## Hydrology Days 2005

### Conference Program

**AGU Hydrology Days 2005**  
March 7 - March 9, 2005  
*Colorado State University*

### Program at a Glance

<table>
<thead>
<tr>
<th>March 7</th>
<th>March 8</th>
<th>March 9</th>
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</thead>
<tbody>
<tr>
<td>8 am - 6 pm</td>
<td>Posters</td>
<td>Posters</td>
</tr>
<tr>
<td>8 - 9:45 am</td>
<td><strong>River Restoration - Hydraulics</strong></td>
<td><strong>Remote Sensing - GIS</strong></td>
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<tr>
<td>9:45 - 10 am</td>
<td>Coffee break</td>
<td>Coffee break</td>
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<tr>
<td>10 - 12 am</td>
<td><strong>Landscape Evolution - Fluvial Geomorphology</strong></td>
<td><strong>Water Resources Management</strong></td>
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<tr>
<td>12 - 1:30 pm</td>
<td>Lunch</td>
<td><strong>Hydrology Days Award Lecture</strong></td>
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<tr>
<td>1:30 - 3:45 pm</td>
<td><strong>Fire and Hydrology</strong></td>
<td><strong>Hydrology Days Award Session I</strong></td>
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<tr>
<td>1:30 - 3:45 pm</td>
<td>Coffee break</td>
<td><strong>Irrigation</strong></td>
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<tr>
<td>3:45 - 4 pm</td>
<td><strong>Erosion - Sedimentation</strong></td>
<td><strong>Hydrology Days Award Session II</strong></td>
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<tr>
<td>4 - 6 pm</td>
<td>Coffee break</td>
<td><strong>Urban Hydrology</strong></td>
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<tr>
<td>4 - 6 pm</td>
<td><strong>Stochastic Approaches - Time Series Analysis</strong></td>
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### March 7

**March 7 8 AM**  
**River Restoration - Hydraulics**

**Chair:** Brian Bledsoe  
*Department of Civil Engineering, CSU*

**Cherokee Park Room - Lory Student Center**

8:00  
**A River Restoration Case Study: Three Forks of the Little Snake River, Colorado**

John Meyer and Brian P. Bledsoe  
*Department of Civil Engineering, Colorado State University, Fort Collins*

8:15  
**Mapping Stream Habitat Heterogeneity Using a Flexible Neighborhood Analysis Algorithm**

Keith D. Olson  
*Department of Forest, Rangeland, and Watershed Stewardship, Colorado State University, Fort Collins*  
Christopher O. Cuhaciyan and Brian P. Bledsoe  
*Department of Civil Engineering, Colorado State University, Fort Collins*
<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
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</thead>
<tbody>
<tr>
<td>8:30</td>
<td>A Probabilistic Approach for Assessing Effects of Deposited Fine Sediment on Aquatic Insects</td>
<td>Blair E. Hurst and Brian P. Bledsoe, Department of Civil Engineering, Fort Collins, CO 80523</td>
</tr>
<tr>
<td>8:45</td>
<td>Scale-dependent Relevance of Watershed, Valley, and Reach Descriptors to Benthic Indices Across Nested Ecoregions of the Pacific Northwest</td>
<td>Elaina R. Holburn and Brian P. Bledsoe, Department of Civil Engineering, Fort Collins, CO 80523, N. LeRoy Poff, Department of Biology, Fort Collins, CO 80523, Christopher O. Cuhaciyan, Department of Civil Engineering, Fort Collins, CO 80523</td>
</tr>
<tr>
<td>9:00</td>
<td>Multi-Scale Environmental Filters of Benthic Invertebrate Communities in Mountainous Ecoregions of Oregon and Washington</td>
<td>Christopher O. Cuhaciyan, Department of Civil Engineering, Fort Collins, Julian D. Olden, Center for Limnology, Madison, Wisconsin, Brian P. Bledsoe, Department of Civil Engineering, Fort Collins, N. LeRoy Poff, Department of Biology, Fort Collins, CO 80523</td>
</tr>
<tr>
<td>9:15</td>
<td>Effects of bendway weir characteristics on resulting eddy and channel flow conditions</td>
<td>Kristoph-Dietrich Kinzli, Civil Engineering Department, Fort Collins, Colorado 80523</td>
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<tr>
<td>9:30</td>
<td>The Effects of Bendway Weirs on Channel Flow Characteristics</td>
<td>Paul Schmidt, Civil Engineering Department, Fort Collins, CO 80523</td>
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<tr>
<td>9:45</td>
<td>Mid-morning coffee break</td>
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**March 7 10:00 Landscape Evolution - Fluvial Geomorphology**

**Chair: Pierre Julien**  
Department of Civil Engineering, CSU  
Cherokee Park Room - Lory Student Center

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<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
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<tbody>
<tr>
<td>10:00</td>
<td>New Challenges in the Modeling of Landscape Evolution</td>
<td>Gary Parker, St. Anthony Falls Laboratory, University of Minnesota, Twin Cities, MN</td>
</tr>
<tr>
<td>10:30</td>
<td>Computation of Wash Load in the Yellow River</td>
<td>Chih Ted Yang, Civil Engineering Department, Fort Collins, CO Francisco J. M. Simões, U.S. Geological Survey, P.O. Box 25046, Mail Stop 413, Lakewood, CO</td>
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<tr>
<td>Time</td>
<td>Session</td>
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<tr>
<td>10:45</td>
<td><strong>Impacts of Streamflow Production Mechanisms on the Evolution of River Basin Topography: The WE-38 Basin in Pennsylvania</strong></td>
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<td>Xiangjiang Huang</td>
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<td></td>
<td>Department of Civil and Environmental Engineering, Pennsylvania State University</td>
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<td>Jeffrey D. Niemann</td>
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<td></td>
<td>Department of Civil Engineering, Colorado State University</td>
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<tr>
<td>11:00</td>
<td><strong>Some influences of channel characteristics on sediment surface roughness in a cellular automata model.</strong></td>
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<td>Nancy E. Brown</td>
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<td></td>
<td>Department of Geosciences, Colorado State University, Fort Collins</td>
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<td></td>
<td>Jorge A. Ramirez</td>
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<td></td>
<td>Civil Engineering Department, Colorado State University, Fort Collins</td>
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<td>11:15</td>
<td><strong>Overview of Particle Size Trends of Gravel Bars on the Upper Rio Chagres, Panama</strong></td>
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<td>Francis Rengers</td>
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<td></td>
<td>Department of Geosciences, Colorado State University, Fort Collins</td>
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<td></td>
<td>Ellen Wohl</td>
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<td>Department of Geosciences, Colorado State University, Fort Collins</td>
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<tr>
<td>11:30</td>
<td><strong>Assessment of Land-Use Impacts on Forced-Pool Characteristics in Constriction-Dominated Channels</strong></td>
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<td>Jaime Goode and Ellen Wohl</td>
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<tr>
<td></td>
<td>Geosciences Department, Colorado State University, Fort Collins, CO</td>
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**March 7 12:00**  
**Lunch break**

**March 7 2:00**  
**Fire and Hydrology**

**Chair: Jose D Salas**  
Department of Civil Engineering, CSU

**Cherokee Park Room - Lory Student Center**

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<tr>
<th>Time</th>
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<tbody>
<tr>
<td>2:00</td>
<td><strong>Water and fire: wildfire forcing of hydrologic processes</strong></td>
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<td></td>
<td>Renzo Rosso</td>
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<td></td>
<td>Politecnico di Milano, Milan, Italy</td>
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<tr>
<td>2:30</td>
<td><strong>Post-fire Erosion at the Hillslope Scale in the Colorado Front Range: Rates and Controls</strong></td>
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<td></td>
<td>MacDonald, Lee H., and J. Pietraszak</td>
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<td></td>
<td>Watershed Science Program, Department of Forest, Rangeland, and Watershed Stewardship, Colorado State University, Fort Collins 80523</td>
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<tr>
<td>2:45</td>
<td>Effectiveness of BAER treatments in reducing post-fire erosion after the Hayman Fire, Colorado Front Range</td>
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<tr>
<td>3:00</td>
<td>Assessing the role of ground cover in post-fire runoff and erosion using simulated rainfall, Colorado Front Range</td>
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<tr>
<td>3:15</td>
<td>Predicting post-fire sediment production at the hillslope scale: Efforts to validate RUSLE and Disturbed WEPP in the Colorado Front Range</td>
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<tr>
<td>3:30</td>
<td>Optimization of a Post-Wildfire Hillslope Erosion Model</td>
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<tr>
<td>3:45</td>
<td>Mid-afternoon coffee break</td>
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**March 7**

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<tr>
<th>Time</th>
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<th>Authors</th>
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<tbody>
<tr>
<td>4:00</td>
<td>Erosion - Sedimentation</td>
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<tr>
<td>4:00</td>
<td>BORAMEP Total Load Analysis of the Low Flow Conveyance Channel on the Middle Rio Grande, New Mexico</td>
<td>Forrest Jay and Pierre Julien</td>
<td>Department of Civil Engineering, Colorado State University, Fort Collins, Colorado</td>
</tr>
<tr>
<td>4:15</td>
<td>Assessing reservoir sedimentation using bathymetric comparison and sediment loading measurements</td>
<td>Rathburn, S.L.</td>
<td>Department of Geosciences, Colorado State University</td>
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<td>Finley, J.B.</td>
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<td>Klein, S.M</td>
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<td>Department of Civil Engineering, Colorado State University, Fort Collins, CO 80523</td>
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<td>Whitman, B.R.</td>
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<td>Department of Geosciences, Colorado State University</td>
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<tr>
<td>4:30</td>
<td>Road Sediment Production and Delivery in the southern Sierra Nevada, California</td>
<td>Abby Korte and Lee H. MacDonald</td>
<td>Department of Forest, Rangeland, and Watershed Stewardship, Colorado State University</td>
</tr>
</tbody>
</table>
### Effects of Forest Thinning on Sediment Production and Soil Moisture in the Central Colorado Front Range

Ethan Brown and Lee MacDonald  
Department of Forest, Rangeland, and Watershed Stewardship, Colorado State University, Ft. Collins

### March 7 4:00  Stochastic Approaches - Time Series Analysis

**Chair: Jorge A Ramirez**  
Department of Civil Engineering, CSU

**Virginia Dale Room - Lory Student Center**

#### 4:00 Characterizing Droughts for the Colorado River System

Zeyad Tarawneh and José D Salas  
Department of Civil Engineering, Colorado State University, Fort Collins, CO

#### 4:15 Local Polynomial Method for Ensemble Forecast of Time Series

Satish Kumar Regonda and Balaji Rajagopalan  
Department of Civil Environmental and Architectural Engineering and CIRES, University of Colorado, Boulder, CO  
Upmanu Lall  
Department of Earth and Environmental Engineering, Columbia University, New York, NY  
Martyn Clark  
Cooperative Institute for Research in Environmental Sciences, University of Colorado, Boulder, CO  
Young-Il Moon  
Department of Civil Engineering, University of Seoul, Seoul, Korea

#### 4:30 Forecasting Annual Streamflows of Colorado Rivers Using Oceanic Climatic Variables

Chongjin Fu and José D Salas  
Department of Civil Engineering, Colorado State University, Fort Collins, CO

#### 4:45 Modeling and Simulation of Daily Precipitation

Tae-Sam Lee and José D Salas  
Department of Civil Engineering, Colorado State University, Fort Collins, CO

### 5:00 Raster-based Analysis and Visualization of Hydrologic Time-Series

Richard Koehler, Ph.D.  
National Oceanic and Atmospheric Administration, National Weather Service, Forecast Decision and Training Branch – COMET program, Boulder, CO.

### 5:15 Data Extension of Intermittent Streamflows for the Colorado River

Tae-Sam Lee and José D Salas  
Department of Civil Engineering, Colorado State University, Fort Collins, CO
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<td>Cherokee Park Room - Lory Student Center</td>
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</table>
| 1 | *Simulation Of Dispersion Of Pollutant By Eddy Field*  
Chagas, Patrícia and Souza, Raimundo  
Department of Environmental and Hydraulics Engineering, Federal University of Ceará, Fortaleza – CE – Brasil. |
| 2 | *Development of a Numeric Model, with Explicit Solution, to Study Flood Wave Propagation.*  
Chagas, Patrícia and Souza, Raimundo  
Department of Environmental and Hydraulics Engineering, Federal University of Ceará, Fortaleza – CE – Brasil. |
| 3 | *Study of the Depuration Capacity of a River, Considering the Propagation of a Dynamic Wave.*  
Chagas, Patrícia and Souza, Raimundo  
Department of Environmental and Hydraulics Engineering, Federal University of Ceará, Fortaleza – CE – Brasil. |
| 4 | *Solution of Saint Venant’s Equation to Study Flood in Rivers through Numerical Methods*  
Chagas, Patricia Chagas and Souza, Raimundo  
Department of Environmental and Hydraulics Engineering, Federal University of Ceará, Fortaleza – CE – Brasil. |
| 5 | *Geoelectric in Identifying Ground Water Quality*  
Hamid KAHPOOD and Jafar NAJIHAMMODI  
Water Resources Section, Civil Engineering Dept., Power Water Insitute of Technology, Tehran, Iran |
| 6 | *Groundwater artificial recharge: actuality, topics and geographical analysis*  
C. Miracapillo  
Fachhochschule beider Basel (FHBB), Basel (CH)  
G. Barbiero  
CNR Water Research Institute (IRSA), Rome (I) |
| 7 | *Erosion And Runoff Generation From Fire Disturbed Mediterranean Forest Area*  
Maria Cristina Rulli, Silvia Bozzi, Matteo Spada, Daniele Bocchiola, Renzo Rosso  
Department of Hydraulic, Environmental, Road and Surveying Engineering, Hydraulics, Fantoli Lab Building, Politecnico di Milano, Piazza Leonardo da Vinci, 32 I-20133 Milano MI Italy |
| 8 | *Exploring Relationships Between Geomorphic Factors and Wheat Yield Using Fuzzy Inference Systems*  
Dmitry Kurtener  
Agrophysical Institute, St. Petersburg, Russia  
Timothy R. Green  
USDA-ARS Great Plains Systems Research Unit, Fort Collins, CO  
Elena Krueger-Shvetsova  
Agrophysical Institute, St. Petersburg, Russia  
Robert H. Erskine  
USDA-ARS Great Plains Systems Research Unit |
| 9 | **A Review of Colorado Watershed Projects: Strategies for Implementation Planning and Stakeholder Involvement - In partnership with the Big Thompson Watershed Forum**  
Hilary N. Spitz  
Department of Forest, Rangeland & Watershed Stewardship; State University, Fort Collins |
| 10 | **Evaluating uncertainty of ground-water vulnerability predictions using Latin Hypercube sampling**  
Jason J. Gurdak  
Geology and Geological Engineering Department, Colorado School of Mines, Golden, CO  
U.S. Geological Survey, Colorado Water Science Center, Lakewood, CO  
Sharon L. Qi  
U.S. Geological Survey, Corvallis, OR  
John E. McCray  
Environmental Science and Engineering, Colorado School of Mines, Golden, CO |
| 11 | **Calibration and validation of a rainfall-runoff model simulating infiltration and saturation excess**  
Pasquale Versace, Beniamino Sirangelo and Daniela Bioni  
Dipartimento di Difesa del Suolo, Università della Calabria, Arcavacata di Rende (CS), Italy |
| 12 | **Framework for Prioritizing Regulated River Restoration**  
Marisa Escobar and Greg Pasternack  
Department of Land, Air, and Water Resources, University of California, Davis, C 95616 |
| 13 | **Experimental investigation of NAPL migration and source zone formation in saturated heterogeneous media**  
Fritjof Fagerlund  
Air- and Water Sciences, Department of Earth Sciences, Uppsala University, Uppsala, Sweden  
and Center for Experimental Study of Subsurface Environmental Processes (CESEP), Department of Environmental Science and Engineering, Colorado School of Mines, Golden, CO  
Tissa Illangasekare  
Center for Experimental Study of Subsurface Environmental Processes (CESEP), Department of Environmental Science and Engineering, Colorado School of Mines, Golden, Colorado  
Auli Niemi  
Air- and Water Sciences, Department of Earth Sciences, Uppsala University, Uppsala, Sweden |
| 14 | **Research in the Caspar Creek Experiment Watershed, Northern California**  
Dena Hicks  
Department of Forest, Rangeland, and Watershed Stewardship, Colorado State University  
USDA Forest Service: Pacific Southwest Forest and Range Experiment Station |
| 15 | **Variation of Downstream Channel Morphology in the Tropical Montane Streams of the Luquillo Mountains, Puerto Rico**  
Andrew Pike  
Department of Earth and Environmental Science, University of Pennsylvania, Philadelphia, PA  
F.N. Scatena  
Department of Earth and Environmental Science, University of Pennsylvania, Philadelphia, PA |
| 16 | **Stochastic Simulation of the Truckee River Flow System**  
Chonjin Fu and José D Salas  
Department of Civil Engineering, Colorado State University, Fort Collins, CO |
| 17 | **Modeling Complex Interactions of Overlapping River and Road Networks in a Changing Landscape**  
John Loomis, Melinda Laituri, Jorge A Ramírez, Kirk Sherrill, and Ellen Wohl  
Colorado State University  
Alan Covich  
University of Georgia  
Paul Box, Todd Crowl and Kaite Hein  
Utah State University  
Armando González-Cabán  
USDA Forest Service  
Elías Gutierrez and Luis Santiago  
University of Puerto Rico  
Andy Pike, Fred Scatena, and Dana Tomlin  
University of Pennsylvania |
| 18 | **Studies of salt diffusion process and fluxes from seabed sediments to freshwater of the Polder reservoir**  
Xilai Zheng, Zengwen Gao, Junwen Wu  
Department of Environmental Engineering, Institute of Environmental Science and Engineering, Ocean University of China |
| 19 | **Study on the flow of water through non-submerged vegetation**  
Nehal L  
Yan Zhong Ming  
<p>| 20 | <strong>The South Paltte Basin Hydrologic Observatory</strong> |</p>
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<thead>
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<th>Time</th>
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<tbody>
<tr>
<td>8:00</td>
<td><strong>Remote Sensing - GIS – Satellite Data</strong></td>
<td>Chair: Luis Garcia</td>
<td>Cherokee Park Room - Lory Student Center</td>
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<td><strong>Department of Civil Engineering, CSU</strong></td>
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<td>8:00</td>
<td><strong>Thresholds Matter: Issues of Topographic Grid Resolution</strong></td>
<td>S.R. Fassnacht and M.J. Laituri</td>
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<td>Watershed Sciences Program, FRWS, Colorado State University, Fort Collins, CO</td>
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<td>8:15</td>
<td><strong>Generating Land Cover Maps for Urban Areas Using Satellite Imagery and Aerial Photography</strong></td>
<td>Luis Garcia, Ayman Elhaddad, Elgaali Elgaali and Ahmed Eldeiry</td>
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<td>Civil Engineering Department, Colorado State University</td>
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<td>8:30</td>
<td><strong>Calculating ET Using Satellite Imagery in the Arkansas Valley of Colorado</strong></td>
<td>Luis Garcia and Ayman Elhaddad</td>
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<td>Department of Civil Engineering, Colorado State University</td>
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<td>8:45</td>
<td><strong>Estimating Soil Salinity from Remote Sensing Data in Corn Fields</strong></td>
<td>Ahmed Eldeiry</td>
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<td>Civil Engineering Department, Colorado State University, Fort Collins CO 80523</td>
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<td>Luis A. Garcia</td>
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<td>Civil Engineering Department, Colorado State University, Fort Collins CO 80523</td>
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<td>Robin M. Reich</td>
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<td>Forest, Rangeland and Watershed Stewardship Department, Colorado State University, Fort Collins CO 80523</td>
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<td>9:00</td>
<td><strong>Detecting Soil Salinity Levels in Agricultural Lands Using Satellite Imagery</strong></td>
<td>Ayman Elhaddad</td>
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<td>Luis Garcia</td>
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<td>Department of Forest, Rangeland and Watershed Stewardship, Colorado State University, Fort Collins, CO</td>
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<td>9:30</td>
<td><strong>Effective Use of Spreadsheets for Hydrology and Water Resources Education</strong></td>
<td>Darrell G. Fontane and Jeffrey D. Niemann</td>
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<td>Department of Civil Engineering, Colorado State University, Fort Collins, CO</td>
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<td>9:45</td>
<td><strong>Mid-morning coffee break</strong></td>
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### March 8 10:00 Water Resources Management

**Chair:** Jorge A. Ramirez  
Department of Civil Engineering, CSU  

**Cherokee Park Room - Lory Student Center**

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<tr>
<th>Time</th>
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<th>Institution(s)</th>
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<tbody>
<tr>
<td>10:00</td>
<td>Water Law in Colombia: Experience and Status</td>
<td>Neil S. Grigg</td>
<td>Civil Engineering Department, Colorado State University, Fort Collins, CO 80523</td>
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<tr>
<td>10:30</td>
<td>Decision-support models for efficient irrigation water management—a case study of middle Rio Grande</td>
<td>Ramchand Oad, Luis Garcia and Roy Gallea</td>
<td>Civil Engineering Department, Colorado State University, Fort Collins, CO 80523</td>
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<tr>
<td>10:45</td>
<td>South Platte Decision Support System: Irrigated Lands Assessment And Consumptive Use Modeling</td>
<td>Claudio A. Schneider, PhD</td>
<td>Riverside Technology, inc. Fort Collins, CO 80525</td>
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<td>Erin M. Wilson, PE</td>
<td>3870 Norwood Court, Boulder, Colorado 80304</td>
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<td>Leonard Rice Engineers, Inc.Denver, CO 80228</td>
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<td>Timothy C. Martin, PhD</td>
<td>3870 Norwood Court, Boulder, Colorado 80304</td>
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<td>11:00</td>
<td>A Case Study: San Antonio River Authority Enterprise GIS Implementation</td>
<td>Durmus Cesur</td>
<td>San Antonio River Authority, San Antonio, TX 78229</td>
</tr>
<tr>
<td>11:15</td>
<td>Water Resources in Spain: The Ebro River Interbasin Transfer Project and the &quot;Programa Agua&quot;</td>
<td>Roberto Arranz</td>
<td>Water Resources Planning and Management Division, Civil Engineering Department, Colorado State University, Fort Collins</td>
</tr>
</tbody>
</table>

### March 8 12:00 Lunch break

### March 8 12:00 Presentation of Hydrology Days Award

**Hydrology Days Award Recipient:** C.A. Troendle  
Rocky Mountain Research Station, USDA Forest Service

**Hydrology Days Award Lecture**
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:00</td>
<td><strong>Hydrology Days Award Session I - Watershed Science</strong></td>
<td><strong>Chair: Lee MacDonald</strong>&lt;br&gt;Department of Forest, Range, and Watershed Stewardship, CSU</td>
</tr>
<tr>
<td></td>
<td><strong>Cherokee Park Room - Lory Student Center</strong></td>
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<tr>
<td>2:00</td>
<td><em>The legacy of watershed science at Colorado State University</em></td>
<td>Jim Meiman and Freeman Smith&lt;br&gt;Forest, Range and Watershed Stewardship Department, Colorado State University</td>
</tr>
<tr>
<td>2:20</td>
<td><em>The Effect of Timber Harvest on the Fool Creek Watershed, 49 Years Later</em></td>
<td>Kelly Elder&lt;br&gt;Rocky Mountain Research Station, USDA Forest Service, 240 West Prospect Road, Fort Collins, CO 80526&lt;br&gt;Laurie Porth&lt;br&gt;Rocky Mountain Research Station, USDA Forest Service, 240 West Prospect Road, Fort Collins, CO 80526&lt;br&gt;Chuck Troendle&lt;br&gt;Inventory and Monitoring Institute, USDA Forest Service, 2150 Centre Avenue Building A, Fort Collins, CO 80526</td>
</tr>
<tr>
<td>2:40</td>
<td><em>Subalpine ecosystem nutrient budgets, 1982-2004, Lexen Creek, Fraser Experimental Forest, Colorado</em></td>
<td>Robert Stottlemyer&lt;br&gt;USGS-BRD&lt;br&gt;2150 Centre Ave., Bldg. C&lt;br&gt;Ft. Collins, CO 80526</td>
</tr>
<tr>
<td>3:00</td>
<td><em>Wood dynamics in Rocky Mountain streams over 8 years</em></td>
<td>Ellen Wohl&lt;br&gt;Department of Geosciences, Colorado State University</td>
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<tr>
<td>3:45</td>
<td><strong>Mid-afternoon coffee break</strong></td>
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<tr>
<td>Time</td>
<td>Title</td>
<td>Presenter(s)</td>
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</table>
| 2:00  | Irrigation - Salinity                                                | Chair: Luis Garcia  
Department of Civil Engineering, CSU  
Room 208 - Lory Student Center                                                                   |
| 2:00  | Mass Balances of Irrigation-Induced Salinity and Selenium in Reaches of the Arkansas River | Jennifer Mueller  
Civil Engineering Department, Colorado State University, Fort Collins, CO  
Timothy K. Gates  
Professor, Civil Engineering Department, Colorado State University, Fort Collins, CO |
Civil Engineering Department, Colorado State University, Fort Collins  
Luis A. Garcia  
Civil Engineering Department, Colorado State University, Fort Collins CO 80523  
Robin M. Reich  
Forest, Rangeland and Watershed Stewardship Department, Colorado State University, Fort Collins CO 80523 |
| 2:30  | Water Application and Irrigation Efficiencies in Selected Fields in the Arkansas River Valley | Andres Jaramillo, Luis Garcia and Timothy Gates  
Civil Engineering Department, Colorado State University. Fort Collins |
| 2:45  | Effect of Irrigation and Ammonium Sulfate Fertilizer on Phosphorus Transport through Runoff and Deep Percolation from Grasped Plots | Jennifer E. Morgan  
Civil Engineering Department, Colorado State University, Fort Collins  
Jim C. Loftis  
Professor, Civil Engineering Department, Colorado State University, Fort Collins |
| 3:00  | Evaluation of Application Efficiency of Furrow Irrigation Systems in Clay Soils | Ahmed Eldiery  
Civil Engineering Department, Colorado State University, Fort Collins  
Luis A. Garcia  
Civil Engineering Department, Colorado State University, Fort Collins CO 80523 |
| 3:15  | Sensitivity of Irrigation Water Supply to Climate Change in the Great Plains Region of Colorado | Elgaali Elgaali  
Civil Engineering Department, Colorado State University, Fort Collins  
Luis A. Garcia  
Civil Engineering Department, Colorado State University, Fort Collins |
<p>| 3:45  | Mid-afternoon coffee break                                           |                                                                                                  |</p>
<table>
<thead>
<tr>
<th>March 8 4:00</th>
<th>Hydrology Days Award Session II- Watershed Science</th>
</tr>
</thead>
</table>
| **Chair:** Lee MacDonald  
Department of Forest, Range, and Watershed Stewardship, CSU |
| Cherokee Park Room - Lory Student Center |
| **4:00** | **Landscape controls on the nitrogen biogeochemistry of high elevation ridges** |
| Chuck Rhoades  
US Forest Service, Rocky Mountain Research Station |
| Eugene Kelly  
Department of Crop and Soil Sciences, Colorado State University |
| Banning Starr  
US Forest Service, Rocky Mountain Research Station |
| **4:20** | **Coarse sediment transport observations from St. Louis Creek watershed, Fraser Experimental Forest, Fraser, CO** |
| Sandra E. Ryan-Burkett  
Research Hydrologist/Geomorphologist, USDA Forest Service, Rocky Mountain Research Station, Fort Collins, CO |
| **4:40** | **The East St. Louis Creek debris basin: serving a variety of research questions** |
| Kristin Bunte  
Engineering Research Center, Department of Civil Engineering, Colorado State University, Fort Collins |
| Steven R. Abt  
Engineering Research Center, Department of Civil Engineering, Colorado State University, Fort Collins |
| **5:00** | **Snowpack simulation using the Simultaneous Heat and Water (SHAW) model at a continental subalpine site near Fraser, Colorado, USA** |
| Angus Goodbody  
USDA Forest Service, Rocky Mountain Research Station, Fort Collins, CO 80526, USA  
Gerald Flerchinger  
USDA Agricultural Research Service, Northwest Watershed Research Center, Boise, ID 83712, USA  
Kelly Elder  
USDA Forest Service, Rocky Mountain Research Station, Fort Collins, CO 80526, USA |
| March 8 4:00 | Urban Hydrology |
| **Chair:** Larry Roesner  
Department of Civil Engineering, CSU |
| Room 208- Lory Student Center |
| **4:00** | **Are Our Urban Runoff Design Practices Really Saving Our Stream?** |
| Larry A. Roesner, P.E.  
Civil Engineering, Colorado State University |
<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
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</thead>
</table>
| 4:15  | An analytical approach to obtain the cumulative distribution function for maximum discharges and total volumes in Urban Watersheds | P. Rivera  
Departmento de Ingeniería Hidráulica y Ambiental, Universidad Católica de Chile, Santiago, Chile  
J. Gironás, Department of Civil Engineering, Colorado State University, Fort Collins, Colorado 80523 USA  
J. P. Montt and B. Fernández  
Departmento de Ingeniería Hidráulica y Ambiental, Universidad Católica de Chile, Santiago, Chile |
| 4:30  | Impacts of Septic Tank Effluent from a Proposed Residential Development on Water Quality, Adams County, Colorado | Kirk Heatwole  
Environmental Systems Modeling, Environmental Science and Engineering Division, Colorado School of Mines, Golden  
John McCray  
Environmental Science and Engineering Division, Colorado School of Mines, Golden |
| 4:45  | An urban geomorphic assessment of the Berryessa Creek and Upper Penitencia Creek watersheds in San José, CA | Brett Jordan, C.C. Watson  
Department of Civil Engineering, Colorado State University, Fort Collins CO  
W.K. Annable  
Department of Civil Engineering, University of Waterloo, Waterloo, Ontario, Canada  
D. Sen  
Santa Clara Valley Water District, 5750 Almaden Expressway, San Jose, CA |
| 5:00  | Modification of Anaerobic Digestion Model No. 1 for Accumulation and Biomass Recycling | Durmus Cesur  
San Antonio River Authority, 100 East Guenther, San Antonio TX 78229  
Maurice L. Albertson  
Civil Engineering Department, Colorado State University, Fort Collins, CO 80523 |
## March 9

### March 9  8:00  Climate - Drought

**Chair:** Jorge A. Ramirez  
*Department of Civil Engineering, CSU*

**Cherokee Park Room - Lory Student Center**

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Authors and Affiliations</th>
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</thead>
</table>
| 8:45  | **Influence of Hydroclimate on Characteristics of Hydrograph Evolution in Snowmelt-Dominated River Systems** | Matter, Margaret A., Luis Garcia and Darrell Fontane  
Civil Engineering Department, Colorado State University, Fort Collins                                                                                      |
| 9:00  | **A review of the 2004 water year in Colorado**                                            | Nolan J. Doesken  
Colorado Climate Center, Atmospheric Science Department, Colorado State University, Fort Collins  
Michael A. Gillespie  
Snow Survey Division, Natural Resources Conservation Service, US Department of Agriculture, Lakewood, Colorado |
| 9:15  | **Drought Impacts on the timing and influent water quality to Barr Lake, Colorado**        | Curtis Cooper  
Department of Soil and Crop Sciences, Colorado State University, Fort Collins 80523-1130. Curtis.Cooper@ColoState.edu  
David Gilbert  
Department of Civil Engineering, Colorado State University, Fort Collins 80523-1372  
John Stednick  
Department of Forest, Range and Watershed Stewardship, Colorado State University, Fort Collins 80523-1472 |
| 9:30  | **Agricultural water quality in eight off-channel reservoirs in the South Platte River Basin, Colorado** | Curtis Cooper  
Department of Soil and Crop Sciences, Colorado State University, Fort Collins 80523-1130.  
John Stednick  
Department of Forest, Range and Watershed Stewardship, Colorado State University, Fort Collins 80523-1472  
Emile Hall Elias  
Auburn University |
<p>| 9:45  | <strong>Mid-morning coffee break</strong>                                                              |                                                                                                                                                    |</p>
<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Presenter(s)</th>
<th>Institution(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:00</td>
<td>Soil Moisture Dynamics - Water Balance</td>
<td>Tim Gates</td>
<td>Department of Civil Engineering, CSU</td>
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<td>Cherokee Park Room - Lory Student Center</td>
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<tr>
<td>10:00</td>
<td>Estimating Seasonality Impact on Catchment-Scale Water Balance Using Top-down Approach</td>
<td>Klaus Hickel and Lu Zhang</td>
<td>CSIRO Land and Water, Christian Laboratory, Canberra, A.C.T. Australia</td>
</tr>
<tr>
<td>10:15</td>
<td>Identifying the importance of regional characteristics on soil moisture patterns across a range of scales</td>
<td>Summer Conklin and Jeffrey D. Niemann</td>
<td>Department of Civil Engineering, Colorado State University</td>
</tr>
<tr>
<td>10:30</td>
<td>Typhoon Maemi and Impacts on Lower Nakdong River, South Korea</td>
<td>Un Ji and Pierre Julien</td>
<td>Civil Engineering, Engineering Research Center, Colorado State University, Fort Collins</td>
</tr>
<tr>
<td>10:45</td>
<td>Updated Database of the Middle Rio Grande, New Mexico</td>
<td>Susan Novak and Pierre Julien</td>
<td>Department of Civil Engineering, Colorado State University, Fort Collins, CO</td>
</tr>
<tr>
<td>11:00</td>
<td>Hydrologic interactions between an alluvial fan and a slope wetland in the central Rocky Mountains</td>
<td>Scott W. Woods, Lee H. MacDonald, C. Westbrook</td>
<td>University of Montana, Dept. of Ecosystem and Conservation Sciences, Missoula MT 59812 Colorado State University, Dept. of Forest, Rangeland and Watershed Stewardship, Fort Collins, CO</td>
</tr>
<tr>
<td>11:15</td>
<td>Water Law in Colombia: Experience and Status</td>
<td>Neil S. Grigg</td>
<td>Civil Engineering Department, Colorado State University, Fort Collins, CO</td>
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<tr>
<td>12:00</td>
<td>Lunch break</td>
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<tr>
<td>2:00</td>
<td>Groundwater - Remediation - Industrial Releases I</td>
<td>David Gilbert</td>
<td>Department of Civil Engineering, CSU</td>
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<td>Cherokee Park Room - Lory Student Center</td>
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<tr>
<td>2:00</td>
<td>Elements of a Well-Designed Protocol for Managing Releases of Chlorinated Solvent</td>
<td>Tom Sale</td>
<td>Civil Engineering Department, Colorado State University, Fort Collins, CO</td>
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<tr>
<td>Time</td>
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</tbody>
</table>
| 2:15  | Lumping analysis for abiotic transport modeling of an organic pollutant mixture | Jin Chul Joo  
Civil Engineering Department, Colorado State University, Fort Collins, CO  
Timothy B. Miller  
Chemical Engineering Department, Colorado State University, Fort Collins, CO  
Charles D. Shackelford  
Civil Engineering Department, Colorado State University, Fort Collins, CO  
Kenneth F. Reardon  
Chemical Engineering Department, Colorado State University, Fort Collins, CO |
| 2:30  | Phosphorus sorption and precipitation characterization at a wastewater infiltration site; Mines Park, CO | Sarah E. Doyle, John E. McCray, Geoffrey D. Thyne, Kathryn S. Lowe  
Colorado School of Mines, Golden CO |
| 2:45  | Improved reagent delivery using hydraulic fracturing during enhanced reductive dechlorination | James Dawe, P.G.  
ARCADIS, Highlands Ranch, Colorado, USA  
Scott D. Andrews, P.E. and Craig Divine, Ph.D.  
ARCADIS, Highlands Ranch, Colorado, USA |
| 3:00  | Prediction of ZVI-Clay Performance for Remediation of Chlorinated Solvent Source Zones | Mitchell Olson and Tom Sale  
Department of Civil Engineering, Colorado State University, Fort Collins, CO 80523-1320 |
| 3:15  | Comparison of inocula applied in the remediation of heavy metals by sulfate reduction | L.P. Pereyra  
Department of Civil Engineering, Colorado State University  
R. Hanson  
Department of Chemical Engineering, Colorado State University  
S. Hiibel  
Department of Chemical Engineering, Colorado State University  
A. Pruden  
Department of Civil Engineering, Colorado State University  
K.F. Reardon  
Department of Chemical Engineering, Colorado State University |
| 3:30  | Modified Use of the “SDF” Semi-Analytical Stream Depletion Model in Bounded Alluvial Aquifers | Calvin D. Miller and Deanna S. Durnford  
Civil Engineering Department, Colorado State University, Fort Collins, Colorado |
<p>| 3:45  | Mid-afternoon coffee break                                             |                                                                        |</p>
<table>
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<tr>
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<tr>
<td>2:00</td>
<td><strong>Snow Hydrology I</strong></td>
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</table>
|       | **Chair:** Steven Fassnacht  
**Department of Forest, Range, and Watershed Stewardship, CSU**       |
|       | **Room 213/215 - Lory Student Center**                                   |
| 2:00  | **NASA Cold Land Processes Experiment (CLPX): Field Measurements of Snowpack Properties and Soil Moisture**  
Kelly Elder  
Rocky Mountain Research Station, USDA Forest Service, 240 West Prospect Road, Fort Collins, CO 80526  
Don Cline  
National Operational Hydrological Remote Sensing Center, National Weather Service, 1735 Lake Drive West, Chanhassen, MN 55317  
Glen Liston  
Department of Atmospheric Sciences, Colorado State University, Fort Collins, CO 80523  
Richard Armstrong  
National Snow and Ice Data Center, University of Colorado, Boulder, CO 80309 |
| 2:20  | **Analysis of the scaling characteristics of snow depth in the Colorado Rocky Mountains**  
Ernesto Trujillo-Gómez and Jorge A. Ramírez  
Department of Civil Engineering, Colorado State University, Fort Collins, CO 80523-1372, USA  
Kelly Elder  
Rocky Mountain Research Station, USDA Forest Service, Fort Collins, CO 80526, USA |
| 2:40  | **Fractal distribution of snow depth from LiDAR data**  
Jeffrey S. Deems  
Geosciences, Colorado State University  
Steven R. Fassnacht  
Watershed Science, Colorado State University  
Kelly J. Elder  
US Forest Service Rocky Mountain Experiment Station, Fort Collins, CO |
| 3:00  | **Scalability and Measurement Density for Montane Snow Depth and Elevation Data at Several Colorado Sites**  
S.R. Fassnacht and J.S. Deems  
Watershed Sciences Program, Colorado State University, Fort Collins, CO |
| 3:20  | **Scaling snow observations from the point to the grid-element: implications for observation network design.**  
Noah Molotch  
Cooperative Institute for Research in Environmental Sciences (CIRES)  
University of Colorado  
Roger Bales  
Division of Engineering, University of California, Merced |
<p>|       | Mid-afternoon coffee break                                              |</p>
<table>
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<th>Authors</th>
<th>Institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:00</td>
<td><strong>Use of carboxymethyl-beta-cyclodextrin (CMCD) as flushing agent for remediation of metal contaminated soil</strong></td>
<td>Skold, Magnus.V., Thyne, Geoffrey. D.</td>
<td>Department of Geology and Geological Engineering, Colorado School of Mines, Golden, CO</td>
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<td>McCray, John. E.</td>
<td>Environmental Science and Engineering Division, Colorado School of Mines, Golden, CO</td>
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<td>Drexler, John. W.</td>
<td>Geological Sciences, University of Colorado at Boulder, CO</td>
</tr>
<tr>
<td>4:15</td>
<td><strong>Field Analysis of LNAPL Flux Using Well Bore Dilution Techniques</strong></td>
<td>Gabriel Iltis, Ryan Taylor and Tom Sale</td>
<td>Civil Engineering Department, Colorado State University, Fort Collins, CO</td>
</tr>
<tr>
<td>4:30</td>
<td><strong>Electrolytic Reactive Barriers for Treatment of Energetic Compounds in Groundwater</strong></td>
<td>David Gilbert and Tom Sale</td>
<td>Department of Civil Engineering, Colorado State University</td>
</tr>
<tr>
<td>4:45</td>
<td><strong>AFCEE Source Zone Initiative - Back Diffusion of Contaminants in Source Zones and Plumes</strong></td>
<td>Julio Zimbron</td>
<td>Department of Civil Engineering, Colorado State University, Fort Collins, CO 80523</td>
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<td></td>
<td></td>
<td>Tom Sale</td>
<td>Department of Civil Engineering, Colorado State University, Fort Collins, CO 80523</td>
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<td>David Dandy</td>
<td>Department of Chemical Engineering, Colorado State University, Fort Collins, CO 80523</td>
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<td>Tissa Illangasekare</td>
<td>Division of Environmental Science and Engineering, Colorado School of Mines, Golden, CO 80401</td>
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<td>Derrick Rodriguez</td>
<td>Division of Environmental Science and Engineering, Colorado School of Mines, Golden, CO 80401</td>
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<td>Bart Wilking</td>
<td>Division of Environmental Science and Engineering, Colorado School of Mines, Golden, CO 80401</td>
</tr>
<tr>
<td>5:00</td>
<td><strong>Carbon tetrachloride removal from a heterogeneous porous medium by two soil vapor extraction techniques</strong></td>
<td>M. Oostrom</td>
<td>Environmental Technology Division, Pacific Northwest National Laboratory, Richland, Washington</td>
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<td>J.H. Dane</td>
<td>Department of Agronomy and Soils, Auburn University, Alabama</td>
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<td>T.W. Wietsma</td>
<td>Environmental Molecular Sciences Laboratory, Pacific Northwest National Laboratory, Richland, Washington</td>
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<tr>
<td>5:15</td>
<td><strong>Numerical simulation of surface barriers for shrub-steppe ecoregions</strong></td>
<td>Mark D. White and Andy L. Ward</td>
<td>Hydrology Group, Environmental Technology Directorate, Pacific Northwest National Laboratory, Richland, Washington</td>
</tr>
</tbody>
</table>
### 5:30 Effects of Water Saturation on a Resistivity Survey of an Unconfined Fluvial Aquifer in Columbus, MS

John W. Koster (MS)  
Department of Geosciences, Natural Resources  
Colorado State University  
Fort Collins, CO 80523  
Tel: (970) 420-5686  
e-mail: jkoster@cnr.colostate.edu  
Dennis L. Harry  
Department of Geosciences, Natural Resources  
Colorado State University  
Fort Collins, CO 80523  
e-mail: dharry@cnr.colostate.edu

<table>
<thead>
<tr>
<th>March 9</th>
<th>4:00</th>
<th>Snow Hydrology II</th>
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</thead>
</table>
| **Chair:** Steven Fassnacht  
Department of Forest, Range, and Watershed Stewardship, CSU|
| **Room 213/215 - Lory Student Center** |

#### 4:00 Modeling Distributed Snowpack Properties as a Mechanism for Identifying Elk Distribution Patterns in the Northern Elk Winter Range, Yellowstone National Park

Craig Anderson and Mark Williams  
Department of Geography, University of Colorado-Boulder  
Institute of Arctic and Alpine Research (INSTAAR)  
Robert Crabtree  
Yellowstone Ecological Research Center  
Bozeman, Montana

#### 4:20 Evaluation of Two Ultrasonic Snow Depth Sensors for National Weather Service Automated Surface Observation System Sites

W.A. Brazenec  
Department of Forest, Rangeland and Watershed Stewardship, Colorado State University, Fort Collins, Colorado USA 80523-1472  
N.J. Doesken  
Department of Atmospheric Sciences, Colorado State University, Fort Collins, Colorado USA 80523-1371  
S.R. Fassnacht  
Department of Forest, Rangeland and Watershed Stewardship, Colorado State University, Fort Collins, Colorado USA 80523-1472

#### 4:40 Probabilistic snow mapping using station data

Martyn P. Clark and Andrew G. Slater  
Center for Science and Technology Policy Research, University of Colorado, Boulder

#### 5:00 Physiographic Influences on Snowpack Variability in the Upper Colorado Basin using Snowpack Telemetry (SNOTEL) data

J. Derry and S.R. Fassnacht  
Watershed Science Program, College of Natural Resources, Colorado State University, Fort Collins, Colorado, USA