

# **The Agriculture/Urban Water Interface — Conflicts and Opportunities**

**USCID Water Management Conference**

*Pre-Conference Workshop —  
Applications of Mobile Devices for Water Management*



**USCID**

*The U.S. society for irrigation and drainage professionals*

*Cooperating Organization —  
Rocky Mountain Section  
American Society of Agricultural and Biological Engineers*

**October 22-25, 2013  
Denver, Colorado**

## Program

### Monday, October 21

12:00 noon - 1:00 p.m. **Registration**

1:00 p.m. - 5:30 p.m. **Workshop on Applications of Mobile Devices for Water Management**

*Mobile Irrigation Water Management System for Colorado*

**Andrew Bartlett**, **Allan A. Andales**, **Mazdak Arabi** and **Troy A. Bauder**, Colorado State University, Fort Collins, CO

*Affordable Web-Based Mobile Applications for Remote Data Viewing using HEC-DSSVue*

**Chuck Davis** and **Brian T. Wahlin**, WEST Consultants, Inc., Tempe, AZ

*Canal Flow Measurement Mobile Application*

**Bryan J. Heiner**, Bureau of Reclamation, Denver, CO

### Tuesday, October 22

7:00 a.m. - 5:30 p.m. **Registration**

8:00 a.m. - 11:30 a.m. **Field Tour**

Hydraulics Laboratory, Bureau of Reclamation

12:00 noon - 1:15 p.m. **Lunch with Speaker**

Moderator — **Bryan P. Thoreson**, President, USCID and Davids Engineering, Inc., Davis, CA

Speaker — **Gregory J. Hobbs**, Justice, Colorado Supreme Court, Denver, CO

1:30 p.m. - 3:00 p.m. **Plenary Session I**

Moderator — **Luis A. Garcia**, Conference Co-Chairman and Colorado State University, Fort Collins, CO

*Keynote Address*

**Mark A. Limbaugh**, The Ferguson Group, Washington, DC

*Colorado River Water Bank Feasibility Study*

**Dan Birch**, Colorado River Water Conservation District, Glenwood Springs, CO; and **Chip Paulson**, MWH, Denver, CO

*Colorado River Basin Supply and Demand Study — Integrated, Long-Term Planning in the Face of Uncertainty*

**Armin Munévarm**, CH2M Hill, San Diego, CA; **Greg Gates**, CH2M Hill, Albuquerque, NM; **Les Lampe**, Black & Veatch Corporation, Overland Hills, KS; **Klint Reedy**, Black & Veatch Corporation, Centennial, CO; and **Carly Jerla** and **Jim Prairie**, Bureau of Reclamation, Boulder, CO

3:00 p.m. - 3:30 p.m. **Break**

3:30 p.m. - 5:00 p.m. **Panel Discussion — Water User Perspectives of the Colorado River Basin Study**

Moderator — **Gerald A. Gibbens**, Conference Co-Chairman and Northern Water, Berthoud, CO

**Chuck Cullom**, Salt River Project, Phoenix, AZ

**Tage I. Flint**, Weber Basin Water District, Layton, UT

**Tina Shields**, Imperial Irrigation District, Imperial, CA

**Kerry Sundeen**, Front Range Water Council/Grand River Consulting, Glenwood Springs, CO

5:00 p.m. - 5:30 p.m. **Meet the Exhibitors**

5:30 p.m. - 7:30 p.m. **Networking Reception and Exhibition**

### Wednesday, October 23

7:00 a.m. - 5:30 p.m. **Registration**

7:00 a.m. - 8:00 a.m. **Continental Breakfast in Exhibit Hall**

8:00 a.m. - 9:30 a.m. **Panel Discussion — State Water Issues**

Moderator — **Thomas W. Ley**, Colorado Division of Water Resources, Pueblo, CO

**Mike Sullivan**, Colorado Division of Water Resources, Denver, CO

**Steve Wolff**, Office of Wyoming State Engineer, Cheyenne, WY

Additional Panel Members to be announced

9:30 a.m. - 10:30 p.m. **Break in Exhibit Hall**

10:30 a.m. - 12:00 noon **Plenary Session II**

*Water Management in the Jordan Valley: Water Transfers and Institutional Reform*

**Mark Svendsen**, Engility, Philomath, OR; **Akram Rabadi**, Engility; and **Qais Oweis**, Jordan Valley Authority, Amman, Jordan

*Alternative Water Transfer Strategies: Issues and Lease Rate Impacts*

**Stephen W. Smith**, Regenesys Management Group, Fort Collins, CO

*Super Ditch on the Arkansas River*

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12:00 noon - 1:15 p.m. **Buffet Lunch in Exhibit Hall**

1:30 p.m. - 3:00 p.m. **Concurrent Session 1A — Technology and Decision Support**

Moderators — **Amy Johnson**, Northern Water, Berthoud, CO; and **Darell D. Zimelman**, Water Systems Operations & Management, Windsor, CO

*Updated Metergate Calibration Testing for Farm Turnout Delivery*

**Daniel Howes**, California Polytechnic State University, San Luis Obispo, CA

*Using WinGate to Develop Practical Discharge Equations for Gated Outlets at Yellowtail Afterbay Dam*

**Tony Wahl**, Bureau of Reclamation, Denver, CO

*Matlab/Simulink Nonlinear Hydraulic Models for Testing Canal Control Gates*

**Blair L. Stringam**, New Mexico State University, Las Cruces, NM

1:30 p.m. - 3:00 p.m. **Concurrent Session 1B — Sharing Water; Solving Conflicts**

Moderators — **Thomas J. Trout**, USDA-ARS, Fort Collins, CO; and **Reed R. Murray**, U.S. Department of the Interior, Provo, UT

*Water Settlements Involving Agriculture and Urban Water Users — An Engineer's Perspective*

**L. Niel Allen**, Utah State University, Logan, UT

*Urbanization Conflicts for Irrigation Districts*

**Laura A. Schroeder**, Schroeder Law Offices, P.C., Portland, OR

*Methods Used by Bureau of Reclamation Economists to Estimate Irrigation Benefits When Water Supply Changes Occur*

**Rob Davis**, Bureau of Reclamation, Denver, CO

3:00 p.m. - 3:30 p.m. **Break in Exhibit Hall**

3:30 p.m. - 5:30 p.m. **Concurrent Session 1A — Technology and Decision Support (continued)**

*Canal Modernization, Measurement, and Remote Monitoring to Manage District-Wide Water Use Efficiency and Effectiveness*

**Matthew Zidar**, GEI Consultants, Inc., Rancho Cordova, CA; **Samuel Schaefer**, GEI Consultants, Inc., Santa Barbara, CA; and **Lupe Chavez**, Consolidated Irrigation District, Selma, CA

*A Critical Analysis of the EPA WaterSense® WBIC Program*

**Michael Davidson**, Davidson Consultants, Altadena, CA

*Conjunctive Use of Effective Irrigation Canal Operation with Hydrokinetic Power Generation Technology. Is it Possible?*

**Josh Mortensen**, Bureau of Reclamation, Denver, CO

*Drainage Application of Rapid Continuous Insitu Hydraulic Conductivity Testing*

**Todd Gason**, Bureau of Reclamation, Denver, CO

3:30 p.m. - 5:30 p.m. **Concurrent Session 1B — Sharing Water; Solving Conflicts (continued)**

*Republican River Compact Issues*

**Richard A. Westmore**, GEI Consultants, Inc., Denver, CO

*How Has Conjunctive Use Changed in the South Platte River Basin Over 50 Years*

**Robert A. Longenbaugh**, Retired Consultant Water Engineer, Fort Collins, CO

*Utilization of the South Platte Tributary Aquifer: Returnflow Hydrology and River Augmentation in Colorado*

**Jon Altenhofen**, Northern Colorado Water Conservancy District, Berthoud, CO

*Water Conservation Using Partial Root Drying for Drip Irrigated Chile*

**H. Sharma**, **S. K. Deb** and **M. K. Shukla**, New Mexico State University, Las Cruces, NM

6:30 p.m. - 7:00 p.m. **Reception**

7:00 p.m. - 9:30 p.m. **Dinner with Speaker**

Moderator — **Bryan P. Thoreson**

Speaker — **Lowell Catlett**, New Mexico State University, Las Cruces, NM (Invited)

**Thursday, October 24**

7:00 a.m. - 5:00 p.m. **Registration**

7:00 a.m. - 8:00 a.m. **Continental Breakfast and Poster Session**

*Evaluation of the Performance of Smallholder Pumped Irrigation Systems, in Arid Areas of Saudi Arabia*

**Abdullah S. Aljughaiman**, King Faisal University, Alhassa, Saudi Arabia

*Effect of Drought on the Growth and Yield of Three Flax (*Linum usitatissimum*,L.) Varieties*

**Sami Althabet**, King Faisal University, Alhassa, Saudi Arabia

*Self-Cleaning Trash Rack for Irrigation Canals*

**Thomas W. Gill**, Bureau of Reclamation, Denver, CO

*Water Level Sensors, What Works?*

**Bryan J. Heiner** and **Thomas W. Gill**, Bureau of Reclamation, Denver, CO

*Environmental Discourses in Borana Oromo: A Focus on Narratives*

**Teshome Tafesse**, Addis Ababa University, Addis Ababa, Ethiopia

*Distributed Water Consumption and Irrigation/Efficiency at Palo Verde Irrigation District*

**Saleh Taghvaeian**, Colorado State University, Fort Collins, CO

**8:00 a.m. - 10:00 a.m. Concurrent Session 2A — Remote Sensing/Evapotranspiration**

Moderators — **Kendall DeJonge**, USDA-ARS, Fort Collins, CO; and **Saleh Taghvaeian**, Colorado State University, Fort Collins, CO

*Ground-Based Remote Sensing of Water-Stressed Crops: Thermal and Multispectral Imaging*

**Kendall DeJonge**, USDA-ARS, Fort Collins, CO; and **Saleh Taghvaeian**, Colorado State University, Fort Collins, CO

*Crop Coefficients Using Remote Sensing*

**Luis A. Garcia**, Colorado State University, Fort Collins, CO

*Mapping Turf Evapotranspiration with High-Resolution Multispectral Aerial Imagery and METRIC*

**M. J. Hattendorf** and **M. Crookston**, Northern Colorado Water Conservancy District, Berthoud, CO

*Remote Sensing of Irrigation Requirements in Wine Grapes*

**Martin Mendez-Costabel**, **Nick Dokoozlian** and **Andrew Morgan**, EJ Gallo Winery, Modesto, CA; and **Bryan Thoreson** and **Byron Clark**, Davids Engineering, SEBAL North America, Davis, CA

**8:00 a.m. - 10:00 a.m. Concurrent Session 2B — Management Improvements**

Moderators — **Tony Wahl**, Bureau of Reclamation, Denver, CO; and **Samuel W. Schaefer**, GEI Consultants, Inc., Santa Barbara, CA

*Benefits of the South San Joaquin Irrigation District's Pilot Pressure Irrigation Project*

**Jeff Shaw** and **Todd Kotey**, Stantec Consulting, Inc., Rocklin, CA

*Effect of Watercourses Lining on Water Distribution Equity: A Case Study from Sindh, Pakistan*

**Saleem Raza Samo**, Quaid-e-Awam University of Engineering, Science and Technology, Nawabshah, Sindh, Pakistan; and **Bakhshal Lashari**, Mehran University of Engineering and Technology, Jamshoro, Sindh, Pakistan

*Analysis of Participatory Irrigation Management in Sindh Province of Pakistan: Issues, Options and Way Forward*

**Fateh Muhammad Marri**, Government of Sindh, Sindh, Pakistan; **Bakhshal Lashari**, Mehran University of Engineering and Technology, Jamshoro, Sindh, Pakistan; and **Ghazala Chanar**, Water and Power Development Authority, Hyderabad, Pakistan

*Turning Challenge into Opportunity*

**Damien Pearson**, Rubicon Water, Fort Collins, CO

**10:00 a.m. - 10:30 a.m. Break with Poster Papers**

**10:30 a.m. - 12:00 noon Concurrent Session 2A — Remote Sensing/Evapotranspiration (continued)**

*Determining Corn Water Use with a Remote Sensing Based Within Canopy Air Temperature Method*

**José L. Chávez**, Colorado State University, Fort Collins, CO

*Modified Sebal Remote Sensing ET Algorithm to Account for Advection*

**Mcebisi M. Mkhwanazi**, and **José L. Chávez**, Colorado State University, Fort Collins, CO

*Effects of Surface Non-Uniformity on Penman-Monteith Equation*

**Abhinaya Subedi**, **José L. Chávez** and **Allan A. Andales**, Colorado State University, Fort Collins, CO

**10:30 a.m. - 12:00 noon Concurrent Session 2B — New Technology and Flow Measurement (continued)**

*Verifying Conservation Estimates for On-Farm Agricultural Water Conservation Programs*

**Ana Ramirez**, University of Texas at Austin, Austin, TX; and **Stacy Pandey**, Lower Colorado River Authority, Austin, TX

*Evaluation of the Glover Solution for Estimating Changes in Return Flow to the Arkansas River*

**Cale Mages**, **Ryan T. Bailey** and **Timothy K. Gates**, Colorado State University, Fort Collins, CO

*Effect of Water, Irrigation, Energy and Environmental Factors on Agricultural Productivity in Nigeria*

**A. A. Ezekiel** and **J. O. Oladebo**, Ladoke Akintola University of Technology, Ogbomosho, Oyo State, Nigeria

**12:00 noon - 1:15 p.m. Lunch with Speaker**

Moderator — **Bryan P. Thoreson**

Speaker — **Darrin Drollinger**, Executive Director, American Society of Agricultural and Biological Engineers

**1:30 p.m. - 3:00 p.m. Concurrent Session 3A — Water Supply & Climate Change**

Moderators — **Stephen W. Smith**, Regenesys Management Group, Fort Collins, CO; and **José L. Chávez**, Colorado State University, Fort Collins, CO

*Adaptation of Western U.S. Agriculture to Climate Change Induced Water Scarcity*

**Todd Gaston**, Bureau of Reclamation, Denver, CO

*Water Supply Forecasting for Irrigation Districts*

**Delbert M. Smith**, Bureau of Reclamation, Denver, CO

*Crop production impacts and possible adaptations to climate change in Colorado*

**Saseendran S. Anapalli**, **Lajpat R. Ahuja**, **Liwang Ma** and **Timothy R. Green**, USDA-ARS, Fort Collins, CO

**1:30 p.m. - 3:00 p.m. Concurrent Session 3B — Disaster Mitigation**

Moderators — **Blair L. Stringam**, New Mexico State University, Las Cruces, NM; and **David E. Bradshaw**, Imperial Irrigation District, Imperial, CA

*Lessons from Small Irrigation Dam Failures*

**Owen Kubit**, Provost & Pritchard Consulting Group, Clovis, CA

*Flood 2010 and Its Disastrous Effects in Sindh, Pakistan*  
**Bakhshal Lashari**, Mehran University of Engineering and Technology, Jamshoro, Sindh, Pakistan; **Ehsan-ul-Haque Leghari**, Sindh Irrigation and Drainage Authority, Sindh, Pakistan; and **Fateh M. Marri**, Government of Sindh, Sindh, Pakistan

*Wildfires and Forest Health — Colorado-Big Thompson Project*

**Gerald A. Gibbens** and **Amy Johnson**, Northern Water, Berthoud, CO; and **Brad Piehl**, J.W. Associates, Breckenridge, CO

1:30 p.m. - 3:00 p.m. **Annual Meeting, Rocky Mountain Section, ASABE**

3:00 p.m. - 3:30 p.m. **Break with Poster Papers**

3:30 p.m. - 5:30 p.m. **Concurrent Session 3A — Irrigation Requirements/Evapotranspiration**

Moderators — **Stephen W. Smith**, Regenesys Management Group, Fort Collins, CO; and **José L. Chávez**, Colorado State University, Fort Collins, CO

*Grass Referenced Based Vegetation Coefficients for Estimating Evapotranspiration for a Variety of Natural Vegetation*

**Daniel Howes** and **Mariana Pasquet**, California Polytechnic State University, San Luis Obispo, CA

*Estimating Consumptive Use with Deficit Irrigation*

**Tom Trout** and **Kendall DeJonge**, USDA-ARS, Fort Collins, CO

*Evaluation of Appropriate Urban Water Conservation Practices to Ensure Water Availability for Agricultural Production*

**Sybil Sharvelle** and **Larry Roesner**, Colorado State University, Fort Collins, CO

*Mobile Irrigation Scheduling System on eRAMS/CSIP*

**Allan A. Andales**, **Andrew Bartlett**, and **Mazdak Arabi**, Colorado State University, Fort Collins, CO

3:30 p.m. - 5:30 p.m. **Concurrent Session 3B — Water Quality**

Moderators — **Blair L. Stringam**, New Mexico State University, Las Cruces, NM; and **David E. Bradshaw**, Imperial Irrigation District, Imperial, CA

*Irrigation and Drainage Design of a Water Re-Use Area to Manage Drain Water on Part of Westland's Water District*

**Roger Burnett**, Bureau of Reclamation, Denver, CO

*Santa Maria Valley, Groundwater Assessment for Salt and Nutrient Workgroup*

**Samuel Schaefer**, GEI Consultants, Inc., Santa Barbara, CA

*Water Quality Relationships among CDOM, Physiochemical Parameters, and Nutrients in an Irrigation Canal System, Hidalgo County, Texas*

**Frank J. Dirrigl, Jr.**, **Tess Thomas** and **Itzel M. Torres**, University of Texas-Pan American, Edinburg, TX

*Influence of Irrigation Management Scenarios on Nitrate and Selenium Mass Loading to the Arkansas River, Colorado*  
**Ryan T. Bailey** and **Timothy K. Gates**, Colorado State University, Fort Collins, CO

**Friday, October 25**

8:00 a.m. - 5:00 p.m. **Field Tour**

The Tour will go to the Colorado Springs area to visit the U.S. Air Force Academy and the Garden of the Gods, returning to Denver via Denver Water's Cheesman Dam. Lunch will be included.

(Updated August 3, 2013)