



# **Water 2012: Celebrating Along the Way**

*Proceedings of the 23rd Annual South Platte Forum  
October 24-25, 2012  
Longmont, Colorado*

Jennifer Brown, Editor

October 2012

Information Series No. 114



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# Water 2012: Celebrating Along the Way

**Proceedings of the 23rd Annual South Platte Forum**  
October 24-25, 2012—Plaza Conference Center—Longmont, Colorado

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

# Water 2012: Celebrating Along the Way

Wednesday, Oct. 24

**7:45 Registration and Continental Breakfast**

**8:20 Welcome**—Reagan Waskom, Colorado Water Institute

**8:30 A Ditch in Time: The City, the West and Water**

Patty Limerick, Director, Center for the American West; author of *A Ditch in Time*

**9:00 The Way Things Were**

Moderator: Brian Werner, Northern Water

- *The Republic of Nature: American Environmental History and Colorado Rivers*  
Mark Fiege, author of *The Republic of Nature: An Environmental History of the United States*
- *Water: Colorado's Real Gold*  
Dick Stenzel, photographer, water engineer, author of *Water: Colorado's Real Gold*

**10:00 Break**

**10:30 The Way Water Works**

Moderator: Pete Conovitz, Colorado Division of Parks and Wildlife

- *South Platte River Compact Simplified*  
David Robbins, Hill & Robbins, PC
- *The Basics of Exchanges*  
Alan Berryman, Northern Water
- *How it Works: A City-Specific Example*  
Jon Monson, City of Greeley
- "You Make the Call" Interactive Game

**12:00 Keynote Luncheon**

- *Friends of the South Platte Award*  
Presented to Coalition for the Upper South Platte; Accepted by Carol Ekarius, Executive Director
- *Keynote Presentation*  
Mike King, Executive Director, Colorado Department of Natural Resources

**1:30 Water Ways**

Moderator: Troy Bauder, Colorado State University Extension

- *From Sewers to Successes*  
Jeff Shoemaker, The Greenway Foundation
- *Water Management Effects on Water Quality*  
William M. Lewis, Jr., University of Colorado Boulder
- *Nitrogen Deposition*  
Jay Ham, Colorado State University

**2:45 Celebration Break (with cake and prizes!)**

**3:00 The Way to Go: South Platte Roundtable Portfolio Tool**

Moderator: Sean Cronin, St. Vrain and Left Hand Water Conservancy District

- *Agriculture*  
Jim Yahn, IBCC Representative, South Platte Roundtable
- *Municipal*  
Harold Evans, Weld County Municipal Representative, South Platte Roundtable
- *Environmental*  
Bob Streeter, Environmental Representative, South Platte Roundtable

**4:00 The Business Ways of Water (The Colorado Innovation Network)**

Moderator: Reagan Waskom, Colorado Water Institute

- Brian Ashe, CWIC Chairman; Riverside Technologies
- Stephen Smith, Regensis Management Group
- Josh Birks, City of Fort Collins

**5:00 Reception—Colorado Water Congress Professionals Outreach, Networking, and Development (POND)**

Left Hand Brewing Company Tasting Room—1265 Boston Ave., Longmont

# Water 2012: Celebrating Along the Way

Thursday, Oct. 25

**7:45 Registration and Continental Breakfast**

**8:30 Finding a Way: Oil and Water**

Moderator: Kate Fay, U.S. Environmental Protection Agency Region 8

- *Moving Beyond Misinformation: Education and Engagement*  
Sarah Landry, Colorado Oil & Gas Association
- *Managing the Benefits and Impacts of Oil, Gas and Water: A County Government Perspective*  
Douglas Rademacher, Weld County Commissioner
- *Addressing Water and Community Impacts from Oil and Gas Development*  
Laura Belanger, Western Resource Advocates
- *Is Water Management the Key to Environmentally Acceptable Shale Oil and Gas Production?*  
Ken Carlson, Colorado Energy Water Consortium

**10:15 Break**

**10:45 Climate: Way More than Weather**

Moderator: Rich Vidmar, City of Aurora

- *Another Crazy Year in Colorado – Where Does 2012 Fit in the Bigger "Climate" Picture?*  
Nolan Doesken, Colorado State Climatologist
- *We've Been Here Before: A Multi-Century Tree-Ring Perspective on South Platte Basin Drought*  
Jeff Lukas, Western Water Assessment
- *Implications of Climate Change for Grasslands and Riparian Areas in the Western Great Plains*  
Jack Morgan

**12:00 Keynote Luncheon**

- *Ten Years of Climate Science and Sustainability: How Should We Deal with Uncertainty?*  
Bradley H. Udall, Western Water Assessment

**1:20 Forum Ends**

Speaker PowerPoint Presentations are available at  
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**Wednesday, Oct. 24, 8:20 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. Reagan's teaching responsibility at CSU is for the Graduate Water Resources Seminar. He additionally supervises the CSU Extension Water Outreach program and personnel.*

**Wednesday, Oct. 24, 8:30 a.m.**

## **Opening Keynote**

### **A Ditch In Time: The City, the West, and Water**

**Patty Limerick**

*Author; Faculty Director and Chair of the Board, Center of the American West, University of Colorado at Boulder, 282 UCB, Boulder, CO 80309, 303-492-4879, pnl@centerwest.org, www.centerwest.org*

Water holds an underexploited capacity to show the connections that tie together distant places and seemingly unrelated groups.

Patty will trace the history of water in Denver using this case study to explore important and often under-recognized patterns in regional and national history. With wit and humor rarely encountered in presentations about natural resources and bureaucracies, Patty will raise questions of consequence about the complex relationship among cities, suburbs, and rural areas, the crucial role of engineering in shaping the West, and the varying roles of contention and cooperation, litigation, and negotiation at work in the control of water.

Challenging the habits of mind cultivated by the last century, Patty Limerick looks to reconnect American citizens to the origins of the natural resources on which they depend.

*Patty Limerick is the faculty director and chair of the Board of the Center of the American West at CU, where she is also a professor of history. Patty has dedicated her career to bridging the gap between academics and the general public and to demonstrating the benefits of applying historical perspective to contemporary dilemmas and conflicts.*

*Patty has received a number of awards and honors recognizing the impact of her scholarship and her commitment to teaching, including the MacArthur Fellowship and the Hazel Barnes Prize, CU's highest award for teaching and research. She has served as president of several professional organizations, advised documentary and film projects, and done two tours as a Pulitzer Nonfiction jurist, as well as serving as chair of the Pulitzer jury in History for 2011. She is currently serving as the vice president for the Teaching Division of the American Historical Association. Patty regularly engages the public on the op-ed pages of local and national newspapers, and in the summer of 2005 she served as a guest columnist for The New York Times.*





**Wednesday, Oct. 24, 9:00 a.m.**

## **The Way Things Were**

**Moderator: Brian Werner**

Public Information Officer, Northern Water, 220 Water Ave., Berthoud, CO 80513, 970-622-2229, [bwerner@ncwcd.org](mailto:bwerner@ncwcd.org), [www.northernwater.org](http://www.northernwater.org)

*Brian is the public information officer for Northern Water and serves as the public affairs coordinator for the Northern Integrated Supply Project, a water storage project currently going through the environmental permitting process. Brian is also on the management team for the state-wide Water Year 2012 campaign and serves as the chair of its speaker's bureau committee.*

*As PIO for Northern Water, Brian oversees public affairs for the district including media relations, youth and public education, facility tours, and informational publications. He has coordinated more than 50 children's water festivals in Colorado and produced a video on the Colorado-Big Thompson Project.*

*Brian was born in Colorado Springs. He graduated from the University of Northern Colorado with a degree in history and followed with a Master of Arts in history from Colorado State University in Fort Collins. Brian has continued his academic training by researching and giving presentations on the history of water development in Colorado and the American West. He has written extensively about water development and related issues.*

*Brian was chairman of the Poudre River Trust for five years and helped organize the first ever Riverfest and cleanup in 1994. He helped lead successful efforts to pass county-wide open space taxes in 1995 and 1999. He is on the Board of Directors of the Four States Irrigation Council, a commissioner for the Poudre Heritage Alliance, and a member of the Public Affairs Committee of the Colorado River Water Users Association.*

## **The Republic of Nature: American Environmental History and Colorado Rivers**

**Mark Fiege**

Author; Associate Professor of History, Colorado State University, Department of History, Fort Collins, CO 80523, 970-491-6468, [mark.fiege@colostate.edu](mailto:mark.fiege@colostate.edu), [www.republicofnature.com](http://www.republicofnature.com)

Every river is unique, with its own distinctive history that is the product of geology, geography, environmental change, and human actions through time. On the South Platte as on other western American rivers, citizens have both fought over and cooperated in the development and distribution of water. This presentation will survey the characteristics of Platte River history that are like and unlike the histories of other western streams. Placing the South Platte in this comparative context will yield a different view of the river and the challenges that its human communities have faced over the past 150 years.

*Mark Fiege is an associate professor of history at Colorado State University, where he researches and teaches the history of the American West and U.S. environmental history, assists Morgan Library's Water Resources Archive, and, as a faculty affiliate of the Public Lands History Center, oversees various national park and water history projects. He is the author of *Irrigated Eden: The Making of an Agricultural Landscape in the American West* and, most recently, *The Republic of Nature: An Environmental History of the United States*.*

**Speaker PowerPoint Presentations are available at  
[www.southplatteforum.org](http://www.southplatteforum.org)**



## **Water: Colorado's Real Gold**

### **Dick Stenzel**

*Author; Senior Water Resource Engineer, Applegate Group, Inc., 1490 West 121st Ave., Ste. 100, Denver, CO 80234, 303-452-6611, dickstenzel@applegategroup.com*

*Dick has more than thirty-one years in water rights administration and water court activities with extensive experience in review and assistance in development of plans for augmentation and substitute supply plans. He is recognized as an expert witness in the areas of water rights administration and consumptive use. Dick has provided support to the state engineer and the Attorney General's office with regard to potential water rights issues associated with Water Court applications in all water divisions. He has testified in Water Court as an expert witness on the issues of water rights administration, consumptive use values, lawn grass irrigation return flow methodologies, groundwater modeling, and accounting requirements that would aid in the administration of the decrees before Water Court.*

*Serving the threatened and endangered  
species of the Platte River Basin  
as well as the people who live here.*



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RECOVERY IMPLEMENTATION PROGRAM

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**Wednesday, Oct. 24, 10:30 a.m.**

## **The Way Water Works**

**Moderator: Pete Conovitz**

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

### **South Platte River Compact Simplified**

**David Robbins**

Hill & Robbins, P.C., 1441 18th St., Ste. 100, Denver, CO 80202, 303-296-8100, [davidrobbins@hillandrobbins.com](mailto:davidrobbins@hillandrobbins.com), [www.hillandrobbins.com](http://www.hillandrobbins.com)

*David Robbins is president and co-founder of Hill & Robbins, P.C. where his practice emphasizes the fields of water and natural-resources law, water quality, and environmental law. Prior to entering private practice, David served in the U.S. Army (Captain, 1969-1972) and with the U.S. Environmental Protection Agency, Region VIII (1973-1974). He then joined the Colorado Attorney General's Office as First Assistant Attorney General and head of the Natural Resources Section (1975-77), and was later appointed Deputy Attorney General (1977-1978). David represented the State of Colorado in a variety of interstate water matters and served as counsel to the state engineer in adjudication proceedings and trials concerning basin-wide rules and regulations. He also represented the Colorado Water Conservation Board and successfully defended the constitutionality of the state's first instream flow protection law.*

*Since 1981 David has served as general counsel to the Rio Grande Water Conservation District, where he has led the efforts to defeat speculative proposals to mine the ground water of Colorado's San Luis Valley (see *AWDI v. City of Alamosa*), which ultimately resulted in Congressional action on a bill David initially drafted to create the Great Sand Dunes National Park and Preserve. From 1985 to 2011 David served as counsel of record for the State of Colorado in the U.S. Supreme Court case of *Kansas v. Colorado*, No. 105 Original (October Term, 1985), involving the Arkansas River Compact, both before the special master and the Court. David has served as general counsel to the Republican River Water Conservation District since its creation in 2004 and as special counsel to the Southwestern Water Conservation District for more than 20 years.*

*David is a former member of the Colorado Water Conservation Board (1980-89) and served as its chairman in 1985-86. He was a member of the Colorado River Salinity Control Forum and the Colorado River Salinity Control Advisory Council, representing Colorado from 1979 to 2003 and from 2008 up to the present. He served as the Forum's vice chairman from 1981 to 1984 and from 2001 to 2003, and as its chairman from 1984 to 1990. He and has served on the Colorado Water Congress board of directors for many years and as its President in 2005-06. He was named the Colorado Water Lawyer of the Year in 2012. David is a fellow of the American College of Trial Lawyers and the American Bar Foundation and serves on the board of directors of the Colorado Water Trust, of which he is a founding board member.*







## Basics of Exchanges

### Alan Berryman

Assistant General Manager, Northern Water, 220 Water Ave., Berthoud, CO 80513, 970-622-2235, alanberryman@northernwater.org, www.northernwater.org

Exchanges were conceived to provide additional flexibility and greater use of water in the state and have been operated in Colorado since the concept was introduced in the statutes in the late 1890s. However, Colorado statutes provide minimal definition regarding exchanges, and limited case law exists regarding exchanges. While the term “exchange” has been applied to many water use operations by water users, this presentation focuses upon appropriate rights of exchange and presents the essential elements of exchanges, conditions and issues associated with exchanges, and examples of the way exchanges work.

*Alan Berryman has worked for the Northern Colorado Water Conservancy District since 1995 and is currently the assistant general manager overseeing the Engineering Division. Prior to coming to the district, Alan worked for the Colorado Division of Water Resources as the Division Engineer for the South Platte basin for 10 years. Prior to joining the Division of Water Resources in 1981, Berryman was a consultant in the area of water resources engineering and hydraulics. Berryman has a Bachelor of Science in civil engineering and a Master of Science in water resources from Colorado State University.*

## Greeley: a Specific Example

### Jon Monson

City of Greeley, 1100 10th St., Ste. 300, Greeley, CO 80631, 970-350-9812, lory.stephens@greeleygov.com, www.greeleygov.com

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**Wednesday, Oct. 24, 12:00 p.m.**

## **Keynote Luncheon**

**Sponsored by: Deere & Ault Consultants, Platte River Recovery Implementation Plan, Colorado Corn, Regensis Management Group, Consortium for Research and Education on Emerging Contaminants, and South Platte Roundtable**

### **Friends of the South Platte Award Presentation**

Presented to Coalition for the Upper South Platte

Accepted by Carol Ekarius

*Executive Director, Coalition for the Upper South Platte, P.O. Box 726, Lake George, CO 80827, 719-748-0033, carol@uppersouthplatte.org, www.uppersouthplatte.org*

The Coalition for the Upper South Platte (CUSP) formed as a voluntary watershed group in 1998. Its mission is protecting the water quality and ecological health of the watershed, through the cooperative efforts of stakeholders, with emphasis on community values and economic sustainability. Since that time, CUSP has grown into a nationally-respected, place-based environmental group with a staff of 25. CUSP tackles projects in, and sometimes around the perimeter of, the 2,600 square-mile watershed above Strontia Springs Reservoir. Whether we are working on river restoration, fire rehab, forest health, trails, weeds, or environmental education, our goal is to foster a healthy watershed, now and in the future!

*Carol Ekarius was hired in 1999 as the Executive Director of the Coalition for the Upper South Platte. When not overseeing the staff and programs of CUSP, she writes books on small-scale agriculture.*

### **Keynote Presentation**

Mike King

*Executive Director, Colorado Department of Natural Resources, 1313 Sherman St., Room 718, Denver, CO 80203, 303-866-3311, Mike.King@state.co.us*

**Have a nominee for the Friends of the South Platte?**

**Let us know on your evaluation!!**

# 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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**Don Ament**

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2009 Friend of the South Platte

**Les Williams**

2010 Friend of the South Platte

**Tom Cech**

2011 Friend of the South Platte

**Coalition for the Upper South Platte**

2012 Friend of the South Platte

To nominate an individual or organization for the Friends of the South Platte award, visit [www.southplatteforum.org](http://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](http://www.johnfielder.com).*



**Wednesday, Oct. 24, 1:30 p.m.**

## **Water Ways**

### **Moderator: Troy Bauder**

*Extension Water Quality Specialist, Colorado State University Extension, Department of Soil and Crop Sciences, Fort Collins, CO 80523-1170, 970-491-4923, troy.bauder@colostate.edu*

*Troy Bauder, extension water quality specialist in the Department of Soil and Crop Sciences at Colorado State University, is responsible for conducting statewide educational and applied research programs on water quality, especially related to protection of groundwater quality from impairment to agricultural chemicals. His research and outreach expertise include nutrient and irrigation management, particularly as related to water quality and conservation. Troy received his Bachelor of Science in agronomy and his Master of Science in soil science from Colorado State University.*

### **From Sewers to Successes**

#### **Jeff Shoemaker**

*Executive Director, The Greenway Foundation, The Foundation for Colorado State Parks, 5299 DTC Blvd., Ste. 710, Greenwood Village, CO 80111, 303-818-8078, jeff@thefcsp.org, www.greenwayfoundation.org, www.thefcsp.org*

In 1974 Denver's South Platte River was little more than a flowing sewer. Thirty-eight years later, more than \$100 million of public and private funding has been invested in Denver's greatest natural resource, resulting in more than \$10 billion of positive economic impact for our state's capitol. Learn how this nationally recognized example of urban waterway reclamation has transformed a sewer into success!

*Since 1982 Jeff Shoemaker has been the executive director of The Greenway Foundation, the non-profit organization that initiated the reclamation of the Denver's South Platte River and its tributaries. Since its founding in 1974, The Greenway Foundation has collaborated with countless public and private partners to create more than \$100 million of environmental and recreational enhancements to these urban waterways which has in turn created more than \$10 billion of economic benefits to the surrounding area.*



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## **Effects of Water Management on Water Quality: Examples from Colorado**

**William M. Lewis, Jr.**

*Associate Director, Center for Limnology, Cooperative Institute for Research in Environmental Sciences, University of Colorado Boulder, 216 UCB, CIRES, Boulder, CO 80309-0216, 303-492-6378, lewis@spot.colorado.edu, ci-res.colorado.edu/limnology*

In Colorado we are acclimated to the intensive management of water. The justification of water management and its underlying legal basis is beneficial use, which is an enormous asset for Colorado. Maximizing beneficial use has some incidental costs, some of which are related to water quality. Most effects of water management on water quality can be clustered under three headings: depletion of flow, augmentation of flow, and impoundment of flow. Numerous examples are available for each of these influences in Colorado.

*William Lewis is professor of ecology and evolutionary biology at the University of Colorado Boulder. He currently serves as the director of the Center for Limnology and also as interim director for the Cooperative Institute for Research in Environmental Sciences at CU Boulder. He obtained his doctorate from Indiana University in 1973 and joined CU Boulder in 1974. His interests include water quality, aquatic life, and aquatic ecosystems in Colorado and globally. He is past president of the American Society of Limnology and Oceanography and recipient of the Renewable Natural Resources Foundation's Sustained Achievement Award and of the Naumann-Thienemann Medal for achievement in studies of inland waters.*

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## Nitrogen Deposition

Jay M. Ham, Ph.D.

Professor of Environmental Physics, Department of Soil and Crop Sciences, C107 Plant Sciences, Colorado State University, Fort Collins, CO 80523, 970-491-4112, [jay.ham@colostate.edu](mailto:jay.ham@colostate.edu), <http://soilcrop.colostate.edu/ham/index.html>

Atmospheric deposition of reactive nitrogen is having an adverse effect on ecosystems on the eastern slopes of the Rocky Mountains, specifically the alpine catchments in Rocky Mountain National Park. There are more than one million cattle on feed in Colorado, with a large concentration of feedlots and dairies on the plains east of the mountains. These livestock operations have been implicated as a contributor of nitrogen being deposited in the park. Unfortunately, the uncertainty around feedlot emissions and factors affecting transport in the atmosphere make it difficult to evaluate the effectiveness of mitigation strategies and the subsequent impact on alpine deposition. Furthermore, there have been very few direct measurements of ammonia emissions in Colorado. Thus, determining the sources of nitrogen being deposited in the mountains and the long-term impacts on environmental resources (soil, water, and air) remains uncertain. The objectives of this presentation are: 1) review the background of the atmospheric nitrogen deposition issue in Colorado and its implications for agriculture and water resources, 2) describe new technologies being developed to measure ammonia emissions from livestock operations and other strong sources—including non Ag sources, and 3) discuss management strategies for reducing the environmental impacts of ammonia on air and water quality.

*Jay Ham joined the Colorado State University Department of Soil and Crop Sciences in 2008 with an appointment that includes research, teaching, and extension responsibilities. Prior to CSU, Jay led a program in micrometeorology and environmental physics for 18 years at Kansas State University. Jay's research includes: (1) evaluation of air and water quality issues at animal feeding operations; (2) micrometeorological studies of water, carbon, and energy transport between the surface and atmosphere; and (3) instrumentation development. His teaching responsibilities include micrometeorology and research proposal development.*

*Jay acts as lead investigator for several federally-funded research projects that focus on ammonia emissions from feedlots and dairies. This work includes the develop of management practices to reduce emissions from livestock operations and track atmospheric transport of ammonia along the Front Range, including nitrogen deposition in Rocky Mountain National Park. He has also conducted research in anaerobic lagoons used to store and treat waste at livestock operations. He has been a leader in developing methods for measuring seepage losses from lagoons and predicting the effects of leached nitrogen on groundwater quality. He has also developed methods for measurement of greenhouse gas emissions from feedlots and swine waste lagoons. Jay was recently awarded a new grant as part of the National Robotics Initiative (NSF and USDA) to develop air quality robotics for use at feedlots and dairies. Other research interests include the air quality impacts of hydraulic fracturing used in oil and gas exploration.*

# Mark Your Calendar!

October  
2014

Wed  
23

Thu  
24

**The 24th Annual  
South Platte Forum**



**Wednesday, Oct. 24, 3:00 p.m.**

## **The Way to Go: South Platte Roundtable Portfolio Tool**

**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*

To facilitate the discussion of future water supply scenarios, portfolios and strategies, the CWCB created Colorado's Water Supply Future Portfolio and Trade-Off Tool. Using this planning tool, the South Platte basin Roundtable can examine different combinations of strategies or "portfolios" for meeting the basins future municipal and industrial (M&I) water needs. This session will include an interactive overview of the planning tool and a portfolio prospective from each of the tradeoff sectors—Agriculture (Jim Yahn), Municipal (Harold Evans), and Non-consumptive (Bob Streeter).

*Sean is the executive director for the St. Vrain and Left Hand Water Conservancy District. He has more than 17 years of 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 Basin Roundtable, the management team of Colorado Water 2012, and the IBCC's Public Education Participation and Outreach workgroup, 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 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.*

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## Agriculture

Jim Yahn

IBCC Representative, South Platte Basin Roundtable, P.O. Box 103, Sterling, CO 80751, 970-522-2025, jim@northsterling.org, www.northsterling.org

Jim Yahn is the manager of the North Sterling and Prewitt reservoirs, a position that he has held for more than 20 years. He is responsible for overseeing the diversion and distribution of water to more than 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 that 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 is the past chairman of the South Platte Roundtable and currently serves as the roundtable's representative to the Interbasin Compact Committee. In his spare time Jim farms and ranches with his wife Tracy and their two children, preaches part time for Cowboy Up Ministries, and enjoys singing with a contemporary Christian band.

# South Platte Roundtable

## WHICH RIVER BASIN ARE YOU IN?

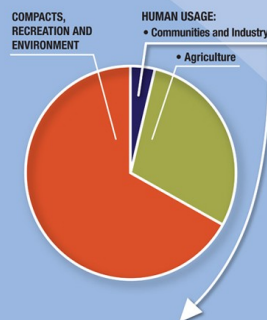
**BASIN:** an area of land where snowmelt and rainfall collect and drain into a common body of water, such as a river. There are 8 major river basins in Colorado, plus the Metro area.

### Water use in Colorado

THE TOTAL VOLUME OF ANNUAL WATER USAGE IN COLORADO IS 15 MILLION ACRE FEET.\*

1/3 OF THAT WATER is available for human use in Colorado. Of that, 10% is used for communities and industry while nearly 90% supports our food supplies (agriculture).

THE REMAINING 2/3 stays in the rivers, which benefits recreation and the environment and meets compact obligations with downstream states.

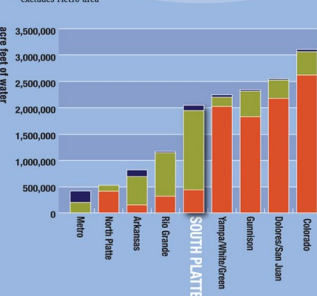


How much water is needed for our communities and industries?



### Water use by river basin

South Platte River Basin:  
Current Population: 977,000\*\*  
Estimated 2050 Population: 1,902,000\*\*



## Tradeoffs need to balance all water uses.

As our population increases and communities grow, the demand for water also goes up. Some look to Colorado's farms and ranches as a future water supply. However, taking water off agricultural lands and out of rivers may have adverse impacts related to our food supply, economic health, quality of life and the environment. Balancing water use so communities, agriculture and rivers have a sufficient water supply will determine our future.



## Stakeholders work together—this means you!

Filling **THE GAP** in water supply and demand will require a variety of solutions including:

- Water conservation and reuse
- Transferring water between communities and agriculture
- Development of new supplies and storage
- Moving currently planned projects forward

All the solutions will need to balance the risks to the environment, agriculture and recreation.



## Water is everybody's business!

Your perspective is important. Join other stakeholders interested in locally driven water solutions by attending the next South Platte Basin Roundtable meeting, held on the 2nd Tuesday every other month in Longmont.

To learn more, go to: <http://cwcb.state.co.us/water-management/basin-roundtables/Pages/main.aspx>



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## **Municipal**

### **Harold G. Evans**

*Weld County Municipal Representative, South Platte Roundtable, 1821 Frontier Rd., Greeley, CO 80634, 970-330-1828, harold@evansmanagement.com*

*Harold Evans is the owner of the Evans Group, LLC, a construction management consulting firm. He is vice chairman of the South Platte Roundtable and the Weld County municipal representative to the Roundtable. Harold has been a member of the Roundtable since the beginning of the process. He is chairman of the City of Greeley Water and Sewer Board and a sixteen-year member of this board. Other regional and statewide water activities Harold has been involved in have included Statewide Water Supply Initiative (SWSI) Technical Roundtable membership for both SWSI One and SWSI Two studies. In 2007 Harold was a member of the Governor Ritter South Platte River Task Force looking at the issue of tributary ground water in the South Platte. His education includes bachelor's and master's degrees in civil engineering from the University of Missouri. Harold is a licensed Professional Engineer in Colorado and Missouri.*

## **Environmental**

### **Robert (Bob) G. Streeter**

*Environmental Representative, South Platte Roundtable, 929 Coho Run, Fort Collins, CO 80524, 970-495-1893, rgstreeter@gmail.com*

*Bob Streeter is a wetlands and native prairie consultant in Fort Collins, Colorado. He is retired from the U.S. Fish and Wildlife Service and has served on the Colorado Parks and Wildlife Commission and the Larimer County Open Lands Board. He has worked on Trout Unlimited and riparian restoration projects as a viticulturist.*

*Bob's work experience includes farming in South Dakota, researching for the Game and Fish Departments in South Dakota and Colorado, and researching for the U.S. Air Force aerospace programs. With the U.S. Fish and Wildlife Service he has held many positions: research scientist, manager, and information transfer leader. He was involved with the North American Waterfowl Management Plan and North American Wetlands Conservation Act program. He served as assistant director of Refuges and Wildlife and was the Mexico and Latin American coordinator for Ducks Unlimited, Inc.*

*Bob received his bachelor's degree in zoology from South Dakota State University, his master's degree in wildlife ecology from Virginia Polytechnic Institute and State University, and his doctorate degree in physiology, nutrition, and ecology from Colorado State University.*



Wednesday, Oct. 24, 4:00 p.m.

## **The Business Ways of Water**

Presented by the Colorado Water Innovation Network  
Moderator: Reagan Waskom, Colorado Water Institute

### **Brian Ashe**

Chairman, CWIC; Business Manager, Riverside Technologies, 2950 E. Harmony Rd, Ste. 390, Fort Collins, CO 80528, [brian.ashe@riverside.com](mailto:brian.ashe@riverside.com)

*Brian Ashe is the manager of business development at Riverside Technology, inc., a global water resources engineering company specializing in the development of water management decision support systems. Brian is responsible for business development, marketing operations, and client development strategies. In his role at Riverside, Brian works with clients across the country developing solutions that address water management problems including water supply and climate change vulnerabilities. He has been involved in developing the technical objectives and market strategies for the Riverside Climate Change Decision Support System, a web-based tool which provides water providers stream flow predictions under varying future climate scenarios.*

*Brian's background includes market strategy development for global technology firms and the expansion of strategic partnerships in both information technology and environmental markets. Brian graduated from Cornell University with a bachelor's degree in business management and marketing and is currently completing his master's degree in environmental policy and management from the University of Denver.*

### **Stephen Smith**

Partner, Regenes Management Group, 8204 S. CR 3, Fort Collins, CO 80528, 303-777-4000 x117, [swsmith@regenmg.com](mailto:swsmith@regenmg.com), [www.regenesismg.com](http://www.regenesismg.com)

*Stephen W. Smith, PhD, is a founding partner of Regenes Management Group, a high technology water resources and irrigation management firm. He founded Aqua Engineering, Inc. in 1975 and taught irrigation design classes at Colorado State University for 20 years. His engineering experience includes projects throughout the United States and more than a dozen foreign countries. Stephen is past national president of both the American Society of Irrigation Consultants and the Irrigation Association. He is a board member with the Colorado Water Innovation Cluster. He serves on the Board of the Loudon Irrigating Canal & Reservoir Co. and farms under this 120-year-old canal system in northeastern Colorado.*



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**Josh Birks**

Economic Health Director, City of Fort Collins, 300 LaPorte Ave., Fort Collins, CO 80524, 970-221-6324, jbirks@fcgov.com

*Josh Birks is an experienced economic development professional currently working as the City of Fort Collins Economic Health Director. In this role, he applies a broad base of experience and education in real estate, public finance, and economic development to ensure a vibrant Fort Collins economy.*

*Josh graduated from the University of Denver with a bachelor's degree in political science. He received his master's degree in urban and regional planning and his graduate certificate in real estate development from Portland State University.*

*Josh's background includes cluster formation and support, business expansion, and relocation assistance. Due to his work on numerous real estate projects, he has experience in extensive feasibility and market analysis. Josh has worked for clients and employers in both the public and private sector, and as a result, can translate between the two to facilitate strategic public/private partnership negotiation.*

**Wednesday, Oct. 24, 5:00 - 7:00 p.m.**

**Colorado Water Congress POND Reception**

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**See you tomorrow...**

We'll start again Thursday morning promptly at 8:30 a.m.  
A continental breakfast will be available at 8:00 a.m.



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**Thursday, Oct. 25, 8:30 a.m.**

## **Finding a Way: Oil and Water**

### **Moderator: Kate Fay**

Senior Advisor, Energy and Climate, Office of the Regional Administrator, U.S. EPA Region 8, 1595 Wynkoop St., Denver, CO 80202, 303-312-6432, [fay.kate@epa.gov](mailto:fay.kate@epa.gov)

*Kate Fay is a nationally known expert in environmental and energy policy development and implementation. In February 2011 Kate was appointed to serve as EPA Region 8 Senior Advisor for Energy and Climate, reporting to the Regional Administrator and assisting him in all aspects of the region's energy and climate-related work. For the preceding four years, Kate was energy manager for the Colorado Department of Public Health and Environment where she led the department's participation in the statutorily mandated overhaul of the Colorado Oil and Gas Commission regulations and their subsequent implementation.*

*Kate has also been president of Terra Firma Strategies, a consulting resource to the energy industry for environmental and energy planning and analysis. In the late 1980s and early 1990s, Kate held two positions at the U.S. Environmental Protection Agency in Washington, D.C., including policy advisor to the assistant administrator for Air and Radiation and senior analyst in the Office of Policy Analysis and Review, where she worked exclusively on reauthorization of the Clean Air Act and the Act's implementing regulations. Kate began her career in California working in the environmental department of Tosco Corporation, an energy developer, and at Sierra Research, a consulting firm specializing in air quality policy and analysis. Kate holds degrees from the University of California, Berkeley in natural resources economics and public policy.*

## **Moving Beyond Misinformation: Education and Engagement**

### **Sarah Landry**

Community Outreach Coordinator, Colorado Oil & Gas Association, 1660 Lincoln St., Ste. 2710, Denver, CO 80264, 303-861-0362, [Sarah@coga.org](mailto:Sarah@coga.org)

This presentation will take the audience through the common myths about the oil and gas industry with a focus on water. From concerns about water contamination to water use, the goal of this presentation is to offer science-based information about Colorado's oil and gas industry. Hydraulic fracturing and our state's regulations will be examined to bring light to a topic that is often misrepresented.

*Sarah Landry serves as the community outreach coordinator for the Colorado Oil & Gas Association. Through this position Sarah strives to foster open dialogue and positive relationships between Colorado's local communities and the oil and gas industry. Born and raised in Baton Rouge, Louisiana, she previously handled communications and outreach in Governor Bobby Jindal's office, including assisting with the Deepwater Horizon oil spill response efforts. She received her bachelor's degree from the University of Colorado, Boulder.*

## **Managing the Benefits and Impacts of Oil, Gas and Water – A County Government Perspective**

### **Douglas Rademacher**

Weld County Commissioner, P.O. Box 758, Greeley, CO 80632-0758, 970-336-7204, [drademacher@co.weld.co.us](mailto:drademacher@co.weld.co.us), [www.co.weld.co.us](http://www.co.weld.co.us)

Weld County has a long history of working with the oil and gas industry; there are more oil and gas wells in Weld County than another other county in Colorado. Weld County Commissioner Douglas Rademacher will discuss the benefits and impacts of the oil and gas industry in the county and how the county has worked with the industry throughout the years on issues ranging from roads to water.

*Douglas Rademacher is a fourth-generation farmer and rancher from southern Weld County. He is currently serving in his second term as a Weld County Commissioner representing District 2. Doug's community involvement includes serving on numerous water boards, fair boards, the Weld County Council, the America Pride Coop, and the Saint Vrain Sugar Beet Association. Doug also served his community as a volunteer firefighter for 24 years before retiring as a Battalion Chief managing three volunteer stations. He is married to his wife, Jane, and together they have three children and two grandchildren.*



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## **Addressing Water and Community Impacts from Oil and Gas Development**

### **Laura Belanger**

*Water Resources and Environmental Engineer, Western Resource Advocates, 2260 Baseline Rd., Ste. 200, Boulder, CO 80302, 720-763-3718, laura@westernresources.org, www.westernresources.org*

Increased oil and gas development, much in the South Platte Basin and in close proximity to populated areas, is raising questions about energy's water demands and potential water quality impacts, among other issues. Laura will discuss the water needed for new well development and why better data collection and planning are needed to understand and balance energy's needs with other uses. She will also discuss water quality and other concerns, what the state and industry are doing to address these, and additional protections that could be implemented.

*Laura Belanger is a water resources engineer with Western Resource Advocates (WRA), a non-profit organization that works to protect the West's land, air, and water. She is the lead author of WRA's recently released Fracking our Future report. Laura is a licensed professional engineer in Colorado. Previously she was a consultant, most recently with Headwaters Corporation where she worked on the Platte River Recovery Implementation Program. Laura holds a Master of Science in civil engineering from the University of Colorado.*

## **Is Water Management the Key to Environmentally Acceptable Shale Oil and Gas Production?**

### **Ken Carlson**

*Co-Director, Colorado Energy Water Consortium; Associate Professor, Colorado State University, Department of Civil and Environmental Engineering, Fort Collins, CO 80523, 970-988-0763, kcarlson@engr.colostate.edu, <http://cewc.colostate.edu>*

*Ken Carlson is an associate professor in civil and environmental engineering at Colorado State University with more than 20 years of experience in water treatment, wastewater handling, and environmental engineering. Ken is the director of the Colorado Energy Water Consortium, a public-private partnership that is addressing water issues associated with oil and gas exploration and production in Colorado and the Rocky Mountain region. Through the consortium, Ken is working with industry, the Colorado Oil and Gas Association, and the National Renewable Energy Lab on water quantity characterization and frac flowback/produced water quality assessment. Ken has been instrumental in organizing the Colorado State University Natural Gas Symposium in 2011 and 2012. Ken has a bachelor's degree in chemical engineering from the University of Wisconsin, a master's degree in civil engineering from Colorado State University, and a doctorate in environmental engineering from the University of Colorado – Boulder. Before coming to Colorado State University, Ken worked for more than a decade in private industry including multiple positions in the environmental consulting field.*

**Thanks for coming to the South Platte Forum...**

**...Don't forget to fill out your evaluation!!**



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Thursday, Oct. 25, 10:45 a.m.

## **Climate: Way More than Weather**

**Moderator: Rich Vidmar**

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.*

### **Another Crazy Year in Colorado—Where Does 2012 Fit in the Bigger "Climate" Picture?**

**Nolan Doesken**

Colorado State Climatologist and Senior Research Associate, Colorado Climate Center, Dept. of Atmospheric Science, 1371 Campus Delivery, Colorado State University, Fort Collins, CO 80523-1371, 970-491-3690, nolan@atmos.colostate.edu

### **We've Been Here Before: A Multi-Century Tree-Ring Perspective on Drought in the South Platte Basin**

**Jeff Lukas**

Western Water Assessment, CIRES, University of Colorado, NOAA ESRL PSD, 325 Broadway, Boulder, CO 80305, 303-497-6212, Lukas@Colorado.EDU, [treeflow.info/platte/index.html](http://treeflow.info/platte/index.html)

The severe drought conditions and very low streamflows in the South Platte and across Colorado in 2012, so closely following the extreme drought year of 2002, raises questions about the unusualness of the climate of the past decade. While gaged flow records and observed climate records, both going back to the late 1800s, can help answer these questions, a much richer context is provided by the multi-century tree-ring record. The annual growth of moisture-sensitive conifers—ponderosa pine, Douglas-fir, and pinyon pine—closely tracks the relative wetness or dryness of that water year. We have used such trees to reconstruct annual (water-year) streamflow in the South Platte basin, at nine gage locations, back as far as the mid-1500s. These reconstructions indicate that while 2002 was indeed an extreme event, the sequence of years in the early 21st century is not outside of the range of the previous 400 years. The tree-ring reconstructions also show multi-year drought events prior to 1900 that were more persistent and severe than any since 1900. These tree-ring reconstructed flow records are available through the TreeFlow web resource: <http://treeflow.info>.

*Jeff Lukas is senior research associate with the Western Water Assessment, a research program of the University of Colorado chartered and base-funded by NOAA. Jeff's research over the last decade has centered on the use of multi-century tree-ring records to assess past climatic and hydrologic variability in Colorado and the interior West. He has worked with water resource managers at the local, state, and federal levels to develop tree-ring reconstructions of annual streamflow and use them in modeling and planning (see the TreeFlow web resource: [treeflow.info](http://treeflow.info).) His current position with the Western Water Assessment carries a broad mandate to help resource managers to more effectively incorporate climate information at all time scales—paleoclimate, historic records, forecasts, and climate projections—into their planning and operations. Jeff has degrees in geography and forestry from the University of Colorado and University of Montana, respectively.*





## **Implications of Climate Change for Grasslands and Riparian Areas in the Western Great Plains**

**Jack A. Morgan**

Research Plant Physiologist, Rangeland Resources Research Unit; USDA-Agricultural Research Service, Crops Research Lab, 1701 Centre Ave., Fort Collins, CO 80526, 970-492-7121, jack.morgan@ars.usda.gov, <http://www.ars.usda.gov/pandp/people/people.htm?personid=3960>

Jack Morgan is a plant physiologist with the USDA-Agricultural Research Service. Upon completion of a doctorate in agronomy/plant physiology from the University of Georgia in 1981, Jack came to Fort Collins to work for ARS, first in research investigating drought resistance in crop species, and for the last 16 years evaluating how Great Plains rangelands respond to climate change. He has contributed to national and international climate change assessment efforts, including reports issued by the U.S. Global Change Research Program and the Intergovernmental Panel on Climate Change. In 2010 he was the recipient of the Colorado Governor's Award for High Impact Research in Climate Change.

**Want to take another look at the PowerPoint Presentations?  
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Thursday, Oct. 25, 12:00 p.m.

## **Keynote Luncheon**

**Sponsored by: Deere & Ault Consultants, Platte River Recovery Implementation Plan, Colorado Corn, Regensis Management Group, Consortium for Research and Education on Emerging Contaminants, and South Platte Roundtable**

### **Ten Years of Climate Science and Sustainability: How Should We Deal with Uncertainty?**

**Brad Udall**

*Director, CU-NOAA Western Water Assessment, NOAA Earth System Research Laboratory, 325 Broadway, Boulder, CO, 80305, 303-497-4573, bradley.udall@colorado.edu*

Since 1980 Colorado has warmed by 2F, and by 2050 Colorado will undergo 4F more warming. Over the last ten years the water community has actively engaged with climate scientists to understand all aspects of our changing climate from paleoclimate studies to downscaled global climate model simulations. At the same time an extended national, regional, and state dialogue has been underway to envision a sustainable water future. What lessons have we learned from these interactions in Colorado and elsewhere? What lessons have we ignored? What are we missing as we grapple with uncertain science?

*Bradley H. Udall is the director of the University of Colorado Western Water Assessment, one of 11 NOAA-funded RISA programs. He is also a co-principal investigator for two Department of Interior Climate Science Centers—the Southwest and North Central regions. As a member of the research faculty at the University of Colorado, Brad's expertise includes hydrology and related policy issues of the American West. Brad has written extensively on the impacts of climate change on water resources including U.S. Global Change Research Program reports. He is a contributing author and expert reviewer for the Intergovernmental Panel on Climate Change and has provided testimony for the U.S. Congress. Brad recently spent four months as a visiting scholar in South Australia at the state's Department for Water. His latest project is a book on how Australian water reforms might be applied to the United States.*



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## **Poster Abstracts**

### **Identification of Spatial and Topographical Metrics for Micro Hydropower Applications in Irrigation Infrastructure**

**Brian Campbell**

*M.S. Candidate, bcamp@lamar.colostate.edu*

**Dan Zimmerle, Dr. Kimberly Catton**

*dan.zimmerle@colostate.edu, kimberly.catton@colostate.edu*

A recent agreement between the Federal Energy Regulatory Commission and the State of Colorado seeks to streamline regulatory review of small, low-head hydropower (micro hydropower) projects located in constrained waterways, *Memorandum of Understanding Between The Federal Energy Regulatory Commission and The State of Colorado Through the Governor's Energy Office to Streamline and Simplify the Authorization of Small Scale Hydropower Projects*, 2010. This regulatory change will likely encourage the development of micro hydropower projects, primarily as upgrades to existing infrastructure. Previous work has used various methodologies to estimate that the combined capacity of micro hydro projects in Colorado varies between 664 MW to 5,003 MW, *Connor, A.M., et al. 1998, Hall, D.G., et al. 2004, 2006*. Of the methodologies used to identify capacity and quantity of micro hydropower projects, upgrades of existing hydraulic structures in irrigation canals are not represented.

A previous Colorado Department of Agriculture study, *Applegate Group, 2011*, identified existing upgradeable infrastructure categories for low head hydropower development in irrigation systems, including diversion structures, line chutes, vertical drops, pipelines, check structures and reservoir outlets. However, that study did not estimate a quantity of each category, confirm available hydropower capacity, or identify the most dominant type of structure.

The current study represents the first step in a comprehensive field study to quantify the type and quantity of irrigation infrastructure for potential upgrade to support micro hydropower production. Field surveys were conducted at approximately 230 sites in six of Colorado's seven hydrographic divisions at existing hydraulic control structures. The United States Bureau of Reclamation contributed approximately 330 additional sample sites from the 17 western states. The work presented here describes a novel method of identifying geospatial metrics to support an estimation of total site count and resource availability of potential micro hydropower. The proposed technique is general in nature and could be utilized to assess micro hydropower resources in any region.

### **The Consortium for Research and Education on Emerging Contaminants (CREEC): Fostering Interdisciplinary Research, Collaboration, and Communication**

**Barbara Bennett**

*Surface Water Assessor, Colorado Department of Public Health and Environment, 4300 Cherry Creek Dr. South, Denver, CO 80246, 303-692-3577, barbara.bennett@state.co.us*

**William A. Battaglin, Ken Clark**

The Consortium for Research and Education on Emerging Contaminants (CREEC) is a non-profit organization comprised of scientists, educators, engineers, and other stakeholders with a shared interest in the source, fate, and physiological effects of contaminants of emerging concern (CECs). CREEC's goals include: advancing the state of knowledge of the occurrence, fate, transport, ecological and public health implications of CECs; providing a forum to educate and share information on CECs in an open and unbiased way; linking researchers with diverse backgrounds with opportunities for conducting complex investigations; and providing practical solutions to CEC-related problems.

CREEC is accomplishing its goals by holding quarterly meetings and an annual workshop. The meetings and workshop provide an opportunity for CREEC members and the general public to hear the latest research from world-class scientists. They also create opportunities for the regulated community to interact with potential regulators, and the scientific community to interact with the engineers and policy makers charged with solving CEC-related problems. CREEC also provides focused training for water and wastewater plant operators on the sources and chemistry of CECs, as well as the efficacies of different treatment processes for removing and transforming CECs. This sharing of information and ideas creates a dynamic situation that promotes community understanding about CEC-related issues, and provides momentum for citizens who are already working to reduce CECs in the environment through treatment, source control and public education.

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