

Ephemeral Flow

A NEWSLETTER ABOUT SAHRA

SEPTEMBER 2005

Welcome to the September 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 approximately every two months. Your contributions and suggestions are always welcome. Please send items to Mary Black at mblack@sahra.arizona.edu.

FEATURE

SAHRA 5th Annual Meeting, Register Now Online.

SAHRA's 5th Annual Meeting will be held this year from **October 26-29** at the Radisson Hotel City Center in downtown Tucson. This annual event brings together SAHRA participants from 13 academic institutions and numerous government agencies to renew acquaintances and discuss research and plans for the coming year. Wednesday will be the meeting's plenary day, providing an overview of SAHRA accomplishments for stakeholders from numerous organizations and agencies and an opportunity to learn more about stakeholder needs and interests. Thursday and Friday will be devoted to investigator and student reports, workshops, and group meetings. All students actively undertaking research are expected to share a poster related to their work. Poster abstracts are due **October 10th**; guidelines are posted on the website.



Everyone attending must register via the SAHRA website at www.sahra.arizona.edu/. Click on the button marked "5th Annual Meeting" and register away. Optional activities include a stakeholder engagement training workshop on Friday, and a choice of three field trips (Santa Catalina Mountains, Kartchner Caverns State Park, or mountain biking). Some activities have limitations on the number of participants, so please register NOW!

FIELD NOTES

News from the NM Towers and Transect

Basin-Scale Water Balance macro-theme participants from UA, CU, NMT, UNM, PSU, LANL, and DRI spent much of the summer working in the Valles Caldera National Preserve (www.vallescaldera.gov) in northern New Mexico. The large and diverse team represented hydrologic and ecological expertise ranging from land-atmosphere dynamics to GW modeling (and all points in between) in a

coordinated effort to identify the effects of vegetation on water balance. The sites in NM range from 8,700 to 10,000 feet and represent the vegetation types found at the higher elevations that are the primary water sources for streamflow and groundwater recharge in semi-arid catchments. The experimental design involved developing high-resolution spatial and temporal data collection at specific locations surrounded by distributed data collection efforts at larger spatial and temporal scales.

UPCOMING EVENTS

Meetings, Workshops, Seminars, Short Courses

Sept. 21-24: Arizona Hydrological Society Symposium, Flagstaff (details at www.azhydrosoc.org/symposia.html)

Oct. 10: Deadline for poster abstracts for SAHRA's Annual Meeting

Oct. 26-28: SAHRA's 5th Annual Meeting and NSF Site Visit, Tucson

CONTACT US!

Please let us know when you have news to share or a reason to brag. Students, let us know for example when you have completed your oral exam, defended your thesis/dissertation, or accepted a position in the real world (or even academia). Faculty members, are you offering a new course, hosting a workshop, leading a panel, editing a new journal? Too bashful to talk about your own accomplishments? Anonymous or second-party tips on newsworthy announcements are also gratefully accepted.

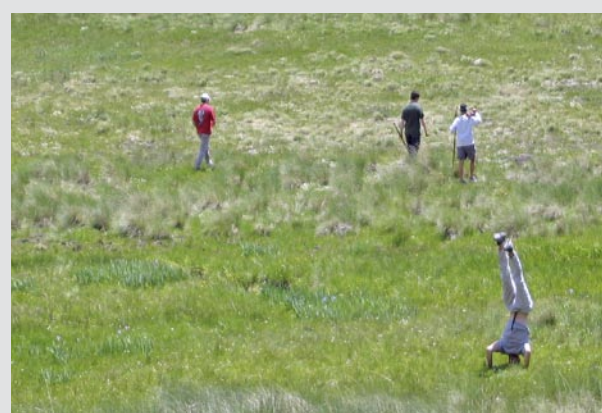
Accomplishments included:

- construction of two eddy covariance towers
- establishment of three stream gauges
- installation of six piezometers, 16 sap flow sensors, and over 100 soil-moisture and soil-water-potential probes
- collection of hundreds of stream-, soil-, and ground-water samples
- completion of three synoptic stream surveys

continued on next page

Field Notes, continued from previous page

- a two-week long soil moisture and micrometeorological campaign (see below)
- excavation of multiple soil pits
- collection of ~75 soil samples for soil hydraulic properties
- 20 trees harvested for biomass measurement
- sampling of soils, litter, and vegetation for biogeochemical and isotopic characterization
- and an eagle in a spruce tree (sighted).



Eric Small demonstrates a new technique for estimating soil moisture to skeptical students.

All measurements were located in a nested design with each other and with snow sensor/snow survey data obtained the previous winter. Together these field facilities will provide the information needed to address SAHRA's integrating question "What are the impacts of vegetation change on basin-scale water balance?" Over the next several years the resulting field facility will provide the most complete data set for ecohydrological interactions in the western United States.

Valles Caldera Field Campaign

As part of SAHRA's ongoing basin-scale studies of semi-arid hydrology, faculty and students from NMT, UA, MIT and UCLA

carried out a spatially extensive field campaign in the Valles Caldera of northern New Mexico from July 20-August 2, 2005. The campaign sampled the surface hydrologic and atmospheric conditions during the North American Monsoon season in a region of complex topography and sharp changes in vegetation. Seventy-two sites were sampled daily for rainfall, soil moisture, soil temperature and meteorological variables such as air temperature and relative humidity. Four two-person teams conducted the study at sampling sites in Redondo Creek, Jaramillo Creek, and the Valles Grande. The comprehensive data set will be used to understand the spatial and temporal coupling between the land surface and atmosphere during the summer monsoon; to test and verify the predictions of a fine-resolution distributed hydrologic

model applied to the region; and to understand the controls of vegetation on the summer hydrological cycle in the Rio Grande basin. Funding was provided by the New Mexico Water Resources Research Institute, SAHRA, and the National Science Foundation. Alex Rinehart, a master's student at NMT, and Prof. Enrique Vivoni organized and led the campaign.

Partner Institution Highlight: Penn State

Chris Duffy's research team at Penn State University has been productively toiling away on SAHRA-related research:

An integrated hydrologic model

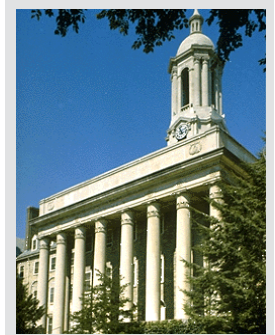
developed by

Yizhong Qu, who received his Ph.D. in May, is in testing mode and soon will be available on SAHRA's Hydroarchive website (www.sahra.arizona.edu/software/). The model uses a semi-discrete finite volume approach for multi-process simulation.

Peter Beeson, a second-year Ph.D. candidate partially funded on SAHRA and NASA projects, spent the summer working on the Rio Salado in the Sevilleta LTER. His research focuses on developing integrated models for forecasting streamflow in ungauged basins.

Ph.D. candidate **Mukesh Kumar** is working on a remote sensing strategy for automatic detection of flowing ephemeral stream reaches using ASTER remote sensing images. His research is funded by a SAHRA-leveraged NASA project paper.

A recent paper by **Chris Duffy** in *Groundwater Recharge in a Desert Environment: The Southwestern United States* (edited by SAHRA scientists James Hogan and Fred Phillips, and Bridget Scanlon) caused quite a stir in the media as it speculated about the importance of mountains in sustaining mountain-front groundwater levels and long-term baseflow conditions to the Rio Grande. Chris was interviewed for articles by El Paso, Albuquerque, Sante Fe and several other newspapers, as well as *Geotimes*. The article was also featured on the NSF website as a SAHRA research accomplishment.



Old Main at Penn State.
Credit: Penn State Alumni Association



Ah, the rigors of field work! A group dinner at Los Ojos Restaurant in Jemez Spring, NM, during the Valles Caldera Field Campaign. From left: Carlos Aragon (NMT), Bill Tai (NMT), James Hogan (UA), Sung-ho Hong (NMT), Emily Engle (NMT), Marty Frisbee (NMTech), Bart Forman (UCLA), Gautam Bisht (MIT), and Prof. Enrique Vivoni (NMT).

PEOPLE

New SAHRA Students for 2005/06

We have a few details to share about new students at the University of Arizona. Unfortunately, we know very little about new students at our partner institutions. If you are a non-UA PI who has a new student working on a SAHRA project, please get in touch!

Helena Mosser is a new student in the M.Eng. program in the Hydrology and Water Resources (HWR) program. Helena received a bachelor's degree in civil engineering from Bradley University in Peoria, IL, in 2001 and has been working for the Missouri office of the Army Corps of Engineers in Kansas City, MO, as a hydraulic engineer, working primarily on flood control projects in Missouri and Kansas. Newly wed in January, she is joined in Tucson this semester by her husband, Adam, who is in training to be a pastor.

Samantha Treese received a B.A. in history and archaeology from Wesleyan University in Connecticut. She will be TA'ing Jim Washburne's course, Arizona Water Issues, and working with him in an area to be determined, possibly international policy.

SAHRA welcomes **Celso Moller Ferreira** for Fall semester from his home institution, Federal University of Santa Catarina, located on the island of Florianopolis, Brazil, off the southern Brazilian coast. Celso will be working with Juan Valdés, Kevin Lansley, and Anne Browning-Aiken on a decision-support model of the Upper San Pedro Basin and participating in community meetings on water issues related to the basin. Celso is working on a master's thesis in environmental engineering that focuses on developing methods to support the determination of water use rights according to new Brazilian water law.

Guillermo Ponce is a master's student in the Dept. of Soil, Water, and Environmental Science, studying remote sensing with Alfredo Huete. Guillermo's bachelor's

degree is in information systems engineering from Instituto Tecnológico de Estudios Superiores de Monterrey, Mexico. He will be working on making Arizona well data from multiple agencies accessible on the Internet.

Fresh from receiving a B.S. in 2005 in earth systems at Cornell University, **Andrew Neal** is working on an M.S. degree in HWR with Hoshin Gupta, focusing on modeling and data assimilation/analysis.

Working with Tom Meixner on master's degrees in HWR are new students **Scott Simpson** and **Carlos Soto-López**. Scott has a B.A. in environmental sciences from the University of Virginia and will be studying the impacts of land use on groundwater quality. Carlos has a B.S. in environmental sciences from the Rio Piedras campus of the University of Puerto Rico, and will be working in the area of surface hydrology and biogeochemistry, with the ultimate goal of receiving a Ph.D. in hydrology.

Staff News

SAHRA's Education macro-theme has a new and enthusiastic representative in the form of **Carla Bitter**. Carla has a B.A. in anthropology from West Virginia University and recently received an M.S. in life sciences from the University of Maryland. Her previous professional positions include exhibit programs manager at the California Science Center in Los Angeles and area coordinator of the Arizona Science Center. Carla will be working on a variety of K-12 education projects and informal education projects, including the new Water Planet exhibit described in the Summer 2005 issue of *Ephemeral Flow*.

Students Who Finished Degrees in Summer 2005

From the Frying Pan into the Ice Maker?

Josh Koch, late of UA-HWR fame, finished his M.S. in July and has gone off to seek a Ph.D. in environmental engineering at the University of Colorado. Josh survived a drought-ravaged San Pedro

field season in 2004 just sufficiently to eke out data for his thesis, "Quantifying bulk and mobile carbon and nitrogen in the dominant landscapes of the Upper San Pedro River Basin." He fled to the Institute of Alpine and Arctic Research (INSTAAR) in Boulder and will be undertaking research in Antarctica from late October until mid-January 2006.

Another One or Two Bite Escape the Dust

Having completed his M.S. in HWR in August, **Arun Wahi** has also abandoned Tucson, in this case for the Albuquerque office of consulting firm D.B. Stephens. Arun's thesis was "Quantifying mountain system recharge in the Upper San Pedro Basin, Arizona, using geochemical tracers." Brenda Ekwurzel and James Hogan were his primary advisors.

In August, **Jacob Davis** completed his M.S. thesis, "Arsenic in Arizona: Assessing the economic cost and hydrogeologic feasibility of nontreatment options." Jacob is now working for the Dept. of Natural Resources for the state of Montana on water rights adjudication issues. His advisors were Steve Stewart and James Hogan.

Publicity/Honors

Kudos to the UA's Masters in Engineering program, which was honored at the Universities Council on Water Resources meeting July 11-14 in Portland, Maine, with UCOWR's Education and Public Service Award in Water Resources. Developed for the Army Corps of Engineers by **Don Davis** of the Dept. of Hydrology and Water Resources and **Gary Woodard**, SAHRA's associate director for knowledge transfer, this interdisciplinary degree program has expanded to serve mid-career professionals regardless of their employing agency, allowing them to update their skills and knowledge of new techniques and issues in water resource management. The program requires a residency at the UA for only one semester, then allows students to return to their workplace to finish classwork and complete a project that is relevant to their agency or department, in lieu of a thesis.

IN BRIEF

CLIMAS Newsletter

CLIMAS Update, a bi-annual newsletter about the research and outreach activities of the NOAA-funded, UA-based Climate Assessment for the Southwest, is going to an electronic-only format. Beginning with the Fall 2005 issue, *CLIMAS Update* will be in PDF format on the CLIMAS website at www.ispe.arizona.edu/climas/pubs.html#newsletter. To receive emails announcing new releases, sign up at www.ispe.arizona.edu/climas/subscribe.html

Raging Santa Cruz

Monsoon flows of 17,000 cfs on August 23 caused the normally dry Santa Cruz River to crest at more than 12 feet in the Tucson area, the fourth-greatest stream flow recorded for the river by the USGS since it began collecting data in 1915. River rat and extreme photographer Matt Weber captured this photo at its peak.



ANNOUNCEMENTS



Baby News

Enrique Vivoni's family has expanded with the birth of **Maria Camila Vivoni Felix**, born in Albuquerque at the inconvenient hour of 5:57 am on August 3rd. Maria Camila was anxious to join the world, arriving 5 weeks early and packing 4 pounds, 13 ounces. Mother Amapola Vivoni, Enrique, and baby are doing fine.

Maria Camila slumbers on Day 3 on Earth.

R & R

What I Did on My Summer Vacation

Deirdre Brosnihan combined her scholarly and recreational interests this summer, using a scholarship from Birthright Israel to travel to the Middle East. Deirdre went on a 10-day outdoor/hiking trip which allowed her to ride camels, hike ancient water tunnels, climb Massada, float in the Dead Sea, kayak the Jordan River, swim in a 10-meter high waterfall near the Syria border, and trek through the Negev Desert.



A view of the Dead Sea at sunrise from the top of Massada (an ancient desert mountain fortress) (top) and Deirdre reveling in the Dead Sea (bottom).

CROSSWORD PUZZLE...

BE SURE TO CHECK OUT THE CROSSWORD PUZZLE ON THE NEXT PAGE!

Crossword Puzzle

ACROSS

1. What some grad students become when they finish their studies.
5. *Initials of a co-author of a Science paper by Walvoord, et al.
8. *Wolfgang Schmid recently received it.
11. Throw in the towel.
15. Leave hastily, or a type of jazz singing.
16. Consume.
17. A substance obtained by leaching.
18. *Home of NCAR, and a sponsor of SAHRA's 2nd Intl Symp. on Transboundary Waters Management
19. WWII battle site in France.
20. Santa ___ winds.
21. A hydro-related org They'll meet in Jan. in Atlanta.
22. Robert of Civil War fame.
23. *A satellite-based precip measurement algorithm.
26. Country-western/TV star Chris.
27. *SAHRA Ph.D. student from España.
30. *Source of SAHRA funds in Arizona, courtesy of Prop 301.
31. Superlative suffix.
32. Narrow inlet of the sea; the Forth is one.
33. Part of the EU.
34. Deriving from the continent south of 33 Across.
38. *The division of USDA that includes SWRC.
39. Senior citizen's interest group.
41. Park your posterior.
42. Portuguese gold.
43. Tell on.
44. *An REU is one.
45. An emphatic denial, to an adolescent.
46. Being broadcast as we speak.
47. *A SAHRA-collaborating inst.
48. One type has wrinkled genes.
49. A tool for modern hikers.
50. Chance to get an RBl.
53. Stitch.
54. Car-maker org., or a frat founded in 1856.
55. *Belonging to a Riparian Systems MT leader.
58. What you might smell on occasion.
59. Variety of reggae.
60. A Hershey's toffee bar.
61. Yale student.
62. 1 runs north-south along the CA coast.

64. Fluffy scarf, and the undoing of Isadora Duncan.
65. Talk off the cuff.
67. A venerable multi-volume language resource.
68. Treaty.
69. *A rainfall/runoff model developed at MIT by Vivoni and others.
70. *One that measures streamflow is linked to SAHRA's Sabino Canyon website.
73. A Chinese beverage.
75. Celtic language.
76. Ltd. equivalent, in the U.S.A.
77. Pioneering movie studio that produced Citizen Kane.
78. Variety of soda.
82. *van Genuchten, a SAHRA collaborator at the U.S. Salinity Lab.
83. *Grande or Bravo, for instance.
84. Abbv. for the cheapest type of gas.
85. *Fed. agency that collaborates with SAHRA on DRI precip work and Rio Grande salinity studies, among other projects
86. Advanced degrees in education.
87. Part of Q&A.
88. Yiddish exclamations of dismay.
89. Take a covert look.

DOWN

1. *One has been released to the USPP, focusing on riparian management.
2. *Mo. in which SAHRA's annual meeting will be held.
3. One of the Lower Colorado Basin states (abbr.)
4. Cut it out!
5. Hind part.
6. *A featured author in the Sept./Oct. *Southwest Hydrology* and current chair of the Good Neighbor Environmental Board
7. One way to ascend.
8. What to try if your first 5 attempts fail.
9. Song of praise.
10. ___ Moines.
11. *Three of them at SAHRA integrate.
12. *Collaborator Terri Hogue is based at this univ.
13. *An intl. group with which SAHRA is collaborating on Rio Grande salinity work with isotopic tracers.
14. Lance's bike.

by Mary Black

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Solution at www.sahra.arizona.edu/newsletter/

24. A car's contribution to global warming, some say.
25. It's colorless, odorless, tasteless, and as essential as water.
26. Country working on a roadmap to peace with Palest.
27. At a good distance.
28. A currency displaced by the Euro.
29. At a previous time, once.
31. A young newt (not Gingrich).
34. Small island.
35. Its headquarters is the "George Bush Center for Intelligence."
36. *Michelson, of Southwest Hydrology Advisory Board fame.
37. Partner of neither.
40. *Org. that hosts an annual Dec. "Fall Meeting," often attended by SAHRA participants.
41. Offspring.
45. Innovative.
46. Run.
47. *Featured topic of *Southwest Hydrology*, v.3, no. 6.
48. This is mightier than the sword.
49. *UC Irvine collaborator, and PI of Integrated Modeling project M01.
50. Exclamation heard in Tucson on the arrival of the first monsoon rain.
51. Prefix meaning three.
52. Slang term for baseball base.
53. Realm of the clouds.
54. Tool used by ancient roller skaters.
55. Where to buy your BLT.
56. Stated with fluency but perhaps also insincerity.
57. Bro and sis.
59. Sorrowful.
60. *Home of New Mexico Tech.
63. Tiny.
64. File extension for some backup files.
66. *An early SAHRA collaborator from UC-Berkeley on Rio Grande drought analysis.
68. *A tributary to the Rio Grande.
70. Screen actor Richard.
71. *The SAHRA focus is on this and semi-such lands.
72. Took advantage of.
73. A novel by Nabokov.
74. Duds.
76. Type of investment acct.
79. Carbohydrate suffix.
80. T-shirt size.
81. What good students do if they don't understand.

*A little research on the SAHRA website (www.sahra.arizona.edu) should help you with these clues.