

*AGU Hydrology Days 2000
Colorado State University*

Twentieth Annual
AGU HYDROLOGY DAYS

**CONFERENCE PROGRAM
AND
ABSTRACTS**

April 3 – 6, 2000
Cherokee Park Room
Lory Student Center
Colorado State University
Fort Collins, CO 80523-1372

CONFERENCE PROGRAM

Date	Start	Speaker/Title
April 3, 2000	09:30	Registration – Outside of Virginia Dale Room – Lory Student Center
	10:20	Session Chair: Jim Loftis Professor, Chemical and Bio-resource Engineering
		Cherokee Park Room – Lory Student Center
	10:20	Soap Contamination in Effluent; JoAnne Volk; Environmental and Lab Superintendent at Weldwood of Canada Limited - Hinton Division, Hinton, Alberta, Canada. phone (780) 865-8529, fax (780) 865-8550.; e-mail is joanne_volk@weldwood.com
	10:40	“De Facto” Data Analysis Methods for Goal Oriented Monitoring: What does current practice tell us? Lindsay Melissa Martin (M.S.); Department of Chemical and Bioresource Engineering; Colorado State University; Ft. Collins, CO 80523; (wk) 970-491-1141 (Fax) 970-491-7469; lindsay@engr.colostate.edu
	11:00	Field Scale Monitoring of Salinity in the Arkansas River Basin; Ayman Elhaddad; Department of Civil Engineering, Colorado State University; Luis A. Garcia; Department of Civil Engineering, Colorado State University
	11:20	Multi-component Surrogate and Tracer Mixture Used to Evaluate Wastewater Treatment in Soil; Sheila Van Cuyk; Ph.D. Student, Environmental Science and Engineering, Colorado School of Mines 1500 Illinois Street, Golden, CO 80401, Ph: 303.384.2003, Fax: 303.273.3413; e-mail: svancuyk@mines.edu ; ; Robert Siegrist; Associate Professor, Environmental Science and Engineering, Colorado School of Mines, Golden, CO 80401
	11:40	A Laboratory Investigation of Dissolved Helium and Neon as Dense Nonaqueous Phase Liquid (DNAPL) Partitioning Tracers; Craig E. Divine; Earth Resources Department, Colorado State University, Fort Collins, Colorado; Now at: ARCADIS Geraghty & Miller, Inc., 1099 18th Street, Suite 2100, Denver Colorado 80202, cdivine@gmgw.com , (303) 294-1200.; William E. Sanford; Watershed Science Program, Earth Resources Department, Colorado State University, Fort Collins, Colorado
	12:00	Lunch
	April 3, 2000	13:20
		Cherokee Park Room – Lory Student Center
	13:20	Pressure Flow Effects on Local Scour in Bridge Openings; Michael Robeson,; Graduate Research Assistant; Department of Civil Engineering, Colorado State University, Fort Collins, CO mrobeson@engr.colostate.edu

- April 3, 2000 13:40 **Hydraulic Controls on Flow Properties in Bedrock Channels: Evidence from Lateral Potholes;** Gregory S. Springer ; Colorado State University, Fort Collins, CO 80523
- 14:00 **Identifying opportunities for investigating the effects of temperature on infiltration and implications for modelling the hydrologic response of watersheds;** Robert H. Erskine ; USDA, Agricultural Research Service, Great Plains Systems Research Unit, Fort Collins, CO 80522; Department of Civil Engineering, Colorado State University, Fort Collins, CO 80523; Jorge A. Ramírez; Department of Civil Engineering, Colorado State University, Fort Collins, CO 80523; Timothy R. Green USDA, Agricultural Research Service, Great Plains Systems Research Unit, Fort Collins, CO 80522
- 14:20 **Acequias and Adjudication: An Historical and Spatial Analysis Utilising Geographic Information Systems;** Maureen Newcomb; Department of Civil Engineering, CSU
- 14:40 **Tree Water Relations and Hydraulic Architecture: A Crisis in the Science;** Chris Williams; CSU Dept of Earth Resources, candidate for MS
- 15:00 Mid-afternoon break
- 15:20 **Session Chair: Chester Watson,**
Associate Professor, Department of Civil Engineering
- Cherokee Park Room – Lory Student Center**
- April 3, 2000 15:20 **Discontinuity of Stage-Discharge Rating Curves Due to Dunes;** Dan Gessler; Department of Civil Engineering, Colorado State University
- 15:40 **Field tools for improving the accuracy of pebble counts in wadable coarse gravel-bed streams;** Kristin Bunte¹ and Steven R. Abt²; ¹, ² Engineering Research Center, Colorado State University, Fort Collins, CO 80523.; ¹ Phone: (970) 491-3980; Fax: (970) 491-8671; email: kbunte@engr.colostate.edu; ² Phone: (970) 491-8203; Fax: (970) 491-8462; e-mail: sabt@engr.colostate.edu
- 16:00 **Current Topics of Research Conducted at Colorado State Hydraulics Lab;** Chad M. Lipscomb; Research Associate, Department of Civil Engineering Department, Colorado State University
- 16:20 **Hydraulic Parameters Affecting The Application of Optimal Channel Networks To Hillslope Erosion;** David Raff; Civil Engineering Department, Colorado State University; raff@cnr.colostate.edu
- 16:40 **Planning and Management Considerations for a Stream Field Reconnaissance;** Chris Holmquist-Johnson and David Mooney Department of Civil Engineering, Colorado State University; Ft Collins, CO 80523-1372; e-mail: chrisj@lamar.colostate.edu; and David_Mooney77@hotmail.com

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- April 4, 2000 08:00 Registration – Outside of Virginia Dale Room – Lory Student Center
- 08:20 **Session Chair: Timothy Gates,**
Associate Professor, Civil Engineering Department
- Cherokee Park Room – Lory Student Center**
- 08:20 **Multifractal downscaling of space-time rainfall fields;** Luca Ferraris; Centro di ricerca in monitoraggio ambientale, University of Genoa, Italy; Dipartimento di ingegneria ambientale, University of Genoa, Italy. E-mail: lf@cima.unige.it; Ulderica Parodi; Centro di ricerca in monitoraggio ambientale, University of Genoa, Italy; Dipartimento di ingegneria ambientale, University of Genoa, Italy; Franco Siccardi; Centro di ricerca in monitoraggio ambientale, University of Genoa, Italy; Dipartimento di ingegneria ambientale, University of Genoa, Italy
- 08:40 **Applying Ensemble Forecasting to Hydrologic Drought Risk Analysis;** M. L. Anderson; Civil and Environmental Engineering Department, UC Davis; E-mail: mlanderson@ucdavis.edu; M. L. Kavvas, M. D. Mierzwa; Civil and Environmental Engineering Department, UC Davis
- 09:00 **Regional Frequency Analysis of Extreme Precipitation for Northeastern Colorado;** Oli G. B. Sveinsson and Jose D. Salas; Department of Civil Engineering, Colorado State University; Duane C. Boes; Department of Statistics, Colorado State University
- 09:20 **A semi-statistical methodology for regional flood risk assessment;** L. Ferraris; Centro di Ricerca in Monitoraggio Ambientale, University of Genova, Via Cadorna 7, 17100 Savona Italy – e-mail: lf@cima.unige.it ; U. Parodi; Centro di Ricerca in Monitoraggio Ambientale, University of Genova, Via Cadorna 7, 17100 Savona Italy – e-mail: ulde@cima.unige.it ; G. Roth; DIAM – Dipartimento di Ingegneria Ambientale, University of Genova, Via Montallegro 1, 16146 Genova, Italy – e-mail: giorgio@cima.unige.it
- 09:40 **Flash Flood Laboratory Colorado State University; Christopher R. Adams, Eve Grunfest, and Kenneth E. Eis;** Flash Flood Laboratory; Cooperative Institute for Research in the Atmosphere; Colorado State University; Fort Collins, CO 80526; (970) 491-3899; fax (970) 491-8241; e-mail: adams@cira.colostate.edu
- 10:00 Mid-morning break
- April 4, 2000 10:20 **Session Chair: Jose D. Salas,**
Professor, Department of Civil Engineering
- Cherokee Park Room – Lory Student Center**
- 10:20 **Phenomenological interpretation of the frequency distribution of annual rainfall maxima in the mediterranean region;** Antonio Parodi; Centro di Ricerca in Monitoraggio Ambientale, University of Genova, Cadorna, 7 - 17100 Savona, Italy.; Giorgio Boni; Centro di Ricerca in Monitoraggio Ambientale, University of Genova, Cadorna, 7 - 17100 Savona, Italy.; Franco Siccardi; Centro di Ricerca in Monitoraggio Ambientale, University of Genova, Cadorna, 7 - 17100 Savona, Italy. E-mail: franco@idra.unige.it

- April 4, 2000 10:40 **New Analyses of Extreme Precipitation Events Along the Front Range of Colorado;** Thomas H. Vonder Haar, Donald L. Reinke, Kelly R. Dean; Cooperative Institute for Research in the Atmosphere/Center for Geosciences; Colorado State University ; Fort Collins, CO 80523-1375; Phone: (970) 491-8465, Fax: (970) 491-8241, Email: reinke@cira.colostate.edu
- 11:00 **Characterizing Probabilistic Flood Hazards for Reclamation Dams;** John F. England, Jr. and Daniel R. Levis; U.S. Bureau of Reclamation, P.O. Box 25007, Denver, CO 80225
- 11:20 **Estimation of Upper Tail Pareto-Quantiles from Upper Order Statistics;** Oli G. B. Sveinsson Department of Civil Engineering, Colorado State University; e-mail: oli@lamar.colostate.edu; Duane C. Boes Department of Statistics, Colorado State University,; Jose D. Salas; Department of Civil Engineering, Colorado State University, Fort Collins
- 11:40
- 12:00 Luncheon – Longs Peak Room
- Keynote Speaker: Larry Roesner, Ph.D.** Professor and holder of the Harold H. Short Chair in Infrastructure and Environmental Systems, Civil Engineering Department, CSU.
- Topic: **Research and Education Needs in the Workplace.**
- April 4, 2000 13:40 **Session Chair: Robert Ward,**
Professor, Chemical and Bio-resource Engineering
- Cherokee Park Room – Lory Student Center**
- 13:40 **Effects of Forest Management on Streamflow: A Meta-analysis of Paired Watershed Data Using Flow Duration Curves;** L. H. MacDonald and S. A. Austin; Dept. of Earth Resources, Colorado State University, Fort Collins, CO 80523-1482; leemac@cnr.colostate.edu
- 14:00 **Streamflows of North Saint Vrain Creek, Rocky Mountain Front Range, Colorado;** Robert T. Milhous; Midcontinent Ecological Science Center, U.S. Geological Science Center, 4512 McMurry Avenue, Fort Collins, Colorado, 80525-3400; email: robert_milhous@usgs.gov; phone: 970 226 9322, fax 970 226 9230
- 14:20 **A quantification of factors that affect incision in the Rio Puerco watershed, New Mexico;** Stephanie J. Phippen; Colorado State University; Department of Earth Resources Natural Resources 322 · Fort Collins, CO 80523; Phone: 970-491-3939; Email: hippen@cnr.colostate.edu
- 14:40 **Prescribed Fire Effects in Northern Colorado Front Range Watersheds ;** Bob Lange; Research Associate; Chemical and Bioresource Engineering Department, Colorado State University; lange@engr.colostate.edu
- 15:00 **Post-Lahar Channel Adjustment of the Muddy River, Mount St. Helens, Washington;** Jasper H. Hardison III; Colorado State University ; Department of Earth Resources; 322 Natural Resources Building; Fort Collins, CO 80523

April 4, 2000 15:20 **Poster Session – East Ballroom – Lory Student Center**

Two Inexpensive Systems for Receiving Weather Watches, Warnings, and Other Pertinent Weather Information - NOAA Weather Radio and EMWIN; Kelly Dean, Michael Hiatt, and Christopher R. Adams;
Cooperative Institute for Research in the Atmosphere, Colorado State University, Fort Collins.; E-mail: dean@cira.colostate.edu

Climate change: Implications for the recovery of the greenback cutthroat trout; Scott Cooney and Alan Covich; Department of Fishery and Wildlife Biology, Colorado State University

Predicting Woody Riparian Seedling Establishment in Response To Hypothetical Reservoir Releases; Lee, Victor J; Department of Civil Engineering, Colorado State University, Fort Collins, Colorado and Johnson Controls Inc. Fort Collins, Colorado; Patrick B. Shafroth.; U.S. Geological Survey, Midcontinental Ecological Science Center, Fort Collins, Colorado; Duncan T. Patten.; Department of Plant Biology, Arizona State University; Juliet C. Stromberg.; Department of Plant Biology, Arizona State University, Tempe, Arizona

Effect of Salinity on Phytoaccumulation of Selenium in Duckweed (*Lemna minor*); Anthony Johnson; Department of Environmental Health, Colorado State University; tjohnson@uswestmail.net; John Nuckols, Ph.D.; Department of Environmental Health, Colorado State University; Elizabeth Pilon-Smits, Ph.D.; Department of Biology, Colorado State University

Numerical Simulation of Unsaturated Water Flow and Pollutant Transport in Soil-Based Wastewater Treatment Systems with Clogged Infiltrative Surfaces; D. Huntzinger¹, J. McCray², S. Van Cuyk³; M.S. student, Department of Geology and Geological Engineering, Colorado School of Mines, 1500 Illinois St, Golden, CO 80401-1887, Tel. 303.384-2011, Fax. 303.372.3859. E-mail: dhuntzin@mines.edu; Department of Geology and Geological Engineering, Colorado School of Mines, Golden, CO 80401.; Environmental Systems Engineering Division. Colorado School of Mines, Golden, CO 80401

Hydrological Transformations in Jaguaribe River Basin during 20th Century; Campos, J.N.B., Studart, T.M.C. , Franco, S. R. and Luna, R.; Department of Water Resources and Environmental Engineering, Universidade Federal do Ceará, P.O. Box 6018, Fortaleza, Ceará, Brazil, 60451-970, Fax: (+55) 85 288-9627; e-mail: tician@ufc.br

Preliminary Paleohydrological Investigations at Kaplan-Hoover Archaeological Site; Rose Wallick; Department of Earth Resources, Watershed Science Program, Colorado State University

Sub-pixel scale effects of Hortonian overland flow; Nick van de Giesen¹, Tjeerd Jan Stomph², and Nico de Ridder² ; 1. Center for Development Research, University of Bonn, Walter-Flex-Strasse 3, D-53113 Bonn, Germany; 2. Wageningen University, Department of Plant Science, P.O.Box 341, 6700 AH Wageningen, The Netherlands .

The Effect of Variations in Hydrogeologic and Physicochemical Transport Properties on the Model-Predicted Vulnerability of Colorado Groundwater to Pesticides; Schlosser, Stephanie A., and McCray, John E.,; Geochemistry Program, Department of Geology and Geological Engineering, Colorado School of Mines, 1500 Illinois St. Golden, CO 80401-1887, saschlos@mines.edu; Wascom, Reagan,; Department of Soil and Crop Science, Colorado State Univ., Fort Collins, CO 80523

A reinterpretation of Horton's Law of Stream Numbers in terms of distributional rescaling; Dr. Seth Veitzer ; CIRES/CCCC ; University of Colorado, Boulder ; Boulder, CO 80309 ; 303-492-8124 ; 303-492-5070 (fax); veitzer@cires.colorado.edu; Vijay K. Gupta; Department of Civil Engineering, University of Colorado, Boulder

Effects of Overland and Subsurface Lateral Flow on Soil Water Variability at the Field Scale; H. Ruan, T.R. Green, L.R. Ahuja, and J.C. Ascough II; Great Plains Systems Research, USDA-ARS, Fort Collins, CO

Using A Regional Atmospheric Modeling System To Simulate Seasonal Precipitation in Western Colombia; Saul Marin and Jorge A. Ramirez; Civil Engineering Department, Colorado State University

Forecasting Monthly Flows of the South Platte Based on Contemporaneous PARMAX Models. A. Cancelliere, J.D. Salas; Department of Civil Engineering, CSU and D.C. Boes; Department of Statistics, CSU

Uncertainty Analysis of Flood Quantiles Based on Gamma Distributions. Y.C. Chen, J.D. Salas; ; Department of Civil Engineering and D.C. Boes; Department of Statistics, CSU

- April 4, 2000 16:40 **Special Workshop – Room B101 Engineering Building Workshop** on IDL and RiverTools Software for basin delineation from DEM data. Topics will include visualization tools for image, contour, river network vector and surface display, flow grid extraction, mosaicking, mapping, and calculation of area, slope, channel length, elevation drop, etc. Refreshments to be presented by Research Systems.
- April 5, 2000 08:00 Registration – Outside of Virginia Dale Room – Lory Student Center
- 08:20 **Session Chair: Jorge A. Ramírez**
Associate Professor, Civil Engineering
- Cherokee Park Room – Lory Student Center**
- 08:20 **Emphasis On Drainage Morphology and Spatial Variability in Hydrologic Simulations: The Drift Model.;** F. Giannoni, G. Roth and R. Rudari.; (CIMA - Centro di Ricerca in Monitoraggio Ambientale, University of Genova.; Via Cadorna 7, 17100 Savona, Italy; +39 019 230271, fax. +39 019 862612, ; DIAM - Dipartimento di Ingegneria Ambientale, University of Genova, ; Via Montallegro 1, 16146 Genova, Italy, +39 010 3532432 ; e-mail: giorgio@diam.unige.it); a - Ph. D. Student; b - Professor
- 08:40 **Recent Advances in River Network Theories;** Dr. Seth Veitzer ; CIRES/CCCC ; University of Colorado, Boulder ; Boulder, CO 80309 ; 303-492-8124 ; 303-492-5070 (fax) ; veitzer@cires.colorado.edu

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- April 5, 2000 09:00 **Quantitative mapping of erosive incision;** Raymond D. Watts; U.S. Geological Survey; USGS/CIRA, CSU Foothills Campus; Fort Collins, CO 80523; Phone: 970-491-3982; Fax: 970-491-8241; E-mail: rwatts@usgs.gov
- 09:20 **Regional Discharge and Channel Geometry Relationships For Natural Channel Design in Oklahoma;** Russell C. Dutnell; School of Civil Engineering and Environmental Science, University of Oklahoma, Norman; Randall L. Kolar; School of Civil Engineering and Environmental Science, University of Oklahoma, Norman
- 09:40 **Simple flow routing with discharge-dependent celerity, fractional lag and bank overflow;** Hubert J. Morel-Seytoux; Emeritus Professor of Civil Engineering, Colorado State University; Hydrology Days Publications
- 10:00 Mid-morning break
- April 5, 2000 10:20 **Session Chair: Alan Covich,**
Professor, Department of Fishery and Wildlife Biology
- Cherokee Park Room – Lory Student Center**
- 10:20 **Biological Aspects of the Hydrologic Cycle: Regional Vulnerability Issues;** Roger A. Pielke Sr.; Department of Atmospheric Science, Colorado State University
- 10:40 **Sensitivity of a high elevation Rocky Mountain catchment to altered climate and CO₂;** Jill Baron, Bill Parton, Melannie Hartman, and Tom Stohlgren; Natural Resources Ecology Laboratory, Colorado State University
- 11:00 **Modeling the Continental-Scale Dynamics of the Coupled Land-Surface and Atmospheric Water Balances with a Stochastic Differential Equation;** John P. Kochendorfer and Jorge A. Ramirez; Department of Civil Engineering, Colorado State University
- 11:20 **A Review of the 1999 Water Year in Colorado;** Nolan J. Doesken ; Colorado Climate Center ; Department of Atmospheric Science ; Colorado State University ; Fort Collins, CO 80523 ; (970) 491-8545; Michael A. Gillespie ; Snow Survey Division; USDA - Natural Resources Conservation Service ; 655 Parfet Street, Room E200C ; Lakewood, CO 80215-5517 ; (303) 236-2906
- 11:40 **The Colorado Collaborative Rain and Hail Study -- Community Participation in Hydroclimatic Research and Education;** Nolan J. Doesken ; Colorado Climate Center ; Department of Atmospheric Science ; Colorado State University; Fort Collins, CO 80523 ; (970) 491-8545 ; nolan@ccc.atmos.colostate.edu

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- April 5, 2000 12:00 Luncheon – Longs Peak Room
Panel Discussion:
Water Earth Biota - WEB: A Framework for Research and Education in Hydrology
Panelists:
Vijay Gupta, Panel Chair. Professor, Civil Engineering Department, University of Colorado at Boulder.
Robert Grossman. Professor, Program in Oceanic and Atmospheric Science, University of Colorado, Boulder
Roger A. Pielke, Sr. Professor, Department of Atmospheric Science, Colorado State University
Jose D. Salas, Professor, Department of Civil Engineering, Colorado State University
Robert Ward, Professor, Department of Civil Engineering, Colorado State University
- 13:20 **Session Chair: Jorge A. Ramírez**
Associate Professor, Civil Engineering
- Cherokee Park Room – Lory Student Center**
- April 5, 2000 13:20 **Scaling Studies of Surface-Atmosphere Interactions at a Very Tall Tower Site in Wisconsin;** Denning, A. S., Nicholls, M., Prihodko, L., Uliasz, M., Zhang, N., and Vidale, P.-L.; Department of Atmospheric Science, Colorado State University; e-mail: denning@atmos.colostate.edu
- 13:40 **Prediction of flash flood in complex terrain using rainfall estimates from radar and very-short-range rainfall simulations from a dynamic model and an automated algorithmic system;** David Yates^{1,2} and Tom Warner^{1,3}; ¹ National Center for Atmospheric Research, Research Applications Program; ² Dept. of Civil Engineering, University of Colorado, Boulder; ³ Program in Oceanic and Atmospheric Science, University of Colorado, Boulder
- 14:00 **Application of meteorological mesoscale model ALADIN-SI for hydrological forecast;** Prof. Dr. M. Brilly⁽¹⁾, Prof. Dr. J.Rakovec⁽²⁾, Assist. Prof. T. Vrhovec⁽²⁾, MSc. A. Vidmar⁽¹⁾, MSc. G. Gregori⁽²⁾, M. Šraj⁽¹⁾; University of Ljubljana, Chair of Hydraulics Engineering; email: Mbrilly@fgg.uni-lj.si; <http://ksh.fgg.uni-lj.si/ksh/>; University of Ljubljana, Chair of Meteorology; email: joze.rakovec@uni-lj.si; <http://meteorologija.fiz.uni-lj.si>
- 14:20 **Long Range Forecasting of the Nile River Flows Using Climatic Forcing;** Ahmed K. Eldaw and Jose D. Salas, Department of Civil Engineering, Colorado State University, Fort Collins, CO 80523
- 14:40 **Seasonality of Precipitations and Streamflows in The Martil Basin (North Morocco);** M. Hilali and A. Larabi; LIMEN, Mohammadia School of Engineers 765 Agdal-Rabat Morocco

- 15:00 Mid-afternoon break
- April 5, 2000 15:20 **Special Session in Honor of H. J. Morel-Seytoux**
- Topic: History, contributions and developments in surface and subsurface hydrology at CSU, and challenges and opportunities facing the water resources, hydrologic and environmental science and engineering community in the new millennium.
- Invited Speakers:
- H.J. Morel-Seytoux**, Emeritus Professor, Department of Civil Engineering, Colorado State University
- Maury Albertson**, Emeritus Professor, Department of Civil Engineering, Colorado State University
- Art T. Corey**, Emeritus Professor, Department of Chemical and Bio-resource Engineering, Colorado State University
- David McWhorter**, Professor, Department of Chemical and Bio-resource Engineering, Colorado State University
- Jose D. Salas**, Professor, Department of Civil Engineering, Colorado State University
- David Woolhiser**, Professor, Department of Civil Engineering, Colorado State University
- April 6, 2000 08:00 Registration
- 08:20 **Session Chair: Hubert J. Morel-Seytoux**
Professor Emeritus, Civil Engineering Department
- Room 228 – Lory Student Center**
- 08:20 **Three-Dimensional Analysis of Infiltration from the Disc Infiltrometer;** P.J. Ross; CSIRO, Cunningham Laboratory, University of Queensland, Brisbane, Qld 4072, Australia.; R. Haverkamp; 'Laboratoire d'Etude du Transferts en Hydrologie et Environnement (LTHE/IMG, UJF, CNRS URA 1512), BP 53X, 38041, Grenoble, Cedex 9, France.; J.-Y. Parlange; 'Department of Agricultural and Biological Engineering, Riley-Robb Hall, Cornell University, Ithaca, NY, 14853, USA (Phone: 607-255-2476; Fax: 607-255-4080; E-mail: jp58@cornell.edu); K.R.J. Smettem; Department of Soils, University of Western Australia, WA 6907, Australia
- 08:40 **Coupled and Uncoupled Transport in Porous Media;** A. T. Corey; Professor Emeritus; Department of Chemical and Bioresource Engineering, Colorado State University
- 09:00 **Stochastic Modeling of Immiscible Flow with Moment Equations;** Kenneth D. Jarman; Pacific Northwest National Lab (AMath, TM&S), and; Dept. of Appl. Math, Univ. of Colo., Boulder;
<http://amath.colorado.edu/appm/student/jarman/Home.html>

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- April 6, 2000 09:20 **Solving the Inverse Problem in Groundwater Flow by Iterative Inversion of a Neural Network;** Abdalla Shigidi and Luis Garcia; Department of Civil Engineering, Colorado State University; Department of Chemical and Bioresource Engineering, Colorado State University
- 09:40 **Optimum Utilization of Ground Water Resources in A heavily Exploited Aquifer;** Mr. Salavitabar Mahab Ghods; Consuting Eng.Tehran, Iran; Dr. J. Naji; Assist. Prof. PWITTeheran, Iran
- 10:00 Mid-morning break
- April 6, 2000 10:20 **Session Chair: Darrell Fontane**
Professor, Civil Engineering Department
- Room 228 – Lory Student Center**
- 10:20 **Measuring The Total Economic Value of Restoring Ecosystem Services in The Platte River Basin: Results From A Contingent Valuation Method Survey;** John Loomis, Paula Kent; Dept. of Agricultural and Resource Economics; Colorado State University; Liz Strange, Kurt Fausch, and Alan Covich; Department of Fish and Wildlife Biology; Colorado State University; email: jloomis@ceres.agsci.colostate.edu
- 10:40 **Understanding the Relative Importance of Reservoir Operations and Climate on Reservoir Thermal Conditions;** Laurel Saito, Ph.D., P.E.; Post Doctoral Fellow; Civil Engineering Department; Colorado State University; Fort Collins, CO 80523; 970 491-2801 / 970 491-7727 (fax); lsaito@enr.colostate.edu; Mark Anderson, M.S.; Staff Engineer; TST, Inc. Consulting Engineers; Brett M. Johnson, Ph.D.; Associate Professor; Fishery and Wildlife Biology Department; Colorado State University
- 11:00 **Ground Water- Surface Water Interactions at a Losing Stream: Their Relationship to the Disappearance of Interdunal Wetlands at Great Sand Dunes National Monument, Colorado;** Frederic C. Wurster; Department of Earth Resources, Colorado State University; Colorado State University
- 11:20 **Oceanographic sampling methodology applied to coastal water monitoring;** Michael A. Rozengurt, Ph.D., P.H. and Irwin C. Haydock, Ph.D.; Coastal Consulting, 8888 Laderdale Court, Unit 216 F. Huntington Beach, CA92646; Ph.(714)536-4403.; E-mail: mrozengurt@juno.com.
- 11:40 Adjournment

For Questions or comments regarding
Hydrology Days contact:
hydrologydays@enr.colostate.edu