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Director’s Corner

It looks like we’re off to another great Spring 2016 semester! We have several new students, and a great lineup of speakers for the colloquium this semester (see page 8 for information on our upcoming speakers). Our annual joint dinner forum with the Nevada Water Resources Association (NWRA) is coming up on April 5 and will feature Dr. Ty Ferré of the University of Arizona. Dr. Ferré is the Distinguished Darcy lecturer and he will be giving a talk on data, models, and decision-making in a water world. Be sure to register for this event by March 15 to get the best rate! Most of the key water players in the region are part of NWRA, so those of you graduating should plan to attend to get a heads up on where the jobs might be if you plan to stay in Nevada.

As this goes to press, our annual recruitment event is unfolding on March 4-5. We have prospective students homing in on Reno from all over the country to find out about our Program, UNR, and the Reno area. Let’s be sure to give them a hearty welcome and share your knowledge about the GPHS, UNR, and living in Reno. A schedule of their planned itinerary is on page 8 and includes visits with faculty and tours of the UNR and DRI campuses, attending the Friday colloquium, a tour of the Sierra/Lake Tahoe area, and a dinner social with SAIWI.

As part of the recruitment events, please attend the colloquium on Friday, March 5 which will feature an alumnus of the program (2005), Dr. Mark Engle of the US Geological Survey who will talk about “Geochemistry and origin of produced waters from shale gas and tight oil reservoirs.” Students can take advantage of our breakfast and lunch opportunities to interact with the speaker and find out what life is like after you get your GPHS degree!

Another highlight of the semester is the annual SAIWI Africa Dinner on March 12 at Idlewild Park (see page 10 for more information). And don’t forget that Graduation Ceremonies occur on Friday, May 13 at 4:55 p.m. Note that all GPHS students should walk with the College of Science.

Our faculty have been busy over the past year examining and updating the GPHS Curriculum. Starting in Fall 2016, a new curriculum will become active. The main changes will be that NRES 682 Small Watershed Hydrology will be required for all students, the total number of credits for NRES/GEOL 782 will be 2 credits, students will take one course off of either the Hydrology or the Hydrogeology pick lists, and the pick lists themselves have been updated. The new GPHS Handbook that shows these changes is on the GPHS website (www.hydro.unr.edu). These changes will not apply to students who entered the GPHS prior to Fall 2016. The other change to the GPHS curriculum is that starting in Fall 2016 we will be offering an accelerated BS/MS program where students who are getting an undergraduate degree in Civil Engineering, Environmental Engineering, or Ecohydrology can begin taking graduate courses in the GPHS while still finishing their undergraduate degree. This should enable those students to complete the BS and MS degrees in a shorter time than if they had to do the degrees separately.

I’d like to give a big round of applause to the GPHS student leadership for this year: Steve Bacon, Kelley Sterle, and Rachel Hallnan as Speaker Committee Co-Chairs; Rowan Gaffney, Brian Anderson, and Nicole Goehring as NWRA co-Presidents; Elijah Mlawsky as SAIWI co-President; Claire Archer as AquaClara Editor; and Mary Kate Stewart as Graduate Student Representative. These students have volunteered their time to keep the GPHS vibrant and active and to provide learning and networking opportunities for all of you, so please be sure to thank them. We’re looking for people to take on these leadership roles for next year, so please contact me or any of these students to find out more about what’s involved!

Cheers,
Laurel
Student Spotlight

John Volk on his recent fellowship in Boulder, CO

Last semester I was fortunate to visit the National Center for Atmospheric Research (NCAR) in Boulder, Colorado where I made progress towards my doctorate program. At NCAR I learned to use and modify the Community Land Model (CLM) and how to work on the Yellowstone supercomputer, both maintained by NCAR. CLM is the land surface model coupled within the Community Earth System Model (CESM). Earth system models (ESMs) like CESM are global models that physically represent earth processes such as atmospheric circulation, clouds and aerosols, sea-ice, ocean circulation, land hydrology, biogeochemical cycles, and some anthropogenic activities. Results from ESMs are used to understand regional and global responses of earth systems perturbed by natural or socio-economic scenarios.

Recently a push to improve land hydrology in ESMs has begun. One reason for this is the strong role soil water plays on atmospheric latent heat flux and biogeochemical cycles. As a first step towards evaluating subsurface hydrology in CLM, I ran numerical experiments that quantify the accuracy and computational efficiency tradeoffs with using an noniterative implicit time-stepping scheme for the numerical solution of soil moisture distribution in CLM. I experimented with the spatial discretization of the soil column in CLM and the lower boundary condition. Multivariate and multiscale results showed that the time-stepping scheme effectively removed numerical errors in soil moisture vertical distribution at little computational cost if the algorithmic control parameters were within a certain range. The water budget of the soil column was sensitive to layer spacing, thickness of the soil, and lower boundary conditions.

My trip was made possible thanks to NCAR’s advanced study program and the Consortium of Universities for the Advancement of Hydrologic Sciences Pathfinder fellowship. I would like to thank my host at NCAR, Dr. Martyn Clark, as well as Dr. Sean Swenson and Dr. David Lawrence who enthusiastically engaged with me and involved me in their research.
Alumni Achievements

Congratulations to UNR GPHS alumnus David Berger who was recently named the Director of the USGS Nevada Water Science Center. Berger received his MS in Hydrology/Hydrogeology in 1998.

Student Organizations

**NWRA- Nevada Water Resources Association**

In November, the 2015 Student World Water Forum kicked off with a successful Let’s Talk About Water event thanks to a grant from CUAHSI and additional support from NWRA. The evening began with a screening of the documentary Last Call at the Oasis and ended with an engaging question & answer session that allowed the audience to pose questions to a panel of local and national water resources experts. The turnout was great and included a mix of students, faculty, and community members.

This semester, four UNR Hydro students and one undergraduate traveled down to Las Vegas for the annual NWRA conference, which took place March 1-3. Later this spring the club will again participate in the annual trip to Castle Lake, where students will assist Dr. Sudeep Chandra with sampling. Mark your calendars for April 14-15 (Th-Fri)! In addition, please join us for the spring 2016 GPHS colloquium series and the NWRA organized social following each talk.
SAIWI Travels to Peru

by Elijah Mlawsky

The Student Association for International Water Issues (SAIWI) is happy to report back from a successful service trip to Peru! For two weeks, undergraduate members Lexi Robertson and Devon Eckberg, faculty adviser Keith Dennett and I worked to implement water quality and conservation projects in the developing communities of Ferreñafe and Shipata. SAIWI members worked alongside UNR alumnus, Austin Martin, and fellow Peace Corps volunteer, Matthew Wildhagen, to accomplish their winter trip goals.

In Ferreñafe, Matthew introduced us to his work with the local municipality on a land use assignment. He is tasked with repurposing an abandoned landfill site for community benefit. The 3-acre lot is designated to become an arbor park area. Before our arrival, the fill was lined with 6 inches of clay and 1 yard of soil, and many trees were planted. A challenge exists in efficiently watering the new vegetation; until now, this has been done by hand with buckets. After monitoring the head output of the existing well pump, we successfully designed and constructed a drip irrigation system to water all trees on site, and conserve water by limiting use to specific days.

In Shipata, we worked with Austin to construct a 600-liter drip chlorination system that delivers granular chlorine to the local water reservoir. After educating local operators on maintenance and residual measurement, we obtained a positive residual water sample. For the first time on record, this annex of 200 homes now has potable tap water. The mayor of the encompassing town of Luya has put forward 25% of the installation cost, and has agreed to purchase chlorine for the system into the foreseeable future. We also continued Austin’s bathroom construction project – his eventual goal is to fit every home in the annex with a plumbed toilet and shower, to move away from the latrine system. All equipment for these installations was purchased on site from (grateful) community storeowners, with the help of our terrific donors and sponsors; many thanks to the Reno Rotary Club and to those that support SAIWI at the annual African Dinner event! If you are a motivated student looking to work on local and international water issues, please contact unr.saiwi@gmail.com and visit www.saiwi.org.

The 13th annual Ron Petersen Memorial African Dinner fundraiser event is set for Saturday, March 12th 2016 at the California Building in Idlewild Park. Tickets ($50-non-student/$25-student) include a night of entertainment, great cuisine, and SAIWI trip presentations. For more information, and to reserve tickets, contact Elijah at elijahmlawsky@gmail.com.
New Hydrologic Sciences Students

MATTHEW PECKHAM, MS Hydrology, Advisor: Mae Gustin

Where you are from? Northern Wisconsin
Previous University attended/ program of study: UNR, B.S. Ecohydrology
Research topic: My research involves investigating the biogeochemical transport and fate of mercury.
Interests and hobbies: I have a broad base of interests but I’m particularly into travel, backpacking, fishing, snowboarding, birding, brewing kombucha, cycling, and exercise.
What you are looking forward to most this year? visiting more of the west coast, finishing the rest of my field work, writing and hopefully landing some big fish at Pyramid Lake in between it all.

WILLIAM BOYER, MS Hydrology, Advisor: Maureen MacCarthy

Where are you from? Reno, NV
Previous University attended/program of study: Colorado School of Mines/ Geological Engineering
Research Topic: Economics of water resource management and supply with regards to drought and climate change
Interests and Hobbies: My interests include pretty much anything that allow me to be outside getting exercise, including skiing, whitewater kayaking, rock climbing, hiking, camping, conservation, wilderness and the outdoors, video editing, sustainable engineering, recycling, cooking, and whining.
What am I looking forward to most this year? I am most excited for the spring runoff season; when the earth is green and beautiful, rivers are juicing, and most importantly we get to decide if we’ll remain in a drought situation (and utilize the corresponding implications to calibrate our model and do some actual decision making and design work!)

MITCHELL KREIGER; MS Hydrology, Advisor: Sherm Swanson

Where are you from? Rocklin, CA
Previous University attended/program of study: UNR / Ecohydrology
Research Topic: I’m studying the effects of fire and grazing on stream channel geomorphology, vegetation, and hydrology.
Interests and Hobbies: I enjoy any form of competition, attempting to make food, and camping on the coast.
What are you looking forward to most this year? I’m excited to get into the field.
Congratulations to our recent GPHS graduates!

Erik Cadaret - MS Hydrogeology, advisor Ken McGwire
Thesis: Vegetation canopy cover effects on sediment and salinity loading in the upper Colorado River Basin Mancos Shale formation, Price, Utah

Gwen Davies - MS Hydrogeology, Advisor Wendy Calvin
Thesis: Applications of multi-season hyperspectral remote sensing for acid mine water characterization and mapping of secondary iron minerals associated with acid mine drainage

Jamie Myers - MS Hydrogeology, Advisors Michael Rosen and Rina Schumer
Thesis: Sources of nitrate in northwestern Nevada groundwater, 1985-2014

Susie Rybarski - MS Hydrogeology, Advisor: Greg Pohll
Thesis: Numerical simulation of potential groundwater contaminant pathways from hydraulically fractured oil shale in the Nevada Basin and Range province

Faculty Research Profile: Dr. Adrian Harpold

Have you ever wondered “How does snowmelt become streamflow?” Perhaps you have sat overlooking beautiful Lake Tahoe and thought “What will this place look like as snowpacks change over the next 100 years?” These are the types of questions that Dr. Adrian Harpold and the Nevada Mountain Ecohydrology group are currently tackling. The group is currently tackling three main research foci: 1) How and where are snowpacks changing, 2) What do new snow and precipitation regimes mean for streamflow and water budgets, and 3) What are the cascading effects of changing snow hydrology on biogeochemistry, carbon uptake, forest health and disturbance, and pollutant transport. Dr. Harpold’s research employs a range of tools, including detailed field observation, synthesis of large datasets, LiDAR and spectral remote sensing, and physically based modeling. Current projects in the group span both basic and applied research. For example, current basic research efforts are quantifying the spatial sensitivity of changes in snow to rain, the consequence of altered precipitation phase on water budgets in the Sierra Nevada and Great Basin, the extent of ephemeral snowpacks in the Great Basin, carbon-water coupling in montane forests, and the hydrological effects of insect-caused forest disturbance. More applied efforts are currently focused on including soil moisture measurements in streamflow forecasting and developing recommendations for forest thinning that maximize snow retention and increase streamflow. Dr. Harpold is excited to be one of the few snow hydrologists working in the Great Basin, where much is unknown about the distribution and sensitivity of snow water resources. When he is not thinking about snow, Dr. Harpold is often playing outside or [more likely] working with his wife in the yard at his new house in Reno.
Upcoming GPHS Colloquia

Tuesday, April 5th from 5:15 p.m.-8:00 p.m.

Dr. Ty Ferré – University of Arizona, the 2016 Distinguished Darcy Lecturer

Seeing Things Differently: Rethinking the Relationship between Data and Models

UNR/NWRA Spring Dinner Forum at the Best Western Airport Plaza

Friday, April 15th at 4 p.m.

Dr. Kenneth Tate – University of California at Davis

Producing Livestock and Clean Water on Grazed Landscapes

Davidson Math & Science Building, Room 110, Redfield Auditorium

Friday, April 29th at 4 p.m.

Dr. Dan Giammar – Washington University in St. Louis

Geochemical Reaction and Transport Processes Involved in Geologic Carbon Sequestration

Joint colloquium with Department of Civil and Environmental Engineering

Davidson Math & Science Building, Room 110, Redfield Auditorium

UNR GPHS 2016 Recruitment Fair Schedule

Friday, March 4th

9:00-11:45  Breakfast, tour and interviews at the Desert Research Institute
12:00      Lunch at the Overlook (UNR)
1:00-2:00   Tour of UNR campus
2:00-3:45   UNR faculty interviews
4:00-5:00   Colloquium: Dr. Mark Engle, USGS “Geochemistry and origin of produced water from shale gas and tight oil reservoirs” in DMS 110
5:00-5:45   Social in the Redfield Foyer
6:00       Dinner at Pub and Sub

Saturday, March 5th

9:00- 3:00  Field Trip (meet at UNR at 9 a.m.)
6:00        Dinner and SAIWI slideshow
Recent Publications


Student Association for International Water Issues & International Development Missions

Present:

13th Annual Ron Petersen Memorial

African Dinner

Saturday
March 12, 2016
California Building
Idlewild Park

Doors open at 5:30 pm
Dinner starts at 6:30 pm

For Details and Tickets:
Brittany Taylor (916) 390-0701
taylor_fall@yahoo.com

Event Includes:
* African Cuisine
* Silent Auction & Raffle
* SAIWI Trip Presentations
* Entertainment
* Cash Bar

Tickets: $50 / $25 student
(Limited number of tickets!)

SAIWI.ORG
Seeing Things Differently: Rethinking the Relationship between Data & Models
Exploring how the practice of hydrology depends on computer models while at the same time new methods have been adapted or developed for characterizing and monitoring the subsurface.
For more information on content, visit www.ngwa.org/Foundation/darcy/Pages/Future-Darcy-Lecturer.aspx

Presented by 2016 Darcy Lecturer Ty Ferré, Ph.D.
Department of Hydrology & Water Resources,
University of Arizona

Tuesday, April 5, 2016
Best Western Airport Plaza
1981 Terminal Way, Reno, NV 89502
No-Host Bar 5:15 pm ~ Dinner 6:15 pm
Presentation 7:15 pm

Sponsorships are still available.
775-473-5473

Mr.  Mrs.  Ms.  Dr.

Name

Title

Degree or Suffix

Organization

Address

City            State            Zip

Phone            Fax

Email

REGISTRATION (Select one)

By March 15, 2016

$40 NWRA Members
$45 Non-Members
$20 for Students

After March 15, 2016

$45 for NWRA Members
$50 Non-Members
$25 for Students

CO-SPONSORS
Graduate Program of
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University of Nevada, Reno

Nevada
Water
Resources
Association

To register, please complete this form and send it with payment to: Nevada Water Resources Association (NWRA), P.O. Box 8064, Reno, NV 89507. Please type or print one registration form per attendee. Make checks payable to Nevada Water Resources Association. You may also register online at www.nwra.org.

CANCELLATION POLICY:
All cancellations must be received in writing on company letterhead and sent to NWRA via fax (775-473-5473), by mail to P.O. Box 8064, Reno, NV 89507, or by e-mail to creativerno@charter.net. All cancellations postmarked by March 29, 2016, will receive a refund minus a 25% administrative fee. Cancellations received after that date will not be refunded. Substitutions are welcome if you have purchased the registration with a credit card, the convenience fee is non-refundable.