

Ephemeral Flow

A NEWSLETTER ABOUT SAHRA

2007, no. 1

Welcome to the first 2007 issue of Ephemeral Flow, a newsletter for sharing information within the SAHRA community. Ephemeral Flow is sent to SAHRA researchers, staff, and students at all participating institutions every few months. Your contributions and suggestions are always welcome. Please send items to Mary Black at mblack@sahra.arizona.edu.

FEATURES

What's Up at NMT?

The New Mexico Institute of Mining and Technology, aka NM Tech, has been a principal and very active partner in SAHRA since its inception. In the early years, SAHRA research at New Mexico Tech heavily emphasized hydrological processes in the basin-floor environment that makes up most of the Rio Grande Basin. More recently this emphasis has shifted to the study of runoff from the mountainous areas and the

incorporate mass and energy balance for snowpacks, in order to give tRIBS the capability to simulate runoff from spring snowmelt. **Tafique Mahmood** is setting up tRIBS to model the Jemez River basin, to incorporate the output of the Valles Hydrological Observatory.

Graduate students **Marty Frisbee** and **Ginny Hargrave**, working with **Fred Phillips** (co-leader of SAHRA's Basin Scale Water Balance macro-theme), are



NMT campus

quantification of the salinization of the Rio Grande. In headwaters research, **Alex Rinehart** is wrapping up programming a module for **Enrique Vivoni's** tRIBS precipitation-runoff model that will

using geochemical and isotopic tracers to quantify the subsurface residence time of runoff from the headwaters of the Rio Grande at Saguache Creek in Colorado. This research could not be performed in the Jemez basin because solutes introduced by geothermal discharges masked the tracers. Marty is measuring tracers in both groundwater

and runoff. Ultimately, he intends to use cation concentration changes in the surface water to infer the average subsurface residence time. Ginny is setting up a complementary MODFLOW

UPCOMING EVENTS

March 6-7: SAHRA Executive Committee Planning Retreat, Marshall Building, University of Arizona, Tucson, AZ

March 26-28: UNESCO-IHP Symposium, March 26-28, Westward Look Resort, Tucson, AZ (see Conference Updates)

May 2: SAHRA External Advisory Board meeting, University of Arizona, Tucson, AZ

Aug. 29-Sept. 1: SWH/AHS Symposium, Westin La Paloma Spa and Resort, Tucson, AZ (see Conference Updates)

Oct. 10-12: SAHRA's 7th Annual meeting, Westward Look Resort, Tucson, AZ – SAVE THE DATE!

model to simulate the residence-time distribution in the basin. This research will improve understanding of how the Rio Grande responds to perturbations such as drought and heavy snowfall.

Liz Bastien is the newest SAHRA-supported student to investigate salinization of the Rio Grande, working with Fred Phillips. **Heather Lacey**, who graduated last year (see People section), programmed a PowerSim model of the chloride dynamics of the Rio Grande. Chloride is non-reactive and is the simplest solute to model. Liz is building on Heather's work by compiling all available geochemical data from the Rio Grande to extend the PowerSim model to simulate the geochemical evolution of the reactive solutes in the river basin. This model is intended to help evaluate how perturbations to the local environment (e.g., changes in the amount of agriculture) might affect water quality. This research is complemented by "snapshots" of evapotranspiration over the Rio Grande basin generated from satellite imagery using the SEBAL algorithm by **Sung Ho Hong**, working with **Jan Hendrickx**. This work is leveraged through EPSCoR funding.

GRANTS/LEVERAGING

Things are looking up for SAHRA's appropriation for 2007 from the National Science Foundation. A continuing resolution passed by Congress in Dec. 2006 froze the NSF budget at the FY2006 level through Feb. 15, 2007. Incoming leaders of the new Democratic Congress

initially indicated they would not address or change this FY2007 budget, thereby freezing NSF appropriations at 2006 levels for the remainder of FY2007. Concerted pressure from scientific organizations apparently helped legislators change their minds; a new resolution was introduced

and passed both houses to increase the FY2007 budget six percent over FY2006. What does this mean to SAHRA? Our budget levels will remain within a fraction of a percent of what NSF had promised when it approved SAHRA's proposal for funding for 2005-2009.

CONFERENCE UPDATES

UNESCO-IHP Workshop Slated for March

A UNESCO International Hydrological Programme workshop set for March 26-28 at Westward Look in Tucson is being organized by **David Goodrich**, co-leader of SAHRA's River Systems macro-theme, and co-sponsored by SAHRA. The workshop will focus on methods of detection and analysis of change and feedback in the earth sciences. The event will include speakers from Mexico, France, Ecuador, Switzerland, Germany, and Australia. Alas, participation is by invitation only.

SWH and AHS Join Forces

Planning for the Regional Water Symposium co-sponsored by *Southwest Hydrology* and the Arizona Hydrological Society proceeds apace. The late-August symposium will address "Sustainable Water, Unlimited Growth, Quality of Life: Can We Have It All?" and offer the high-quality technical session presentations of an AHS annual fall symposium. 150 abstracts have been received in addition to 13 proposed sessions, and fundraising is in full swing. **Peter Gleick**, Director of the Pacific Institute, and **Greg Hobbs**, Justice of the Colorado Supreme Court, are plenary speakers. The conference also will offer five optional workshops and three field trips. Rooms at the Westin La Paloma Resort and Spa are exceptionally nice, cheap, and available now! Check it out at www.watersymposium.com. Information on student volunteer opportunities will be available soon.



RESEARCH

Fir Forest Photosynthesis Phenomenon Finds Formidable Following

Constance Brown recently received some valuable publicity for her SAHRA research on how trees manage water in arid environments. Her work demonstrated a strong correlation between soil water availability and photosynthetic activity of the vegetation in a coniferous forest in a sky island of the Southwest, Mt. Bigelow, north of Tucson. Research results showed that the trees' primary growing season is in winter when moisture is more readily and constantly available from rain or snow. In May and June when precipitation is scarce, photosynthetic activity slows markedly, followed by a burst of activity as soon as summer monsoons return in July.

The work was recently highlighted on the research news page of the National Science Foundation, along with physorg.com, the Indiana University

website, in the *Arizona Republic*, and on KJZZ, the NPR station in Phoenix. Although she is now a faculty member at IU, Brown's postdoctoral research was supported by SAHRA and made



Mt. Bigelow tower

possible by the 30-m. high-resolution eddy correlation tower on Bigelow, which was constructed, instrumented, and maintained by a diligent effort from SAHRA research specialist **Jon Petti**. More information on the tower is at www.sahra.arizona.edu/research/TA1/towers/tower_30mEC.html.

PEOPLE

New SAHRA Staff

Although SAHRA lost some dedicated and talented staff members lately to such temptations and distractions as planetary exploration, family commitments, and balmy climates, we are fortunate to have hired outstanding new individuals to fill their places.

Wylie Cox has stepped in to fill the role of SAHRA program coordinator for education. Wylie spent 12 years working as a biologist for various federal and state organizations, half of them in basic cell biology, pathology and electron microscopy, and half doing marine and



terrestrial vertebrate and botanical survey studies in the field. For the last 7 years he has been working in education, mainly at the undergraduate level, where

he helped design, teach, and direct the Earth Semester integrative environmental science program for Columbia University. Wylie's primary interest is

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People, continued

the crafting of meaningful curricula for science students. He “claims the Sonoran Desert as my native habitat.”

Nate Bryant, SAHRA’s new system support analyst at UA, has lived in Tucson off and on since 1981 and for the past 10 years has been a network administrator specializing in Windows-based networks. He will handle most computer-related issues for SAHRA at the UA, and will work with Jim Broermann on projects for the UA Dept. of Hydrology and Water Resources.



James McGill, Systems Analyst/Application Programmer, nurtured his strong interest in computer programming from a young age, and pursued a career in software development. Previously he worked for Tandy Corp, Mobil Oil Exploration, and MindSpring. He is continuing his computer science education at the UA while working



for SAHRA. James’ personal interests include composing and performing music on piano, guitar and electronic instruments; backcountry hiking/camping, and playing with his two dogs.

Annica Polm, secretary to SAHRA Director Jim Shuttleworth, has spent all her life in the desert southwest, most of it in her native Tucson, but including such diverse locations as Moab, Utah, Las Vegas, Nevada, and Pearce, Arizona. Annica is an avid gardener who has recently been studying permaculture and sustainable



water usage, such as water harvesting and gray water usage. Married to her high school sweetheart for almost 20 years, she has three children ranging in ages from 10 to 19, and a menagerie that includes two dogs, a guinea pig, and a betta. She speaks Italian and Spanish and describes herself as an environmentalist and a vegetarian. Annica has worked as a secretary most of her career, taking two years off to work at Starbucks in her “anti-office-work” phase. She claims to still make a mean cup of cappuccino!

Francina Dominguez is a hydrologist specializing in land-atmosphere interactions, who recently received her Ph.D. from the University of Illinois at Urbana-Champaign, with her dissertation focusing on precipitation recycling. At SAHRA, Francina joins the Scenario Team, and will be working on generating high-resolution climate projection forcing data for hydrologic models. Originally from Bogotá, Colombia, she loves the mountains, salsa music, and good coffee.



Judith-anne Yandow (‘Jude’) just began her position as a full-time accountant for SAHRA at UA, and will work on both NSF and non-NSF accounts. (Subcontracting institutions should expect to hear from her on a regular basis!) Jude has worked for the Arizona Area Health Education Centers Program at the University of Arizona Health Sciences Center since 1999 and brings us a wealth of business management and administrative skills. She will work full-time to attempt to fill the shoes of **Angela Oropeza**, who is



leaving to work in the no-less demanding field of full-time mom to infant twins, two toddlers, and two teenagers, and **David Lane**, who recently accepted a position at the Joint Institute for Marine Observations in San Diego. Our best wishes to all!

Pending Loss



We regret to announce the pending departure in March of **Kyle Carpenter**, SAHRA’s senior media specialist, marketing director, and all-around enabler (in the best sense of the word). Since SAHRA’s earliest years, Kyle has given our institution visual presence, panache, even the veneer of competence. He has been in large part responsible for many of SAHRA’s successes, including: SAHRA’s annual meetings from poster and program design to computer troubleshooting; high-profile exhibits at venues such as Sabino Canyon, Kartchner Caverns, and the Phoenix Zoo (forthcoming); artistic direction for *Southwest Hydrology*; and program management for the tri-university Arizona Hydrologic Information System. He is additionally the original mastermind of SAHRA’s alternately beloved and maligned Online Management System. We will miss Kyle’s fine artistic sensibilities, calm demeanor and good will, keen intelligence, and willingness to both tip a cup with friends and muscle a project through to completion. Kyle is following his heart to San Diego and we wish him the very best.

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People, continued

Students who finished Ph.D.s

Heather Lacey, of NMT fame, recently completed her M.S. in earth and environmental sciences at New Mexico Tech, under the mentorship of Fred Phillips. Heather's thesis was titled "Quantification and characterization of chloride sources in the Rio Grande." Following her graduation and in the grand SAHRA tradition, she promptly wed and found a position at an Albuquerque environmental consulting firm, Golder and Associates.

Publicity/Honors

SWH Grabs More Attention

Southwest Hydrology received a regional Award of Excellence in Technical Publications from the Society for Technical Communication in January. In addition, the Jan/Feb 2006 issue on the impacts of climate change on water resources, titled "Inconvenient Hydrology?" attracted considerable attention and acclaim, including a cover shot in no less than three presentations at the annual Colorado Water

Congress in January. Check out *Southwest Hydrology* online or sign up for a free subscription at www.swhydro.arizona.edu.

Content of the "Inconvenient Hydrology?" issue also informed a roundtable climate discussion at UA on February 10, held at the request of Gabrielle Giffords, newly elected congresswoman from southern Arizona, who was selected to serve on the House of Representatives' Committee on Science and Technology. Information on the impacts of climate change in the Southwest was presented by Jonathan Overpeck, UA professor and contributor to the Intergovernmental Panel on Climate Change report released February 2, Tom Swetnam, UA director of tree-ring research, and SAHRA director **Jim Shuttleworth**, who focused on impacts to the regional water supply.

AGU Honors John Wilson

The Hydrologic Sciences Award (formerly the Robert E. Horton Award) of the American Geophysical Union was received by SAHRA collaborator **John Wilson** at

the AGU Fall Meeting in San Francisco in December 2006. The honor is for outstanding contributions to the science of hydrology, and recognizes contributions made over a career, with more weight given to the last five years. Wilson is a professor of hydrology in the NMT Dept. of Earth and Environmental Science, specializing in fluid flow and transport in permeable media, using field and laboratory experiments and mathematical models.

Goodrich Bronzed

Well-deserved congratulations to **Dave Goodrich**, a research scientist for the USDA-ARS Southwest Research Center and co-leader of SAHRA's River Systems macro-theme, for receiving the U.S. EPA Bronze Medal Award last October. The award is the highest that can be achieved within the EPA Office of Research and Development. Goodrich was recognized for "superior performance in developing, applying and providing innovative watershed analysis tools to the public, regulatory, and scientific communities."

R&R

Wedding Bells for SAHRA Students

We all knew that SAHRA students were enchanting and irresistible; now we have scientific proof! Since last spring, a statistically significant number of recent or soon-to-be graduates have tied the knot, with one couple (Matt and Alison) forming a dual SAHRA match. Congratulations and best wishes to all.



Candice Marburger (UA) & Kevin Rupprecht



Kristin Green (UA) & Pat Sinnott



Heather Lacey (NMT) & Mr. Hallet



Alison Williams (UA/Sandia) & Matt Baillie (UA/NMT)