In celebration of the success of our annual Water Research Symposium, I have asked Professor Glenn Brown, Symposium Chair, to prepare a history to include in this column. We held our 8th Symposium this fall, which was our most successful to date. Each year attracts increased interest, higher quality presentations, more discussion, and more attendees. I want to thank Dr. Brown for his leadership in elevating this Symposium as the State’s most important water research meeting for water managers, regulators, scientists, and users in Oklahoma.

History of the OWRRI Water Research Symposium
By Dr. Glenn Brown

Curiously, the genesis of the Oklahoma Water Resources Research Institute’s annual symposium can be traced back to an AWRA meeting in Keystone, Colorado, in the summer of 2002. I presented a short paper co-authored with Jurgen Garbrecht (USDA Agricultural Research Service) entitled, Precipitation Trends and Groundwater in the Arbuckle Formation of Oklahoma. After the session, Noel Osborn of the Oklahoma Water Resources Board came up and introduced herself. As anyone who has attended the Symposium would know, she was soon to be in the middle of the epic Arbuckle aquifer study, which pretty much consumed her life until last year. We had a pleasant conversation and exchanged business cards.

While Noel may not have realized it, I was taken aback by the fact we had never crossed paths before. Of course there were “logical” reasons for this lack of familiarity; she is a geologist whose work is generally applied, while I am an engineer who is more theoretical (no laughing out there). Thus, we tend to move in different circles and go to different meetings. Nevertheless, it got me thinking. While Oklahoma has a significant number of talented university, state, and federal employees working in water resources and the environment, we really didn’t have an adequate forum to exchange ideas. The OWRB’s Governor’s Water Conference was a statewide meeting, but it by necessity had to focus on policy issues and wasn’t well attended by researchers.

After returning to Stillwater, I raised the topic with two colleagues in Biosystems, Dan Storm and Mike Smolen. We decided to commit to a symposium and assembled the usual suspects for help, Jurgen, Jeanne Schneider (USDA ARS), Duane Smith (OWRB), Steve Stadler (Geography OSU), Kim Winton (USGS), Dee Ann Sanders (Civil Engineering OSU) and Will Focht (OWRRI). Will was particularly interested in the research symposium since such an activity is conducted by many of the nation’s Water Resources Research Institutes; Will and I served as co-chairs of the first three symposia.

Our first planning meeting in 2002 defined the pattern that we have followed since. The Symposium is designed for academic, federal, state and private profes-
sionals but should also be of interest to community leaders. Speakers are selected based on their interest to the entire audience and are encouraged to lose all the equations from their talks. Authors can submit either abstracts or full papers for the proceedings. Breaks are long and have a good supply of coffee. (Coffee was Kim’s demand.) A small, separate poster session was held the first year, which has morphed into the larger integrated professional and student session we have now.

Notability, the 2003 planning meeting minutes lists as our first decision,

“Following Duane Smith’s suggestion, the specific purpose of the meeting would be to provide a forum for discussion of factors associated with the proposed Oklahoma, State Water Plan. Hoped for products will be recommendations for water management priorities, identification of research needs and the creation of new multi-organizational teams to pursue specific project funding.”

Our commitment to the Water Plan has continued and resulted in merging with the Governor’s Water Conference in 2007. The merger was intended to focus as much attention as possible on the OWRB’s planning efforts. A secondary consideration to the OWRRI is that the merger achieved significant economies of scales.

An original intent was to move the Symposium around the state regularly, which was possible before the merger. However, the logistics of the growing combined event have limited our possible venues. While the first Symposium was a Biosystems Engineering event, since 2004 the OWRRI has taken an ever increasing role, and now Mike Langston and his staff led by Jenny Jafek-Jones and Jeri Fleming have assumed the lion’s share of the work and coordination with the OWRB.

Over the last eight years, we tackled some rather difficult issues including, Tar Creek, phosphorous in surface waters, climate change, groundwater arsenic, tribal water concerns, and the Arbuckle-Simpson aquifer (Noel’s favorite). We have also looked at exciting developments such as the Oklahoma River improvements and the progress in the State Water Plan. All-in-all, we have done pretty well.

The Symposium planners have always actively solicited feedback and tried to improve its value to the attendees. We are pleased that we have participation from a wide range of organizations. In 2010 we had speakers from four universities, two federal agencies, one state agency and three private companies. A great enhancement has been the addition of the student poster competition with funding by the Chickasaw, Cherokee, Choctaw, and Iowa nations. That contest has provided a valuable learning experience to many students from throughout the state. Of course, my favorite tradition is the luncheon water resources history talk. Speakers have included Ken and Ruth Wright on Machu Picchu, Mac McKee on Petra, myself on Henry Darcy, and no less than three presentations by Jurgen, on Pergamum, Urartu and Oklahoma. Most obvious to attendees, this year we and the OWRB agreed on a concurrent session format, which reduced the total conference to two days, while allowing other organizations to participate at the meeting.

I wish to thank everyone who helped with the meeting through the years, and regret that I named only a few above. We look forward to seeing everyone next year!
Undergraduate Takes Top Prize in Student Poster Contest
Jeri Fleming

The OWRRI's annual student poster contest, held in conjunction with the Water Research Symposium, saw its second undergraduate winner. Laura Merriman's prize-winning poster *Quantifying Evapotranspiration for Wetlands* was based on research funded by the National Science Foundation and conducted in Florida.

In 2010, Merriman, an OSU Bio-Systems and Agricultural Engineering senior, was awarded a summer internship through the NSF's Research Experience for Undergraduates program. She picked the project in Florida because wetland restoration is becoming more important to Oklahoma and this was an opportunity for her to see how it is done in a state with more experience.

Dr. Glenn Brown, Bio-Systems and Agricultural Engineering professor, encouraged Merriman to enter the poster contest, which was her first. He told her it would be good experience for future competitions and they had discussed her research quite a bit.

“I did it for the experience and to share my findings,” Merriman said.

The symposium was a learning experience for her. After doing internships with Caterpillar and John Deere she said it was great to see the sharing of ideas. You don’t see that in the corporate world.

“I really like that in academia it’s about making things better for society,” Merriman said. “Seeing the collaboration and knowledge sharing was great.”

While no one else in her family is an engineer, she said she was good at science and math and thought it would be a good fit. Her younger brother is following somewhat in her footsteps. He is majoring in Chemical Engineering at OSU.

“Being able to solve problems interests me,” Merriman said.

Originally from Holdenville, Okla. Merriman plans to continue her education next fall in graduate school. She is not sure where she will go but her top pick is North Carolina State. While she loves OSU and the department, she wants to diversify her experiences.

Her long-term goal is to go into international extension.

“I want to take simple technologies, either for water quality or quantity, to developing countries and teach them how to use it,” Merriman said.

The prize money has already come in handy. Merriman has been lugging around a desktop computer instead of a laptop. She took it with her to Illinois for an internship and to Florida. When she found out she won, she went straight to Best Buy and got a small laptop that fits in her backpack.

This year's contest was the biggest so far with 28 posters presented.

“The important things about the contest are that it benefits the students and that it gets the information out there,” Mike Langston OWRRI assistant director said. “We are quite pleased with this year’s contest because of the broad participation, the quality of the research represented, and the enthusiasm and professionalism of the students.”

*continued on page 8*
SCOTT HULER:
On the Grid, A love letter to engineers and taxes

Each year at the Governor’s Water Conference the Oklahoma Water Resources Board finds a keynote speaker that will be both entertaining and informative about water issues. This year’s speaker was no exception.

Thanks to a love affair his two-year-old had with an ordinary object, a manhole cover, Scott Huler began a journey of discovery. He wanted to find out what was underneath that cover; his first thought was probably a sewer but what he found underneath his feet surprised him. In his book On the Grid, Huler tracks the infrastructure backwards along the grid to its origin.

What he found was the manhole cover hid not just sewers but storm drains, gas and electric lines, water pipes, telephone and cable lines. These hidden lines, cables and pipes bring to and take away from homes the things that make life easy. But one question remained: Where does it come from?

As Huler learned about water treatment, sewage settling, road building, nuclear power and stormwater management he fell in love with two things, engineers and taxes.

“My book turns out to be fundamentally two love letters, both to recipients not highly accustomed to receiving love letters,” Huler said during his talk. “To all you engineers out there please, let me tell you: thank you, thank you, thank you. You’re doing God’s work here on earth, cleaning our water and settling out our poop.”

Huler said engineers make the lives we live possible. He also learned that most people don’t know very much about the infrastructure that makes their lives easier. When he approached engineers and those that treat, channel and test the water, he found people eager to talk to him; to share what they know with an interested citizen. He also uncovered the difficulties faced by those that work in the field.

“About water, as about most of our miraculous but under appreciated and underfunded infrastructure, I have to quote television host and science historian James Burke, who said ‘Never have so many people understood so little about so much,’” Huler said.

He found this to be true when talking to an engineer about stormwater management. She explained that going to a civic meeting and informing them that you were going to develop a “constructed wetland” almost immediately resulted in a very negative reaction. They could just see a truck full of alligators ready to unload, followed by a truckload of mosquitoes. But, when the engineer said instead they were getting a “water garden,” they loved the idea. The same held true for a bioretention area, or rather a “rain garden.” It is all in how you word it.

And it results in a “win-win-win…” Huler said. “Because among the things that happen to water as it trickles through the earth instead of running down the street is…treatment people. It gets clean! That’s how the whole thing is designed.” Huler said.

The second love letter is to taxes. While that may seem odd - no one enjoys paying taxes - they are what fund so much of the nation’s infrastructure.

continued on page 5
“Every person I spoke to for this book agreed on one fundamental point: we face no technical challenges we cannot overcome. None. Smart grid? We can do it. High speed rail? Sure! Want to pull all the estrogen out of your wastewater? Easy! Just build a reverse osmosis plant,” Huler said. “The thing is it all costs. That’s the money part. And we have to decide to pay it – that’s the political will.”

Huler said taxes are a way a community identifies what is important. Infrastructure is part of the community and yet it isn’t well taken care of, mainly because most people don’t understand it. They generally can’t see it or touch it, but water is different, and can be used to educate people about infrastructure.

“We can’t let it fail, and that means we have to do nothing more – and nothing less – than open our wallets. It’s all our infrastructure, but the good news is we can educate people through water. Water is a special case in that infrastructure world where nobody really understands things,” Huler said. “…people actually GET water – it occupies space, it has weight, if you put your arm in it you get wet, if it’s polluted it stinks, and without it we know we die. Water works in a way a person can get. And people need to get that.”

Huler concluded his remarks by saying “The point is simple. Yes, never before have so many understood so little about so much. But we need to recognize it’s immoral to understand so little. We need to understand. It’s our duty to understand. For ourselves – for our kids – for our planet. We need to understand.”

The Wonders of Machu Picchu: An interview with Ken and Ruth Wright

Machu Picchu is an ancient city thousands of miles away. What first sparked your interest?

Our interest in Machu Picchu was sparked in 1974 when Ruth visited Machu Picchu for the first time. When she returned she told me about the 16 fountains and asked:

1. Where did the water come from?
2. How can there be a water supply on top of a mountain?

I said, “Ruth, I’ll go find out!” It took 20 years to get a permit; in 1994 the Peruvian government relented and notified us that we should submit a formal proposal for the study of water at Machu Picchu.

Ruth, your books focus a bit more on the tourist aspect of Machu Picchu. What’s the best spot for visitors? Do you have a favorite spot and if so, why?

The best spot for visitors is the guardhouse because of the overview of Machu Picchu in all its glory, showcasing its spectacular setting with Huayna Picchu in the background, the Urubamba River far below encircling the site, and the high Andes standing like sentinels. My personal favorite spot is the top of the Intiwatana pyramid late in the afternoon when most of the tourists have left, the sun is low, and the colors are rich. This is a time for quiet reflection on the people and their culture that enabled them to embellish this wondrous natural setting.

Kenneth, there is no question that Machu Picchu is an engineering marvel. What do you think is the most valuable thing that can be learned from studying the site?

The most valuable thing that can be learned at Machu Picchu is a respect for the pre-historic people of the Andes and their high standard of care. The Inca public works design and construction was compatible with nature and resulted in buildings and features that were harmonious and integrated. The Inca were tremendous stewards of the soil and knew a great deal about proper drainage. It is remarkable that these people who had no written language and did not use the wheel were able to create such magnificent structures that still stand today.
Judging was close and resulted in ties for second and third place.

Second place winners are Maryse Sagbohan with her poster titled *Quantification of Water Fluxes and Irrigation Water Use through Remote Sensing and Attempt to Study the Parameters that Control Actual Evapotranspiration*, and Russell Dutnell’s titled *Preliminary Findings of a Fluvial Geomorphic and Sediment Transport Study of the Little River Upstream of Lake Thunderbird Using an Acoustic Doppler Current Profiler (ADCP)*.

Third place winners are Kaliana Moro Tanganelli and her poster *Sequential Fractionation and Water Soluble Phosphorus Methods to Investigate Soil Phosphorus in a Long-Term Manure Application*, and Tabor Midgley’s titled *Evaluation of the Bank Stability and Toe Erosion Model (BSTEM) for Predicting Lateral Streambank Retreat on Ozark Streams*.

This year enough sponsorship money was donated to cover the students’ registration fees. This was a welcome saving for the students.

Sponsors for this year’s event were the Choctaw Nation, Cherokee Nation, Iowa Tribe of Oklahoma and Chickasaw Nation.

Judges were Guy Sewell, East Central University, who also served as poster chair; Mike Mathis, Chesapeake Energy; Kevin Stubbs, U.S. Fish and Wildlife Service; Cindy Cesar, Northeastern State University.

The OWRRI staff would like to express their appreciation to the sponsors for their generosity and to the judges who freely gave of their time to make the contest possible.

The posters and their abstracts will be posted on the OWRRI website in January. You will be able to view them at http://environ.okstate.edu/okwater.