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Issue 19

The semi-annual Unsaturated Zone Interest Group (UZIG) newsletter highlights current topics concerning the unsaturated zone. Its purpose is to enhance communication within UZIG. It is not an official publication and should not be cited. Please contact authors or members of the newsletter committee with any questions, comments, and/or suggestions. Send desired changes in the mailing list to jtrost@usgs.gov.

Visit the website

mn.water.usgs.gov/uzig/

2017 UZIG Meeting

(click [here](#) or see page 3 for more details)

Newsletter Committee

Amanda Garcia, USGS, NV
Wes Henson, USGS, NV
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Fall 2016 Newsletter

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e-mail uzig.news@gmail.com

Letter from the UZIG Chair: Communication is Key

By Jared Trost
USGS Hydrologist
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“Well, it’s been a quiet week in Lake Wobegon, Minnesota, my hometown, out there on the edge of the prairie.” Being from Minnesota, I couldn’t resist the temptation to start with the phrase so commonly heard on a local favorite radio program, *A Prairie Home Companion*. I use it to emphasize the opposite point, that the UZIG steering committee has been anything but quiet. Many events are being planned and coordinated by the steering committee that will provide opportunities for communication among unsaturated zone scientists. This newsletter highlights upcoming webinars, conference sessions, and a stand-alone UZIG meeting set for March, 2017 in Gainesville Florida. I encourage you to read more about these events in this issue and put some placeholders in your calendars!

As chair, I facilitate communication and coordination among unsaturated zone scientists, and would like to encourage greater communication among the 400+ members of UZIG. Looking back, each of us has had



Jared Trost: 2015-2016 UZIG Chair.

different experiences with field and modeling studies. Looking ahead, each of us is faced with the challenge of identifying new collaborators and methods appropriate for new investigations. Our collective experiences are invaluable as we evaluate the ever-increasing number of data collection, processing, and modeling platforms, from Raspberry Pi to MODFLOW.

Article continued on page 2.

Banner photo (top): Tufa mound north of a 44,000-acre playa in northern Dixie Valley, north-central Nevada. *Photo by Amanda Garcia, U.S. Geological Survey.*
Submit a photo to uzig.news@gmail.com to be featured in the newsletter.

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By Jared Trost
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jtrost@usgs.gov

Article continued from front page.

To support greater communication, UZIG has established a listserv dedicated for communication among all members. To date, most communication has been from the steering committee to the rest of the membership. I encourage you to initiate a conversation thread about an unsaturated-zone topic of interest to you or announce a position opening. You can post by sending an email to UZIG-L@LISTS.UFL.EDU or by logging in and posting a message here: <https://lists.ufl.edu/cgi-bin/wa?A0=UZIG-L>.

The listserv currently is set up to deliver daily index digests to minimize your inbox clutter. Unless you've

changed your settings, you will receive no more than one email per day that lists emails by sender and subject. If you want the full text of any message posted to the listserv, simply reply to the index message, containing at least one or more 6-digit index numbers, and the full message(s) will be sent to you. Alternatively, you can visit the page <https://lists.ufl.edu/cgi-bin/wa?A0=UZIG-L>, to view or post conversation threads.

In closing, I look forward to future discussions with the UZIG membership. I also want to express my sincere thanks to members of the steering committee and others who are making so many great UZIG events happen.

Sincerely,

Jared

UZIG Web Seminar Series – Recent and Upcoming

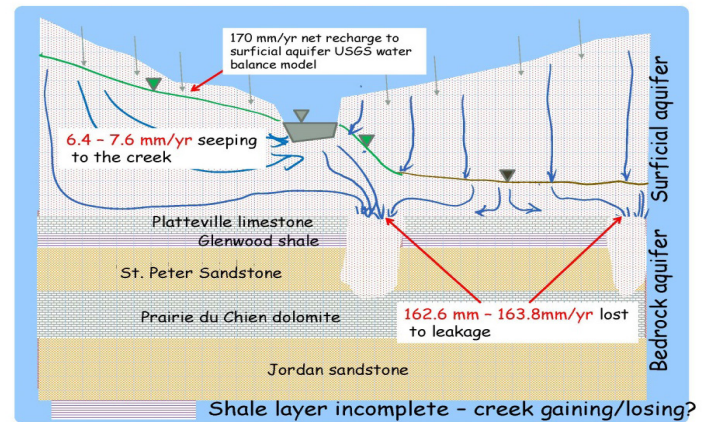
By John Nimmo
USGS Research Physicist
jrnimmo@usgs.gov

The UZIG webinar series provides real-time presentations of cutting-edge unsaturated zone science to UZIG members and anyone who accesses it through the web. In 2016, the series continues with a new coordinator, Kim Perkins, USGS hydrologist based in Menlo Park, CA. She follows USGS Hydrologist Mindy Erickson, who brought the webinar series into existence in 2013, established its format and implementation on the web, and organized and hosted the webinars through 2015, when her term as coordinator ended.

The webinar series provides an easily-accessible forum for UZIG members to introduce themselves and share their research results. Especially important in this time of restricted conference attendance, the series provides a way to maintain personal connections with other scientists, and keep up with current research. Past and future webinar information is on the webinar series web page: <http://mn.water.usgs.gov/uzig/webinars.htm>.

Anyone who would like to present research at an upcoming webinar, or who has a suggestion for possible presenters or topics, should contact Kim Perkins (kperkins@usgs.gov).

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Grassland

Forest



Each site hand-operated with a flow meter to ensure delivery of the correct volume

Highlights from recent webinars: Illustrations of the hydrogeologic flow system of Minnehaha Creek (John Nieber) and artificial infiltration experiments on degraded grassland and restored forest in Hawaii (Kim Perkins)

UZIG Web Seminar Series – Recent and Upcoming

By John Nimmo
USGS Research Physicist
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Recent Webinars:

May 2015

“Minnehaha Creek, Minnesota; Sources for baseflow and causes for losing reaches.”

John Nieber, University of Minnesota

September 2015

“Infiltration in Hawaiian soils: An evaluation of vegetation influences”

Kim Perkins, USGS

November 2015

“How to choose solution methods for saturation-dependent flow and transport problems: Critical-path analysis, percolation scaling, or effective-medium formulations?”

Allen Hunt, Wright State University

Upcoming Webinars:

March

Date March 9, 2016 Noon Central Time (17:00 UT)

“Using soil-water dynamics models to examine shallow groundwater recharge patterns through soils formed in glacial parent materials”

Shawn Naylor, Center for Geospatial Data Analysis and Indiana Geological Survey

April

Date April 28, 2016 Noon Central Time (17:00 UT)

“Subsurface heat production due to microbial activity at a crude oil-contaminated site”

Ean Warren, USGS

September

Date TBD, Sept. 2016 Noon Central Time (17:00 UT)

“Model predictions of water runoff in steep catchments after wildfire”

Francis Rengers, USGS

2017 UZIG Meeting at the University of Florida

By Amanda Garcia and Wesley Hensen
USGS Hydrologists
cgarcia@usgs.gov and whenson@usgs.gov

We are planning our next UZIG meeting for the Spring of 2017. The meeting, a 3-day stand-alone event at the University of Florida (UF) in Gainesville, is tentatively scheduled for March 13-15. The total per-person meeting cost is estimated at \$100. The three-day meeting will consist of 2 days (total) of oral and poster sessions split around a full-day field trip.

As with previous UZIG meetings, we anticipate publication of collections of peer-reviewed research

papers (in journals such as J. Hydrology-Regional Studies and Vadose Zone Journal) from selected papers presented in Gainesville.

Please respond to this poll by March 25 with your level of interest in attending to provide a general head-count for planning purposes. Feel free to offer ideas and feedback in the poll’s comments section. Thanks! Details about poll results and meeting activities will be included in the next newsletter (Sept. 2016).

<http://goo.gl/forms/JGekZfu1i0>

Featured Publications

By Andy O'Reilly
University of Mississippi
aoreilly@olemiss.edu

“Featured Publications” highlights recently published work (for example, an article, book, or technical report) of UZIG members. The guidelines for listing of a publication are as follows:

- At least one of the authors or coauthors must be a UZIG member
- Publication must have been published in the last two years
- Content must be directly related to unsaturated-zone research topics
- Only the publication citation is listed (no reviews or other comments)
- Citations are listed in alphabetical order by first author's last name

Please email Andy O'Reilly (aoreilly@olemiss.edu) any citations for your work meeting these criteria that you would like to be included in an upcoming newsletter.

Andraski, B.J., Jackson, W.A., Welborn, T.L., Böhlke, J.K., Sevanthi, R., and Stonestrom, D.A., 2014, Soil, plant, and terrain effects on natural perchlorate distribution in a desert landscape: *Journal of Environmental Quality*, v. 43, no. 3, p. 980-994, <http://dx.doi.org/10.2134/jeq2013.11.0453>.

Garcia, C.A., Huntington, J.M., Buto, S.G., Moreo, M.T., Smith, J.L., and Andraski, B.J., 2015, Groundwater discharge by evapotranspiration, Dixie Valley, west-central Nevada, March 2009–September 2011 (ver. 1.1, April 2015): U.S. Geological Survey Professional Paper 1805, 90 p., <http://dx.doi.org/10.3133/pp1805>.

Green, C.T., Walvoord, M.A., Andraski, B.J., Striegl, R.G., and Stonestrom, D.A., 2015, Multimodel analysis of anisotropic diffusive tracer-gas transport in a deep arid unsaturated zone: *Water Resources Research*, v. 51, p. 1-22, <https://dx.doi.org/10.1002/2014WR016055>.

Hooper, D.M., and Dinwiddie, C.L., 2014, Debris flow of the Great Kobuk Sand Dunes, Alaska: *Implications for analogous processes on Mars: Icarus*, v. 230, p. 15–28, <http://dx.doi.org/10.1016/j.icarus.2013.07.006>.

Meixner, T., Manning, A.H., Stonestrom, D.A., Allen, D.M., Ajami, H., Blasch, K.W., Brookfield, A.E., Castro, C.L., Clark, J.F., Gochis, D.J., Flint, A.L., Neff, K.L., Niraula, R., Rodell, M., Scanlon, B.R., Singha, K., and Walvoord, M.A., 2016, Implications of projected climate change for groundwater recharge in the western United States: *Journal of Hydrology*, v. 534, p. 124-138, <https://dx.doi.org/10.1016/j.jhydrol.2015.12.027>.

Mirus, B.B., 2015. Evaluating the importance of characterizing soil structure and horizons in parameterizing a hydrologic process model: *Hydrological Processes*, v. 29, no. 21, p. 4611–4623, <http://dx.doi.org/10.1002/hyp.10592>.

Nimmo, J.R., 2015, Preferential Flow—Stokes Approach to Infiltration and Drainage [Book review]: *Vadose Zone Journal*, v. 14, no. 7, <http://dx.doi.org/10.2136/vzj2015.03.0040br>.

Nimmo, J.R., Horowitz, C., and Mitchell, L., 2015, Discrete-storm water-table fluctuation method to estimate episodic recharge: *Groundwater*, v. 53, no. 2, <http://dx.doi.org/10.1111/gwat.12177>.

Nimmo, J.R., and Malek-Mohammadi, S., 2015, Quantifying Water Flow and Retention in an Unsaturated Fracture-Facial Domain, in Faybishenko, B., Benson, S.M., and Gale, J.E., eds., *Dynamics of Fluids and Transport in Fractured Porous Systems*, Geophysical Monograph 210, AGU (Wiley), p. 169-179, <http://dx.doi.org/10.1002/9781118877517.ch12>.

Article continued on page 5.

Featured Publications

By Andy O'Reilly
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aoreilly@olemiss.edu

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Perkins, K.S., Mirus, B.B., and Johnson, B.D., 2014, Measurement of unsaturated hydraulic properties and evaluation of property-transfer models for deep sedimentary interbeds, Idaho National Laboratory, Idaho: U.S. Geological Survey Scientific Investigations Report 2014–5206, 16 p, <http://dx.doi.org/10.3133/sir20145206>.

Perkins, K.S., Nimmo, J.R., Medeiros, A.C., Szutu, D.J., and

von Allmen, E., 2014, Assessing effects of native forest restoration on soils moisture dynamics and potential aquifer recharge, Auwahi, Maui, *Ecohydrology*, v. 7, no. 5, <http://dx.doi.org/10.1002/eco.1469>.

Tashie, A.M., Mirus, B.B., Pavelsky, T.M., 2015.

Identifying long term empirical relationships between storm characteristics and episodic groundwater recharge: *Water Resources Research*, v. 52,

Unsaturated-Zone Session at the USGS National Groundwater Workshop

By Amanda Garcia and Jared Trost
USGS Hydrologists
cgarcia@usgs.gov and jtrost@usgs.gov

UZIG members have proposed an unsaturated-zone focused parallel session at this summer's USGS National Groundwater workshop. The workshop will be held August 29 - September 2, 2016 at the Peppermill Resort and Casino in Reno, Nevada. In addition to the parallel session, UZIG members also have suggested unsaturated-zone focused training sessions including modeling and instrumentation. Please contact Amanda Garcia or Melinda Chapman (mjchap@usgs.gov) for more information about this workshop.

Title:

Advances in the theory, characterization, and modeling of unsaturated zone processes

Brief description:

This session focuses on improving the understanding of unsaturated zone processes controlling gas and water transport—through field and laboratory measurements, theoretical and numerical models, and other characterization techniques. All topics are welcome, including recharge, infiltration, land-use and climate change, soil-plant-atmosphere interactions, and contaminant fate and transport. This session will be followed by a discussion on managing unsaturated zone data.

Session rationale:

From arid to humid environments, unsaturated-zone processes control gas and water movement between the land surface and aquifer. As a result, large-scale problems of water quality and availability, land-use, and impacts of climate change require knowledge of unsaturated-zone dynamics. Unsaturated zone properties and processes control infiltration, aquifer recharge, and evapotranspiration rates, and can largely affect the partitioning and redistribution of natural and anthropogenically-derived liquid and gas-phase chemical constituents in the subsurface and atmosphere. An improved understanding of flow, diffusion, and reaction of gas and water through innovative sampling techniques, field and laboratory measurements, and numerical modeling can help guide current and future unsaturated zone studies. This session solicits contributions highlighting recent advancements in field and laboratory measurements, theoretical and numerical models, and other characterization techniques that improve the understanding of gas and water transport across the groundwater to atmosphere continuum.

Unsaturated-zone studies often generate large comprehensive datasets, but USGS data-management procedures are ambiguous with regard to unsaturated-zone data. Although water-science centers are tasked with quality-assuring and storing unsaturated zone data, non-standardized data management has limited data availability. This session will commence with a discussion of standardized methods for data storage and QA within the USGS.

Handy Links for UZIG Members

UZIG Listserv discussion forum

The UZIG listserv was enabled to facilitate communication and initiate conversations with the entire UZIG group. Conversations are archived and publicly available at the following link. See “Letter from the UZIG Chair” for more information.

<https://lists.ufl.edu/cgi-bin/wa?A0=UZIG-L>

Recent Publications

A compilation of recent publications focused on unsaturated-zone research is available from the UZIG website. If you would like to add a publication to the

compilation, please contact Andy O’Reilly (aoreilly@olemiss.edu).

<http://mn.water.usgs.gov/uzig/links.htm>

Active unsaturated-zone projects

A compilation of UZ-focused projects including lab, field, and (or) modeling is available from the UZIG website. If you have an active project that you would like to have included in the compilation, please contact Randy Bayless (ebayless@usgs.gov).

<http://mn.water.usgs.gov/uzig/links.htm>

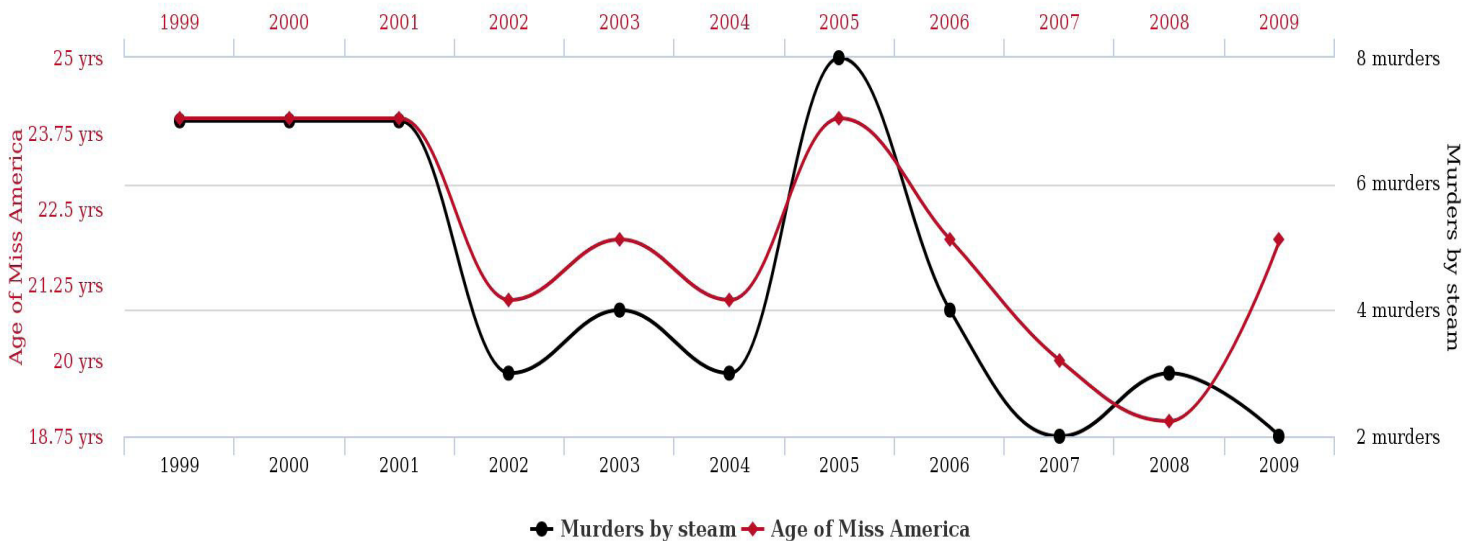
Humor Corner

Just a humorous reminder to be careful with correlations; correlation is not causation

Age of Miss America

correlates with

Murders by steam, hot vapours and hot objects



tylervigen.com

“Murders by steam” by Tyler Vigen is licensed under CC BY 4.0