



Presentations and Publications

Conference Abstracts

- Arrowood, T., M.H. Young, Z. Yu, S. Labahn, and D. Moser, 2007. Fate and Transport of Acrylamide in Soil and Groundwater Systems: Sorption, Retardation and Numerical Simulations. Presented at the Fall AGU Meeting, San Francisco, CA.
- Caldwell, T.G., M.H. Young, J. Zhu, L. Fenstermaker, and E.V. McDonald, 2007. Scaling Heterogeneous Soil Hydraulic Properties Using Canopy/Interspace Distributions in a Mojave Desert Ecosystem. Presented at the Fall AGU Meeting, San Francisco, CA.
- Caldwell, T.G., M.H. Young, J. Zhu, and E.V. McDonald, 2007. Small-Scale Heterogeneity of Soil Hydraulic Properties on Large-Scale Water Balance Simulations. Presented at the Am. Soc. Agron. Meetings, New Orleans, LA.
- Carroll, R.W.H., G.M. Pohll, S. Earman, and R.L. Hershey, 2007. A comparison of groundwater fluxes computed with MODFLOW and a stable isotope mixing model: Application to the eastern Nevada Test Site and vicinity, American Geophysical Union Fall Meeting, San Francisco, CA (EOS, Transactions of the American Geophysical Union, 88(52), H41E-0829).
- Chen, L. and M.C. Stone, 2007. Analysis of Unsteady Sediment Transport Modeling Approaches. Environmental Water Resources Institute-ASCE, Tampa, FL.
- Chen, L., J. Zhu, and M.H. Young, 2007. Polyacrylamide Transport in Water Delivery Canals. Presented at the Fall AGU Meeting, San Francisco, CA.
- Coming, D. and O. Staadt, 2007. Stride Scheduling for Time-Critical Collision Detection. Presented at the ACM Symposium on Virtual Reality Software and Technology in Newport Beach, CA, November 5-7, 2007.
- Conrad, B., D.A. Devitt, M.H. Young, and L. Fenstermaker, 2007. Estimating Sensible Heat in the Great Basin, NV using a Large Aperture Scintillometer. Presented at the Fall AGU Meeting, San Francisco, CA.
- Decker, D.L., S. Earman, R.L. Hershey, J.-H. Ryu, E. Garcia, and P. Reimus, 2007. Reactive transport of ^{14}C through a carbonate aquifer: Implications for contaminant migration, Geological Society of America Annual Meeting, Denver, CO (Geological Society of America Abstracts with Programs, 39(6), 596).
- Dettinger, M. and S. Earman, 2007. Options for monitoring climate-driven recharge changes in Western Mountains, American Geophysical Union Fall Meeting, San Francisco, CA (EOS, Transactions of the American Geophysical Union, 88(52), H14E-01).
- Devitt, D.A., M. Baghzouz, and B. Bird, M.H., 2007. Surface Temperature, Heat Loading and Spectral Reflectance of Artificial Turfgrass. Presented at the Am. Soc. Agron. Meetings, New Orleans, LA.
- Devitt, D.A., B. Bird, and M.H. Young, 2007. Spatial and Temporal Assessment of Soil Moisture Redistribution, Evaporation, and Transpiration. Presented at the Am. Soc. Agron. Meetings, New Orleans, LA.
- Earman, S. and M.D. Dettinger, 2007. Possible impacts of climate change on groundwater and surface water resources in the western U.S.A., Geological Society of America Annual Meeting, Denver, CO (Geological Society of America Abstracts with Programs, 39(6), 524).
- Earman, S., and M. Dettinger, 2007. Climate influences on groundwater recharge: Implications for Western groundwater and surface water resources in the face of climate change, American Geophysical Union Fall Meeting, San Francisco, CA (EOS, Transactions of the American Geophysical Union, 88(52), H14E-04).
- Huntington, J., T. Caldwell, R. Naranjo, S. Burak, and S. Tyler, 2007. Trends in Pan Evaporation and Application of the Complementary Relationship of Evaporation in the Great Basin, USA. AGU Fall Conference.
- Labahn, S., D. Moser, T. Arrowood, and M.H. Young, 2007. Fate of Acrylamide in Soil and Groundwater Systems: Microbial Degradation. Presented at the Fall AGU Meeting, San Francisco, CA.
- Makowski, A., Schumer, R., and D. Boyle, 2007. Volume and flood frequency characteristics of ephemeral streams in the semi-arid U.S. Presented at American Geophysical Union fall meeting, San Francisco, December, 2007.
- Reeves, D.M., 2007. Application of Fractional-Order Governing Equations to Solute Transport in Fractured Rock, Stochastic Transport and Emergent Scaling in Earth-surface Processes Meeting, Incline Village, CA, November 4-7, 2007.
- Reeves, D.M., 2007. Stochastic Simulation of Fracture Networks for Ground Water Flow and Transport Models, Department of Mathematics, Probability and Statistics Seminar, University of Nevada, Reno, November 30, 2007.
- Reeves, D.M., R. Schultz, C. Bingham, K. Pohlmann, C. Russell, and J. Chapman, 2007. Characterization of preferential flowpaths at the T-Tunnel Complex, Rainier Mesa, Nevada, poster at AGU Fall Meeting, December 12, 2007.
- Schultz, R., R. Soliva, H. Fossen, C. Okubo, and D. Reeves, 2007. Displacement-length scaling relations for geologic structural discontinuities and implications for near-tip processes, poster at AGU Fall Meeting, December 10, 2007.
- Yin, J., M.H. Young, and Z. Yu, 2007. Effects of Paleoclimate and Time-Varying Canopy Structures on Paleo-Water Fluxes. Presented at the Fall AGU Meeting, San Francisco, CA.
- Young, M.H., 2007. Measuring Water Content in Near-surface Soils With Large Changes In Ambient Temperature. Presented at the Environmental Sensors Symposium. Boise State University, Boise ID, Oct 26-27, 2007 (Invited).
- Young, M.H., 2007. Groundwater Characterization and Monitoring Strategies II, Presented at the American Nuclear Society Meetings, Washington, DC, Nov 11-15, 2007 (Invited).
- Young, M.H., T.G. Caldwell, J.J. Miller, and G. Dalldorf, 2007. Combining Pedotransfer Functions and Detailed Geomorphic Mapping to Characterize Runoff Potential on an Arid Alluvial Fan Complex. Presented at the Fall AGU Meeting, San Francisco, CA.

- Young, M.H., T.G. Caldwell, and J. Zhu, 2007. Spatial Variability of Soil Hydraulic Properties at Interspace/Canopy Microsites. Presented at the Am. Soc. Agron. Meetings, New Orleans, LA. (Invited)
- Zhang, Y., D.A. Benson, and D.M. Reeves, 2007. Nonlocal transport captured by spatiotemporal fractional derivative models: Modeling approach and field-scale applications, AGU Fall Meeting, December 10, 2007.

Journal Articles

- Hershler, R., H. Liu, and D.W. Sada. 2007. Origin and diversification of the Soldier Meadow springsnails (Hydrobiidae: *Pyrgulopsis*), a species flock in the northwestern Great Basin, United States. *Journal of Molluscan Studies* 73:167-183.
- Meadows, D.G., M.H. Young, E.V. McDonald, 2007. Influence of Surface Age on Infiltration Mechanisms of Desert Pavements, Mojave Desert. *Catena*. 72:169-178.
- Young, M. H., H. Lin, and B. P. Wilcox, 2007. Introduction to special section on Bridging Hydrology, Soil Science, and Ecology. *Hydrogeology and Ecohydrology, Geophys. Res. Lett.*, 34, L24S20, doi:10.1029/2007GL031998.
- Wang, X.-P., M. H. Young, Z. Yu, and Z.-S. Zhang, 2007. Long-term effects of restoration on soil hydraulic properties in revegetation-stabilized desert ecosystems. *Geophys. Res. Lett.* doi:10.1029/2007GL031725.

DHS Reports

- Young, M.H., T.G. Caldwell, J.J. Miller, and G.K. Dalldorf, 2007. Hydraulic Characteristics of Soil Contributing to the Windmill Wash Detention Basin near Bunkerville, Nevada. Desert Research Institute, Division of Hydrologic Sciences Publication No. 41240.
- Russell, C.E., S.A. Mizell, and T.B. Minor, 2007. Estimation of Groundwater Recharge in Steptoe Valley, Nevada, by the Elevation-dependent Chloride Mass-balance Approach. Desert Research Institute, Division of Hydrologic Sciences Publication No. 41241.

DOE Reports

- Oberlander, P., D. McGraw, and C.E. Russell, 2007. Final Report: Hydraulic Conductivity with Depth for Underground Test Area (UGTA) Wells. Desert Research Institute, Division of Hydrologic Sciences Publication No. 45228.

New Projects

NNHP Springs of Biodiversity Significance

PI: Don Sada
Agency: State of Nevada-Dept. of Conservation and Natural Resources
Amount: \$123,453
Summary: This contract is to transfer funds from a State Lands Question 1 grant received by the Nevada Natural Heritage Program (NNHP) to the Desert Research Institute (DRI). A grant under Question 1 was awarded the NNHP on April 30, 2007 to fund a project that will produce a habitat conservation plan for springs of biodiversity significance. The project is intended to advance natural resources conservation objectives of the NNHP, DRI, The Nature Conservancy, and the Nevada Department of Wildlife.

In summary, the DRI, with support of staff and other knowledgeable project personnel, is responsible for fulfilling these tasks: direct spring survey activities; train and advise the spring survey crew in the conduct of surveys; monitor data quality assurance protocol; advises on development of the HCP and interpretation of results; edits the HCP report.

Technical Expertise to SNWA Related to Geochemistry and Isotope Chemistry in Support of Hydrogeological Studies in Eastern Nevada

PI: Jim Thomas
Agency: Southern Nevada Water Authority
Amount: \$130,000
Summary: Provide technical expertise to the Authority related to geochemistry and isotope chemistry in support of hydrogeologic studies in eastern Nevada. Activities include:

1. Evaluate SNWA groundwater budgets using a geochemical and isotope mass balance method.
2. Prepare report documenting the evaluation of SNWA groundwater budgets.
3. Participate in water-right hearings as directed by the Authority, including:
 - a) Prepare hearing documents
 - b) Prepare direct testimony
 - c) Prepare rebuttal documents
4. Travel from Reno to Las Vegas for meetings to discuss the work performed under this Agreement.

Development of a BMP Performance Assessment and Data Analysis System for the Tahoe Integrated Information Management System (TIIMS)

PI: Alan Heyvaert
Agency: USDA Forest Service
Amount: \$285,803
Summary: The main objective of this proposal is to develop the tools needed for consistent and statistically comparable BMP monitoring and assessment. This will build upon preliminary work already in progress for the Tahoe Basin Stormwater Monitoring Network, funded through an EPA grant to the University of California Tahoe Environmental Research Center and the Desert Research Institute. As part of that program, the project team has assembled substantial data on stormwater runoff characteristics at Tahoe and has established preliminary field collection procedures, data management and reporting formats. This proposal will extend that effort to develop a similar set of tools adapted for high resolution BMP performance monitoring and reporting. Furthermore, this proposal will support the integration of those tools directly into the TIIMS EIP/BMP toolkit. This will contribute to the utility of TIIMS as a TMDL load reduction tracking system by providing effectiveness information on individual BMPs as well as load reduction information on a watershed scale. The tools developed here shall help ensure the consistency and quality of results, such that data generated by various agencies, institutions, jurisdictions and consultants will be suitable for direct uploading into the basin-wide TIIMS database.

Tahoe Basin Particle Size Analysis and Protocol Development

PI: Alan Heyvaert
Agency: USDA Forest Service
Amount: \$197,898
Summary: The goal of this proposal is to create uniform, consistent and inter-comparable data base that includes all available data on particle size distribution and composition for Lake Tahoe's streams, urban runoff, the atmosphere and for the lake itself. A secondary goal is to provide guidance for the standardized collection and reporting of all new PSD data by various groups.

Miller, Axline & Sawyer in support of the Saldana Project

PI: Rina Schumer
Agency: Miller, Sher & Sawyer
Amount: \$10,200
Summary: Desert Research Institute will conduct work at the request of Miller Axline, & Sawyer in support of the Saldana project for document review, background research and site visit.

Miller, Axline & Sawyer in support of the Highlands, NY Project

PI: Rina Schumer
Agency: Miller, Sher & Sawyer
Amount: \$9,900
Summary: Desert Research Institute will conduct work at the request of Miller, Axline & Sawyer in support of the Highlands, NY project for document review and deposition preparation.

Evaluation of Fractional Advection-Dispersion Equations for Modeling Flow and Transport in Arid Soils at Various Scales

PI: Rina Schumer
Agency: NSHE - EPSCoR
Amount: \$59,581
Summary: This project will allow us to test the applicability of novel analytical equations to model unsaturated flow and transport at various scales. By designing laboratory-scale experiments to estimate fractional advection-dispersion equation parameters we will evaluate our ability to make flow and transport predictions for arid soils at the field scale.

Cover Test Cell, Phase II Analysis

PI: Brad Lyles
Agency: Energy Solutions
Amount: \$24,000
Summary: Task 1: Soil water content reflectometer (WCR) measurements will be used to compute soil water storage. New calibration coefficients will be applied to the CS615 raw data and temperature data from co-located soil temperature sensors will be used to correct the WCR data.
Task 2: Matrix potential sensor differential temperature data will be used to compute matrix potential. If a suitable release function can be applied, water content will be compared to WCR sensors.
Task 3: Drainage from the test section will be compared to the average soil water storage in the profile and the precipitation at the site.
Task 4: A water balance for the test section will be performed in a spread sheet type calculation, for the period of record.

Tahoe Stormwater Monitoring WY2008 Sample Analyses

PI: Alan Heyvaert
Agency: State of Nevada - NDEP
Amount: \$10,000
Summary: This project will involve the chemical and data analysis of stormwater samples taken during water year 2008 from the Tahoe Stormwater Monitoring Network.

SGER: Development of New Method for Black Carbon Nano-Particles in Seawater

PI: Ross Edwards
Agency: National Science Foundation
Amount: \$73,480
Summary: The objective of this proposal is to develop an analytical method, which essentially counts individual BC nano-particles in seawater and determines their mass rather than making operationally defined determinations of bulk concentration. Based on our previous research with fresh water, we believe that this method can be developed in a matter of months. If we are successful, the new method may finally open up this area of Earth Science to real exploration.

Rosewood Creek Stream Environment Zone Restoration Monitoring: Washoe County, Nevada

PI: Rick Susfalk
Agency: Nevada Tahoe Conservation District
Amount: \$49,957
Summary: This project, funded through the USFS, in conjunction with a recent award by the NDSL-LTLP, will continue our previous efforts of suspended sediment monitoring of the lower Rosewood Creek restoration project that was completed in 2003. In addition, we are expanding our scope to include pre- and post-construction monitoring of the planned 2008 middle reach restoration project by NTCD. This work will provide needed information that can be incorporated into the design of subsequent phases of the restoration project targeting other sections of Rosewood Creek, or to other restoration projects.
The increase in spatial scope requires DRI to operate and conduct sampling at additional monitoring sites, including the routine operation of equipment previously installed by NTCD. In addition, nutrient analyses will be added to the current analysis suite that only includes suspended sediment concentration and particle size.
Lastly, we are proposing to collect more detailed information on water sources to both restoration projects and to several of the restoration features (e.g. spreading zones) within the lower project. Preliminary data has suggested that the effectiveness of these features is dependent on the type and magnitude of hydrologic event. A better understanding of the response of these features under differing hydrologic conditions can be used to improve similar designs for other restoration projects.

New Hires (October - December 2007)

- * Kendall Bell - Hourly scientist working for Alan Heyvaert
- * Karletta Chief - Post Doc working with Michael Young
- * Daniel Coming - Assistant Research Visualization Scientist working with Bill Sherman
- * Peter Lee - Post Doc working with Don Sada

DHS Announcements

Joe McConnell and Ross Edwards' study on soot harming the environment a century ago was listed 19th in Discover's "100 Top Science Stories of 2007"

Proposals (submitted this quarter)

Date	PI(s), CO-PI(s)	Sponsor	Title	Funding (\$)	Fed. Init.
2-Oct-07	Zhang, Yong	Department of Energy	A Fully Lagrangian (Random Walk Particle Tracking) Solver for Nonlocal and Reactive Transport in Heterogeneous Media	372,046	
5-Oct-07	Thomas, Jim	Washoe County	Evaluating the Source(s) and Timing of Recharge to Aquifers of the Alluvial Fans in Southwest Truckee Meadows	88,296	
14-Nov-07	McConnell, Joe	National Science Foundation	Black Carbon, Dust, and Pollution in the High Arctic: Implications for Climate Forcing over Recent Millenia and Beyond	399,090	
28-Nov-07	Heyvaert, Alan	UC Santa Barbara	Stratigraphic and Ecological Analysis of Recent Climate Change and Habitat Alterations in Lake Tahoe using Community Composition of Benthic Chironomidae and Diatoms as Indicators	52,986	
28-Nov-07	Stone, Mark (PI) Earman, Sam	USDA - Forest Service	Impacts of Climate Change on Tahoe Basin Snowpack Hydrology	199,316	
30-Nov-07	Hershey, Ron	USDA - Forest Service	Down-scaling Global Climate Models at Evaluate Potential Impacts to Lake Tahoe Basin-scale Recharge, Runoff, and Ecological Community Distribution	208,930	
3-Dec-07	Zhang, Yong (PI) Chen, Dong Reeves, Matt	Microsoft	RW-FPDE: A Novel Computational Approach for Simulating Non-Fickian Diffusion	88,683	
3-Dec-07	Decker, Dave (PI) Earman, Sam Heyvaert, Alan	USDA - Forest Service	Forest Fire Derived Charcoal Airfall Influence on Lake Tahoe Water Chemistry	323,158	
4-Dec-07	Berli, Markus	USDA - Forest Service	Role of Surface Runoff for Fine Particle and Nutrient Transport from Fire-Affected Soil into Lake Tahoe	131,732	
4-Dec-07	Thomas, James M	USDA - Forest Service	Determining Sources of Highway Runoff Fine Sediment in Stormwater, Streams, and Lake Tahoe using Fingerprinting Techniques	188,448	
4-Dec-07	Berli, Markus	USDA - Forest Service	Treatment BMP Design to Remove Fine Particles from Highway Runoff in the Tahoe Basin	149,975	
4-Dec-07	Zhu, Jianting	National Science Foundation	Collaborative Research: Evaluation of Recharge Models and Groundwater Flowpath under Conceptual Model Uncertainty	129,788	
4-Dec-07	Papelis, Lambis	National Science Foundation	Collaborating Research: Evaluating Solute Transport in Aquifers Using Field, Laboratory, and Numerical Approaches	119,255	
4-Dec-07	McConnell, Joe	National Science Foundation	Black Carbon in Bolivian Snow and Ice: Sources, History and Impacts on Water Supply	342,007	
31-Dec-07	Sada, Don	DOI - Bureau of Land Management	Integrating Groundwater Hydrology and Aquatic Biology to Guide Spring Management	2,378,415	