessment of the differing economic costs. A full assessment of costs requires a consideration of both upfront (capital) costs and ongoing operating costs, as well as a consideration of how those costs are allocated between the utility and the customer. In this presentation, an assessment of the costs of conservation on Colorado's Front Range is presented and compared to costs of supply-oriented management strategies.

Doug Kenney is a senior research associate at the Natural Resources Law Center, located within the University of Colorado Law School, where he directs the Western Water Policy Program. He has written extensively on several water-related issues, including law and policy reform, river basin and watershed-level planning, the design of institutional arrangements, water resource economics, and alternative strategies for solving complex resource issues. Among his publications are [In Search of Sustainable Water Management: International Lessons for the American West and Beyond](#) (2005, Edward Elgar Publishing) and [The Water-Energy Nexus in the Western United States](#) (2011, Edward Elgar Publishing). He is also affiliated with the CU/NOAA



Western Water Assessment, exploring the link between climate change/variability and western U.S. water management. Doug has served as a consultant to a variety of local, state, multi-state, and federal agencies, including several Interior Department agencies, EPA, the U.S. Forest Service, and special commissions (e.g., the Western Water Policy Review Advisory Commission), and national governments and NGOs in Asia and Africa. Additionally, he has made presentations in (at least) 17 states, 6 nations, and 4 continents. He has a Bachelor of Arts in Biology from the University of Colorado, a Master of Science in Natural Resources Policy and Administration from the University of Michigan, and a doctorate in Renewable Natural Resource Studies from the University of Arizona.

Conservation and Drought Planning

Veva Deheza

Section Chief, Office of Water Conservation & Drought Planning, Colorado Water Conservation Board, 1313 Sherman St. Room 721, Denver, CO 80203, 303-866-3441 x3226, veva.deheza@state.co.us, www.cwcb.state.co.us

Veva Deheza is the section chief for the Colorado Water Conservation Board's Office of Water Conservation and Drought Planning. She is responsible for the direction and implementation of statewide water conservation and drought planning programs and projects including providing technical planning assistance to Colorado water providers and local governments. She manages the CWCB's Water Efficiency Grant Program, which grants monies for water conservation, drought mitigation planning, and implementation activities. She serves as a co-chair of the Governor's Water Availability Task Force and coordinates the state's response efforts outlined in the State Drought Plan. Veva provides technical assistance on the Statewide Water Supply Initiative (SWSI) and the 1177 roundtable process, focusing on the conservation and efficiency alternatives to meeting the State's future water needs. Veva is responsible for coordinating all public relations and education efforts for the state's involvement in water conservation initiatives.

Use What You Can Afford

Greg Fisher

Denver Water, 1600 W 12 Ave, Denver, CO 80254, 303-628-6528, greg.fisher@denverwater.org



Thursday, October 20, 10:40 a.m.

The Good, the Bad, and the Ugly (Critters)

Moderator: Pete Conovitz

Colorado Division of Parks and Wildlife, 317 W. Prospect, Fort Collins, CO 80526, 970-472-4356, pete.conovitz@state.co.us

Greenback Cutthroat Trout: Uncertainties and Opportunities

Harry Crockett

Native Aquatic Species Coordinator, Colorado Division of Parks and Wildlife, 317 W. Prospect St., Fort Collins, CO, 80526, 970-472-4339, harry.crockett@state.co.us, www.wildlife.state.co.us

Colorado's extant subspecies of cutthroat trout are all state species of special concern and one—the greenback cutthroat trout—is federally listed as threatened under the Endangered Species Act. The subspecies are so similar in appearance that even experts had difficulty distinguishing them. However, each taxon seemed to be confined to specific drainages, and this pattern appeared to be well-explained by hypothesized colonization events inferred from the distribution of numerous other fish species within Colorado. Specifically, the greenback was considered native to the South Platte and Arkansas, the Colorado River cutthroat to the west slope, and the Rio Grande cutthroat to the Rio Grande. Recently developed genetic techniques confirmed the presence of several discrete cutthroat taxa in Colorado, but cast doubt upon this tidy geographical arrangement. A study published in 2007 found that while three lineages are clearly divergent genetically, two of them are more commingled in their current distributions than was previously supposed, which the authors attributed to widespread undocumented stocking in the late 1800s. The paper received extensive publicity and the Greenback Recovery Team endured considerable unwarranted criticism for “saving the wrong fish.” To clarify the situation, two follow-up studies were initiated. One combines meristic and genetic analysis of every known natural population within the state, to identify any heretofore unrecognized physical characters by which the lineages may be distinguished. The second is a groundbreaking effort to extract DNA from museum specimens collected between 1860-1890 in hopes of reconstructing the historic ranges of these taxa prior to extensive stocking. Neither study is complete but I will present initial findings. A salutary outcome may be that we find we have more pure populations than previously believed, although some of them are not where we used to think they belonged. However, there are more vexing practical implications as well, for example, if plans to reclaim portions of the upper Poudre drainage go forward, which cutthroat should be stocked?

Harry Crockett received his master's degree in Aquatic Ecology from Colorado State University in 2004. He worked for the Colorado Division of Parks and Wildlife since 2005 as an Area Biologist and Aquatic Researcher before moving into his current position as Native Aquatic Species Coordinator. In this role, he oversees the division's recovery efforts for native fish and amphibians statewide. A native of North Carolina, he has made Colorado his home for the past 18 years. Before receiving his M.S., he worked for a number of seasons as a river guide, and continues to fish, canoe, raft, and otherwise enjoy Colorado's outstanding aquatic resources. His household water comes from the upper Colorado via the CB-T project.

Preble's CH, DPS, and SPR: Not an 80s New Wave Band

Craig Hansen

U.S. Fish and Wildlife Service, Fish and Wildlife Biologist, Colorado Field Office, craig_hansen@fws.gov, 303-236-4749

This presentation will include legal and biological updates to the listing and recovery of the federally threatened Preble's meadow jumping mouse.

Craig Hansen is a fish and wildlife biologist with the U.S. Fish and Wildlife Service. He has spent many years trapping, tagging, and radio collaring the federally threatened Preble's meadow jumping mouse in the Pike National Forest at the western extent of the species' range.



The Mountain Pine Beetle Epidemic Spreads Into Ponderosa Pine Forests along the Northern Front Range

Jeff Witcosky

Entomologist, USDA Forest Service, 740 Simms St., Golden, CO 80401, 303-236-9541, jwitcosky@fs.fed.us,
www.fs.fed.us/r2/

The mountain pine beetle epidemic in northern Colorado and southern Wyoming has been underway for fifteen years. During that time this bark beetle has impacted nearly four million acres of pine forests throughout this area. The mountain pine beetle has caused severe losses in lodgepole, ponderosa, and high elevation five-needle pine forests, species of trees that dominate much of the forest cover on the northern Front Range. Over much of the high country west of the Continental Divide, the epidemic has run its course. The focus of mountain pine beetle activity has shifted to the Front Range, where the bark beetle is active from Park County north through Larimer County. For Park County, the epidemic appears to be subsiding, causing only modest losses in the northwestern portion of the county. Substantial losses have been observed in Clear Creek County, but mountain pine beetle populations are declining. The impact of the mountain pine beetle in Jefferson County is limited mostly to the very northwestern portion of the county. Losses of pines in Gilpin County appear to be declining with moderate losses overall. Losses in Boulder and Larimer Counties continue to increase. The most significant area of expanding mortality in ponderosa pine is north of the Poudre River in Larimer County.

Jeff Witcosky received his bachelor's degree from Humboldt State University, CA, in 1975 and his master's and doctorate degrees in entomology from Oregon State University in 1981 and 1985, respectively. He worked in forest entomology for 29 years, mostly with the USDA Forest Service, Forest Health Protection. He currently manages a small forest pest management staff that works on forest insects and diseases in northern Colorado and southern Wyoming. Their major problem areas include the mountain pine beetle, the spruce beetle, exotic, invasive bark beetles, white pine blister rust of five-needle pines, and the identification and management of hazardous trees on federal lands.

Invasive Species In Colorado

Elizabeth Brown

State Invasive Species Coordinator, Colorado Division of Parks and Wildlife, 6060 Broadway, Denver, CO 80216, 303-547-8690, elizabeth.brown@state.co.us, <http://wildlife.state.co.us/Fishing/MandatoryBoatInspections.htm>,
<http://wildlife.state.co.us/WildlifeSpecies/Profiles/InvasiveSpecies/ZebraandQuaggaMussels.htm>

This presentation will provide a historical summary and current status of the State Invasive Species Program, including current distributions for known positive waters with aquatic nuisance species (ANS). She will provide an overview of the Colorado's least wanted species and their impacts on the natural resources and the human use of those resources. Species included are zebra mussels, quagga mussels, New Zealand mudsnails, rusty crayfish, Eurasian watermilfoil, and water hyacinth. Elizabeth will review the recommendations for cleaning boats, waders and other equipment to prevent the spread of invasive species through human movements. Finally, she will provide resources to gain additional information for ANS, noxious weeds or exotic forest insect management.

Elizabeth Brown is the State Invasive Species Coordinator with Colorado Parks and Wildlife. She moved to Colorado from her hometown Chicago in 2000 and began mapping invasive species shortly after at Chatfield and Cherry Creek State Park. Elizabeth served as the first Early Detection and Rapid Response Specialist for the Colorado Department of Agriculture's State Weed Program. She then worked as the Stewardship Coordinator for Colorado State Parks, which included coordinating their invasive species program and chairing the State ANS Steering Committee. Now, with CDOW since July 2008, she mainly coordinates of the State Aquatic Nuisance Species Program. However, the State Invasive Species Program was new to the state in 2008 and consolidates statewide aquatic nuisance species and invasive animals management, along with noxious weeds and forest pest management activities in State Wildlife Areas into one cohesive program. Elizabeth lives on the Front Range with her husband, three year old daughter and 10 month old son. They spend most summer weekends gardening or hiking, canoeing and camping, and are looking forward to teaching their daughter to ski this winter!



Thursday, October 20, 12:00 p.m.

Green River (Keynote Luncheon)

Bill Ritter, Jr.

Director and Senior Scholar, Center for the New Energy Economy, Colorado State University, 1036 Campus Delivery, Fort Collins, CO 80523-1036, (970) 491-2903, www.cnee.colostate.edu

Bill Ritter Jr. is currently the Director of the Center for the New Energy Economy (CNEE) at Colorado State University. The Center started February 1, 2011 with Bill as the founding director. In addition to the director, the center now employs an assistant director, two senior policy advisors, and an executive assistant.

Bill was elected as Colorado's 41st governor in 2006—the first Colorado-born governor in more than 35 years. Bill led Colorado forward by bringing people together to tackle some of our state's biggest challenges. During his four year term, Bill established Colorado as a national and international leader in renewable energy by building a New Energy Economy that is creating thousands of new jobs and establishing hundreds of new companies; enacted an aggressive business-development and job-creation agenda that is focused on knowledge-based industries of the future, such as energy, aerospace, biosciences, information technology and tourism; initiated sweeping K-12 education reforms to give Colorado children the skills and knowledge they need to compete and succeed in a 21st century global economy; and improved access to quality and affordable health care for many of the 800,000 Coloradans who lack health coverage.

Bill served as Denver's District Attorney from 1993 to January 2005. He earned a national reputation as one of the country's most effective and innovative prosecutors, and several of his programs continue to serve as state and national models.

The sixth of 12 children, Bill was raised on a small farm in Arapahoe County. He was a member of the first graduating class of Gateway High School (1974), and he earned his bachelor's degree in political science from Colorado State University (1978) and his law degree from the University of Colorado (1981).

Bill is married to Jeannie, and before his serving as District Attorney, he and Jeannie operated a food distribution and nutrition center in Zambia. They have four children; August, Abe, Sam, and Tally.

Thursday, October 20, 1:20 p.m.

Good Vibrations (Energy)

Moderator: Marcella Hutchinson,

Environmental Scientist, US EPA Region 8, 1595 Wynkoop St., Denver, CO 80202, (303) 312-6753, hutchinson.marcella@epa.gov

Marcella Hutchinson is an Environmental Scientist with the Office of Ecosystems Protection and Remediation at the United States Environmental Protection Agency Region 8 office in Denver, Colorado. She is responsible for Watershed and Non Point Source programs for the state of Colorado. She has a Bachelor of Arts and a Master of Science, both in Geology, from the University of Colorado at Boulder. Marcella has worked in EPA's water programs since 1996.



Energy, Water, and Agriculture in a Drying Southwest: A Case Study of the South Platte Basin

Stacy Tellinghuisen

Senior Energy/Water Policy Analyst, Western Resource Advocates, 2260 Baseline Rd., Ste. 200, Boulder, CO 80302, 303-444-1188 x216, stacy@westernresources.org, www.westernresourceadvocates.org

Western utilities and government agencies are developing energy and transmission plans that will influence the region for the next several decades and beyond. If these strategies do not consider the availability of water, new electric facilities could have vast impacts on water resources and sectors like agriculture, which uses the majority of water in the West today. Watersheds throughout the West face these challenges, but they are particularly clear in the South Platte River basin in Colorado.

Working in close collaboration with colleagues at national labs and Colorado universities, Western Resource Advocates evaluated the impacts of climate change, energy and transmission scenarios, and municipal growth on water resources in the South Platte River Basin, as well as the resulting economic impacts on the agricultural sector. The energy scenarios demonstrate three divergent paths in the South Platte: a water-efficient, high-wind future; a carbon- and water-intensive “business as usual” future; and a technology-focused future that reduces carbon emissions but increases water use. The scenarios and results serve as a timely and valuable template for integrating water into regional energy and transmission planning, and will likely be replicable throughout the region.

Stacy Tellinghuisen works on both sides of the energy/water nexus, researching the impacts of energy development on water resources and the energy impacts of new and existing water supplies. She has focused on how public utility commissions should consider water in electric resource planning, and worked to quantify the opportunities for water utilities to reduce their energy demands and greenhouse gas emissions through conservation programs, reuse, and flexible leasing arrangements. Stacy received a master’s degree in Environmental Science and Management from U.C. Santa Barbara in 2007 and a Bachelor of Arts from Carleton College in 2000.

Shale Oil from the Niobrara, Water Demand High, Impacts Unstudied

Weston Wilson, retired EPA

Getting the Power Out: Challenges of Small Hydropower Development

Daniel Zimmerle

Adjunct Professor and Power System R&D Manager, Engines and Energy Conversion Laboratory, Colorado State University, 430 N. College Ave., Fort Collins, CO 80524, 970-581-9945, dan.zimmerle@colostate.edu, <http://eecl.colostate.edu/>, <http://www.integridlab.com/>

Recent changes in permitting process have improved the prospects for developing small hydroelectric plants in irrigation systems and other man-made waterways. Many enablers are readily available – turbines, hydraulic designs, interconnect procedures – but significant financial, permitting and construction challenges remain. The presentation will review recent work on small hydro systems and prospects for future development.

Daniel Zimmerle is an adjunct professor at Colorado State University and Power Systems R&D Manager at the Engines and Energy Conversion Laboratory. His research concentrates on microgrids and the development, integration and field assessment of distributed, renewable, and waste-heat electrical generation systems. Prior to CSU, Mr. Zimmerle served as the Chief Operating Officer at Spirae, Inc. (a smart grid controls company) and has 20 years of experience at Hewlett Packard and Agilent Technologies including experience as both a division general manager and R&D manager in several businesses.



Low-Head Hydropower Opportunities In the South Platte River Basin

Lindsay George, Ph.D., P.E.

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Applegate Group and Colorado State University recently completed a study of low head hydropower opportunities across the State of Colorado. Irrigation companies are looking towards hydropower as a potential additional revenue stream to assist with repairing and replacing aging infrastructure. In the study, low head hydropower technologies were reviewed and matched with typical irrigation structures seen in Colorado's irrigation systems. The final report is a guidance document available to irrigation companies and canal owners interested in pursuing hydropower. This presentation will focus on typical structures in the South Platte River Basin, and opportunities that exist for developing hydropower.

Lindsay George is a water resources engineer with Applegate Group out of Glenwood Springs. She earned her Bachelor of Science in Civil Engineering from the University of Colorado and also holds a doctorate in civil and environmental engineering from the University of Vermont. Lindsay has worked as a Civil Engineer for 10 years.

Applegate Group is a full service civil engineering firm that focuses on raw water infrastructure and water rights. Lindsay has been with the company for three years, and during that time she has worked on various canal and reservoir projects as well as getting deeply involved with hydropower in Colorado.



Want to take another look at the PowerPoint Presentations?

Go to www.southplatteforum.org



Thanks for coming... See You Next Year!!

**The 23rd Annual South Platte Forum
October 24-25, 2012**



Poster Abstracts

Colorado Water Quality Monitoring Council

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The Colorado Water Quality Monitoring Council serves as a statewide collaborative body, open to all, to help achieve effective collection, analysis and dissemination of water quality data, and monitoring information. The council seeks to improve the linkage between the information needs of policy and decision makers with efforts to collect and assess data. The Council also promotes effective monitoring programs that include the components of goal identification, data collection, analysis, storage, retrieval, and reporting/dissemination of information.

The Colorado Data Sharing Network (CDSN) is a collaborative project envisioned by the Council in 2004 (www.coloradowaterdata.org). The CDSN was formed to address many of the issues that have historically been barriers to effective sharing of water quality information in Colorado. CDSN products and services seek to satisfy reporting requirements for Colorado Non-Point Source project sponsors. Project results will also address top priorities echoed throughout the collective watershed management, assessment and monitoring community in Colorado. The aim of the CDSN is to leverage the Colorado Water Quality Monitoring Council into a collective and resourceful voice for monitoring issues in the future. Partners associated with the CDSN project include EPA, the Colorado Water Quality Control Division, South Plate Coalition for Urban River Evaluation, and the Colorado Watershed Assembly.

CDSN products and services include:

- One of the primary water quality data management systems to find and use Colorado water quality data.
- A holistic data management system that supports an interactive web-based map, shares information about sampling locations, methods, objectives and ownership, easy data input and retrieval and provides simple data manipulations like summary statistics and graphics.
- A data management system that meets requirements of the Colorado's NPS Grant Program.
- A data management system targeted at local data providers who need assistance, access to other's data, or for their data to reach broader audiences.

A poster presentation by the Colorado Water Quality Monitoring Council at the 2011 South Platte Forum will provide updates to the poster presented at the 2009 Forum. The display will focus on new data sharing web tools such as the interactive Google map utility and water quality database.

Educators: Let's Measure Rain and Snow!

Noah Newman

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The Community Collaborative Rain, Hail and Snow network (CoCoRaHS.org) invites every school in Colorado to be a rain gauge volunteer. Teachers will learn how to take accurate measurements and how their students can help scientists track our climate and water supplies by reporting local precipitation. It's easy, fun and takes only a few minutes per day!

As many people know, the source of our water here in Colorado is the rain and snow that falls from the sky. The weather brings our water. But it brings it sporadically, varying greatly from place to place and year to year. Our office, the Colorado Climate Center, is responsible for tracking statewide precipitation and other climatic conditions, and we've done this for many decades. We do the best we can, but there aren't enough weather stations. That's where schools come in. Students all across our state will be teaming up with Colorado's weather and water experts to measure, analyze and study the water that falls from the sky. We hope



schools all over the state can help us. We want every school in every district to get involved.

We are off to a good start. Fundraising is underway and sponsors are providing high quality rain gauges for every school (1800+) in Colorado. Weather, climate and water experts are volunteering to be mentors to help every school. We are now working to identify individuals from each school (teacher, administrator, or school volunteer) that will be the point of contact and representative to the Network. Measuring precipitation only takes a minute or two a day for each school, but when rain gauge reports are combined statewide, we will track water on arrival in a way that has never been done before. Maps will be updated every day showing data from every gauge in the state. Lesson plans and activities that meet the newest State Standards will be available. This can then be the jumping off point for almost any discussion or exploration of water – past, present or future.

This will be in conjunction with the upcoming statewide campaign, Water 2012 – a year of water celebration and education for the entire state of Colorado. This celebration of our amazing and essential water resources will span two school years: 2011-12 and 2012-13. Activities and opportunities are already being planned. We hope you join in.

Agricultural Water Conservation Clearinghouse: An Online Tool for Water Resource Professionals, Managers and Academia

Julie Kallenberger

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Population growth and climate variability are increasing pressures on limited water resources, and extensive collaboration is needed to develop long-term working solutions to this complex issue. Agriculture consumes an estimated 90% of available water resources in the western U.S., and future water needs for an expanding urban population will likely come from agriculture. Reduced water resources in agriculture will add to the challenge of meeting a growing global demand for agricultural outputs. Therefore, it is increasingly urgent for farmers, water managers, extension agents, and policy-makers to understand agricultural water conservation methodology, technology, and policy to make informed management decisions. The USDA-NIFA Northern Plains and Mountains (NPM) Regional Water Team has addressed the need for increased knowledge, understanding, and adoption of agricultural water conservation through an innovative web-based project. The Agricultural Water Conservation Clearinghouse (AWCC) seeks to join communities of practice to collaboratively address the complex issues of agricultural water use.

The AWCC is designed as a comprehensive resource for the latest news, research, literature and tools related to agricultural water conservation. The focal point of the AWCC is a comprehensive library that identifies published materials on all aspects of agricultural water conservation. The library contains over 3,500 entries including refereed journal articles, books, reports, theses and dissertations, conference proceedings. The library has been searched by over 18,500 users since it was unveiled in 2008 and participation continues to grow. Building the AWCC through partnerships, the NPM Team has formed relationships with several irrigation and water-related organizations. These partnerships have increased access to proceedings and reports published through these organizations. Until recently, much of this literature has only been available in hard copy and was not available from traditional library or web sources.

The AWCC is available online at www.agwaterconservation.colostate.edu

Taking SPARROW Predictions to the Web: A Tool for Research and Resource Management

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The U.S. Geological Survey (USGS) National Water Quality Assessment Program (NAWQA) has completed a number of water-quality prediction models for nitrogen and phosphorus for the conterminous United States as well as for regional areas of the nation. In addition to estimating water-quality conditions at unmonitored streams, the calibrated SPatially Referenced Regressions On Watershed Attributes (SPARROW) models can be used to produce estimates of yield, flow-weighted concentration, or load of constituents in water under various land-use condition, change, or resource management scenarios. A Web-based decision support infrastructure has been developed to provide access to SPARROW simulation results on stream water-quality conditions and to offer sophisticated scenario testing capabilities for research and water-quality planning via a



graphical user interface with familiar controls. The SPARROW Decision Support System (DSS) is delivered through a web browser over an Internet connection, making it widely accessible to the public in a format that allows users to easily display water-quality conditions and to describe, test, and share modeled scenarios of future conditions. SPARROW models currently supported by the DSS are based on the modified digital versions of the 1:500,000-scale River Reach File (RF1) and 1:100,000-scale National Hydrography Dataset (medium-resolution, NHDPlus) stream networks.

Modeling nutrient sources and transport in the Missouri River Basin with the SPARROW watershed model

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SPATIALLY Regression on Watershed attributes (SPARROW) models were developed to provide spatially explicit information on local and regional total nitrogen and total phosphorus sources and transport in the Missouri River Basin. Specific objectives of the modeling study were to (1) identify the major nutrient sources and terrestrial and aquatic delivery factors influencing total nitrogen and total phosphorus loads in the Missouri River Basin and their delivery to the Mississippi River, and (2) evaluate the effects of reservoir storage and irrigation on the nutrient loads. The SPARROW model output provides information that can be used to target areas for monitoring, assess source-reduction scenarios, and inform stakeholders of major nutrient sources and transport processes in their areas and how their areas compare to the region.

Results from the Missouri River Basin SPARROW models indicate that agricultural inputs from fertilizer and manure were the largest nutrient sources throughout a large part of the basin, although atmospheric and urban inputs were large sources in some areas. Additionally, sediment mobilized from stream channels was a source of phosphorus in medium and larger streams. The highest delivered nutrient yields to the Mississippi River were found in the southeastern part of the basin and the Platte River subbasin. Irrigation on agricultural land was estimated to decrease the nitrogen load reaching the Mississippi River by as much as 17 percent, likely as a result of increased anoxia and denitrification in the soil zone. Approximately 16 percent of the nitrogen load and 33 percent of the phosphorus load that would have otherwise reached the Mississippi River was retained in reservoirs and lakes throughout the basin. Nearly half of this attenuation occurred in the seven largest reservoirs and one natural lake. Nearly the entire instream nutrient load leaving the Kansas River and Platte River subbasins reached the Mississippi River, which may be explained by subbasin characteristics and locations of major point and nonpoint sources. Understanding the sources and processes influencing nutrient transport in the Missouri River Basin has local, regional, and national implications for nutrient management efforts.

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**If you have a poster you would like to present at the 2012 South Platte Forum,
Oct. 24-25, email a one-page abstract to Jennifer Brown,
jennifer@jbbrown.com, by Aug. 1, 2012.**

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