Water is the driving force of all nature.

Leonardo da Vinci

Some of us are Republicans, some are Democrats. Some of us drive Fords, others drive Chevys. About half of us are male, about half are female. We all need water. Water is the universal solvent. You can live longer without food than without water. More people are killed by water than (name your favorite villain)… There may be more information and misinformation about water than there is about any other substance. It is interesting to me that water provides what is arguably the biggest cultural difference between people from the eastern and western sections of the US. It seems to even override the urban-rural division somewhat. Generally speaking, in the east there is a lot of water and it is taken for granted. In the west, where we are classified as arid or semi-arid, most of us tend to have a little more appreciation for water. Especially those of us in agriculture or natural resources. When my family lived in College Station (SE Texas, ~40 inches of rain per year), we had a little over an acre of yard with our house. I spent a lot of time mowing grass. Unlike my neighbors, I did not spend a lot of time watering. I “managed” my yard like a pasture. When we did have some dry spells I would “defer it”, let it grow a little taller, put down deeper roots, and then when I did water it, I watered at night and pretty heavily. Admittedly, I did not have the prettiest manicured putting-green looking yard in town but my grass did not wither up and turn brown after one hot windy day either. You might be a range nerd if you “manage” your yard. I would also get on to my boys for leaving water running in the sink or taking showers too long or forgetting to turn off the water for the horses… I guess being a range person and after living in south and west Texas my perspective on grass and water was a little different than my neighbors. It is kind of against my religion to grow grass that a critter can’t eat or live in… unless it is on a football field of course but that is different. Well, times change. Here in Arizona my yard is gravel instead of grass. It
make sense; it doesn’t require water.

Folks around here tell me that school kids used to learn about the five “C’s” in Arizona. Cattle, Copper, Citrus, Cotton, and Climate. The things that “made the state what it is today”. What does that have to do with water? Cattle need water. OK, how much does a cow drink? A good rule of thumb is a gallon per 100 lbs. of body weight per day in cooler weather and twice that in hot weather. Lactating cows require more. Where do cows get that water? Dirt tanks, piped to troughs from wells, streams… Water is used for several of the extraction processes in copper mining. Citrus and cotton crops obviously need water to grow. Most of that comes from irrigation. What about climate; isn’t the fact that we have a “dry heat” why tourists come here? We live in a desert. Yes, but then you need water to cool off in the pool, to create that manicured putting green, and to provide “mist” for the patrons at the sidewalk café. I think you could add another “C” for culture. The culture of this state is varied and comes from a long history, a lot of that defined by water. Think about the Sinagua for instance. Sin - agua is Spanish for “without - water”. These agricultural and hunter-gatherer people occupied much of central Arizona between 500 and 1425 AD. We have many preserved Sinagua sites right here in the Verde Valley. Montezuma Castle, Montezuma Well, and the V Bar V Petroglyphs are just along the western border of the ranch for instance. Along Beaver Creek. There are many more. And you can still see some of the prehistoric irrigation canals associated with these sites today. European settlers also located ranches and towns around water. We learned that in geography class in middle school I suspect. It happens all over the world. Even with modern technological advances, this trend continues today. Where would Phoenix be without water? Why should we care what the level is in Lake Mead or Lake Powell? Why is the Colorado snow pack important? I know I am asking a lot of rhetorical questions here and thus, not providing a lot of answers. I admit, I am just trying to stimulate your curiosity. It would take an entire publication to really discuss all the history and implications of water in Arizona. And as luck would have it, the University of Arizona has a great publication to do just that. The Layperson’s Guide to Arizona Water from the Water Education Foundation and the University of Arizona Water Resources Research Center is one we all should read.

So what can we say about water that hasn’t already been said? I am probably over stating the obvious by writing a range newsletter article about water. Probably preaching to the choir. We all know how important water is. We have had biology class. We know that water is made of one oxygen and two hydrogen atoms. We know this chemical structure helps form adhesive forces that allow water to move upward against gravity.
Water....continued

inside small narrow spaces (i.e. capillary action) and this is how water gets from roots to the above ground parts of a plant. We know that about 70% of an adult human’s body is water. That about 70% of the Earth’s surface is covered with water and ~97% of that is salt water. Water exists in solid, liquid, and gaseous states. We know about the water cycle, and that depending on location, 40 to 100% of annual precipitation returns to the atmosphere as evapotranspiration. Had enough? Suffice it to say that water is critical, an absolute requirement for life as we know it. That is why agriculture and natural resources scientists are working to find better ways to use water more efficiently. To be better stewards. It is kind of a big deal.
Chris's Hot Topic of Range......Rain in the Rimrock

*Whiskey is for drinking. Water is for fighting over.* ~ Mark Twain
(Unknown?)

That’s my favorite water quote, though it seems that authorities on the interwebs are convinced that Mark Twain never actually said it. Still, it is a fair characterization of the west and water. Water is simply a limiting factor out here and I think we are justified in our obsession with it (Figure 1). Like Dr. Tolleson alluded to, there is a lot to be said about water, more than can fit in this little article. So I’m going to focus on the specifics of monsoon rain and our work monitoring it.

In general Arizona’s annual rain fits a theme. The water year starts in October where we get half our annual rain throughout the winter. These rains come from the north and are characterized as light and evenly distributed. At higher elevations the rain is “supposed” to fall as snow where it creates a good solid snow bank that slowly feeds streams and creeks as the seasons turn. This year CLIMAS said that the snow water equivalent ranged from 2 to 74% of average and last year wasn’t much better, and future climate projections suggest weaker winter storms with an even more reduced snow bank. There are a lot of social, political, economic, and environmental issues with this changing climate trend, but that’s a discussion for another day.

Anyway, these winter storms come and go until about Late April when everything dries up. At this point it is blue skies and scorching sun until the monsoon starts up (hopefully) the first week of July. The summer monsoon is where the real unpredictable fun begins. Our monsoons are remnants of tropical storms and hurricanes. Strong and devastating when they first hit land, these storms are mostly spent and fragmented by the time they reach us. The rain is heavy, but can be very locally isolated. It is not uncommon to be sitting high and dry while watching a torrential downpour a few miles down the road (Figure 2). It’s the time of year when the tanks fill up, drainages run with flash floods, and roads wash out. This is also where we laugh at that whole, “At least it’s a dry heat,” comment we hear from out-of-staters. There’s nothing like vegetation monitoring, a day after a monsoonal downpour, in 120
degrees and 100% humidity. These monsoons last till late September and provide the other half of our annual precipitation.

That’s the general rainfall theme and the state of Arizona has a network of weather stations to follow the rain and report the regional numbers (Figure 3). The problem is that regional averages during the monsoon season are not necessarily what we see locally. It seems that the only real predictability of these monsoons is how unpredictable they are, at least where local details are concerned. These summer storms are fragmented and rather sporadic, meaning that a single ranch could have one pasture struggling with drought conditions while the next pasture could have too much water. This unpredictability across time (temporal) and space (spatial) can make management rather difficult. One solution could be to increase the weather stations in the state, but the price of installing a weather station in every pasture is prohibitive. A more practical solution would be to fill the gaps with cheap rain gauges.

So that’s what we did this past summer on three Ranches; the V Bar V, Orme, and W Dart. Other studies have shown that increasing the number of rain gauges can pick up more detail, so we thought we’d try that out with some very cheap PVC pipe volumetric gauges. These were simple 2in diameter PVC pipes cut at 2 to 3ft lengths then capped with an end piece (Figure 4). A small amount of a 1:1 transmission fluid/anti-freeze mixture was added to prevent evaporation and the entire system was checked weekly during the monsoon with a ruler. This design was chosen simply because it is cheap and because a lot of ranchers were already using it. Now the data collected from the PVC pipe is very coarse, we would be rounding to the nearest 8th of an inch while the county gauges would round to a hundredth of an inch, but we thought it would be accurate enough to inform management about the local rainfall patterns. We had 11 rain gauge locations in total. To test for accuracy we paired two of those sites with a RainWise Tipping Bucket rain gauge, two with a county weather station, and two with both the RainWise tipping Bucket and the county Weather Station.

We found that a network of PVC pipe volumetric rain gauges can record the spatial variability in the monsoon rains. The extremes were really interesting, with some very noticeable torrential downpours hitting a few sites but missing most of everything else. The biggest of these storms hit the Orme Ranch during the extreme
floods that hit Phoenix last summer. One gauge had two storms back to back that dropped a total of 3.6 inches on it while the nearest gauge, just five miles away, received only 0.8 inches (Figure 5).

Temporal variability is a little harder to visualize since it requires plotting a site across time (Figure 6). The end of season monsoon totals may be good, but the timing of exactly when that rain fell during the monsoon could influence the growth of different plants and thus influence management. Early rains may impact warm season plant germination and growth while late rains could influence cool season germination and growth. To better visualize this pattern we graphed the weekly rainfall totals along with the historic 30 year average of the site (Figure 6). Most sites had decent early rainfall that slowed down at the end of the monsoon. Orme ranch was a little different, suffering from below average rain early on with an increase in rainfall at the end of the monsoon. The difference shows that even in the same year, with locations relatively near each other, there can be a difference in rainfall timing.

Over all this little study was successful. It demonstrated that a network of cheap PVC pipe volumetric rain gauges can pick up the important details missed by the statewide weather station network (Figure 7,8). Rancher response was also positive, with Dr. Dave Schafer adding, “I do believe that the rain data you gathered was useful for informing management both now, in the future & will be a great reference back in years to come. Recording the precipitation at the various places around the ranch helps to get a sense of how widespread the rainfall has been & if there may be areas that need to be grazed
Chris's Hot Topic of Range……continued

differently as a result. It will be a great tool for looking back to not only look at the grazing effects but also cattle performance relative to when the rains occurred.”

One slight caveat is that there were some interesting differences between rain collecting methods. The PVC and Tipping Buckets consistently recorded a little more weekly rain, which did add up a little by the end of the study. Some variability is expected since these are different collection methods. Things like wind speed, rain gauge width, and even height above the ground can alter the amount of rain recorded. So the next step will be to use several cheap PVC volumetric gauges, and the county weather stations, and create a calibration that will more closely tie the two methods together. Should be fun and is definitely on my to do list as this next monsoon approaches. Here’s hoping we get plenty of rain to record.
Let me begin by saying *yes, it is okay to read this article in the crooning voice of George Jones, I won’t judge!* (And yes, there is a connection between the song title and the need for future land managers, I promise.)

There are some exciting things going on in the world of range science education! I was fortunate to attend the 68th Annual Society for Range Management Conference in Sacramento, California, January 31-February 6 where over 1,500 range professionals participated in the over 100 symposia, workshop and technical sessions that were offered. I participated in the K-12 Education Symposium where educators, administrators and range professionals met to discuss, identify, and address challenges related to the implementation of more range based educational programs into school curricula and forming an overall K-12 range education network and eventually, providing a cohesive curriculum. Several presenters from across the US shared their ideas and experience in hopes of promoting scientific range based educational opportunities to youth.

**Rangeland Literacy - Seth Pratt**
Seth is a fifth generation Idaho cattle rancher and former National FFA officer, a position which required extensive travel and public speaking, building support for agriculture education, and encouraging youth into agricultural careers. He is studying Agriculture Economics at the University of Idaho and works on fundraising and government relations for the College of Agriculture. Seth is an agricultural optimist, and believes the answers to climate change, human health, and environmental stewardship lie within agriculture.

**Junior Animal Scientist Program – Jim Sartin**
Dr. Sartin is the past president of the American Society of Animal Science and current Professor of Anatomy, Physiology and Pharmacology at Auburn University. Dr. Sartin shared information about AnimalSmart.org and the Junior Animal Scientist program, detailed in a recent article on the American Society for Animal Science website:

**Passion for Educating Future Animal Scientists: Dr. Jim Sartin**
Plans are taking shape for a collaborative effort between *Jr. Animal Scientist* and the Society for Range Management. Initiatives like this wouldn't be possible without the support and outreach efforts of ASAS Foundation donors.

Recently, Dr. Jim Sartin, a past ASAS president and current Editor-in-Chief of *Animal Frontiers*, shared the message and goals of *Jr. Animal Scientist* and AnimalSmart.org with the Society for Range Management (SRM) during a symposium at its 2015 annual meeting in Sacramento, Calif. He talked about the need for and evolution of a consumer-friendly web site like AnimalSmart.org, as well as the challenges associated with maintaining it. Attendees also learned how the site and magazine are funded and the success of the program.
Lisa’s Class is Outside Today...continued

Seeing interest from the group, Dr. Sartin invited the Society to contribute to a future issue of *Jr. Animal Scientist*. They seemed very interested," he said. In fact, the topic ofanimals and land use"is tentatively scheduled to run in the September 2015 issue of *Jr. Animal Scientist*.

**An Educator's Perspective on Rangelands Curriculum and**

**Rangelands Curriculum from Welder Wildlife Foundation in Texas - Sandra. L. Johnson**

Dr. Sandra Johnson PH.D. gave two presentations centered around rangeland curriculum. Dr. Johnson is a former teacher with experience with kindergarten, elementary, secondary and gifted and talented students. She is also an educational consultant who specializes in curriculum writing and alignment with the Texas Essential Knowledge and Skills (TEKS). She is also a professional development specialist for teachers in science and has served as a science consultant working with 59 school districts. She has co-written Rangelands: A Conservation Guide for Welder Wildlife Foundation, a private nonprofit education and research foundation. The Rangelands Curriculum provides K-6th grade teachers information, resources, and lessons that help make conservation meaningful to students. Dr. Johnson has taught at the University of Texas in Austin and Texas A&M Corpus Christi. Dr. Johnson specializes in writing conservation curriculum for non-profit organizations with the purpose of making today’s students more aware of their place in the environment and how they can make a difference in the world around them.

**The Prairie Project - Blayr Gourley**

Blayr Gourley is the Oklahoma State University Natural Resource Ecology and Management Web Specialist. Her background includes a Bachelor of Science degree in agricultural communications and a Master of Science degree in rangeland management, both from Oklahoma State University. She specializes in rangeland management and prescribed fire. She works in promoting these disciplines through websites, social media, and printed materials; as well as working in the field every chance she gets. Currently, Blayr manages several websites including The Prairie Project, an educational website about the prairie ecosystem; The Oklahoma Prescribed Fire Council; The Oklahoma Chapter for the Society for Range Management; and NREM Extension. She is the newsletter editor and designer of the NREM and Oklahoma Chapter of the Wildlife Society newsletters. She also uses social media to promote The Prairie Project and the Prescribed Fire Community of Practice.

**4-H and High School Range Education Programs in Arizona - Doug Tolleson**

Since January 2008, Doug has been a rangeland specialist for the University of Arizona. He has a BS in animal science, MS in reproductive physiology, and a PhD in Rangeland Ecology and Management all from Texas A&M University. While at Texas A&M, Doug was an Assistant Research Scientist and the Director of the Grazingland Animal Nutrition Lab. As director of the lab, Doug taught workshops on monitoring grazing animal nutrition in the US as well as Mexico, Africa, Mongolia, and India. Doug was the past President of the Arizona Section of the Society for Rangeland Management. Dr. Tolleson has served as a reviewer of doctoral theses from Australia and Pakistan and has been on the graduate committee for 3 MS and 3 PhD students. He is currently on the editorial board of the Journal of Animal Science and is the liaison for the American Society of Animal Science to the Society for Range Management. He has authored or co-authored 2 book chapters, 25 journal articles, 32 other peer-reviewed articles, and 110 abstracts. Doug is also responsible for spearheading Range Rocks!, the University of Arizona’s outdoor educational program that provides range science activities and lessons to high school students.
Empowering Teachers to Spark Interest in Range - Gretchen Hyde
Gretchen Hyde is the Executive Director of the Idaho Rangeland Resource Commission, a state agency whose primary mission is to sustain and enhance Idaho’s rangelands and ranching heritage through public education. IRRC provides educational materials for K-12 teachers and students, helpful resources for ranchers and information and tips for outdoor recreationists. IRRC’s goal is to provide programs that result in an informed public that understands and supports balanced responsible management of Idaho’s economically vital private and public rangelands.

K-12 Rangeland Curriculum Showcase - Theresa Becchetti
Theresa Becchetti is the Livestock and Natural Resource Advisor for UC Coop Extension. Theresa has worked on developing a 4-6 grade Rangeland Curriculum and is in the process of submitting the curriculum to California’s Ag in the Classroom to quickly get the curriculum into the hands of teachers. Theresa has also been developing a high school curriculum working with Lovina Roselle and Karen Launchbaugh in Idaho.

How Can the Range Profession Contribute to Development of Ag-STEM Curricula for Middle School Students? - Christine Griffin
Christine Griffin is the principal at Oak Creek School which serves 235 students preschool through eighth grade in the rural town of Cornville, Arizona. Oak Creek School is unique in that it offers agriculture education to students of all ages. Ms. Griffin strives to incorporate STEM standards in her school’s curriculum and introduce students to the natural resources rural Arizona has to offer and show them what jobs are available locally that involve land management, natural resources, range science and agriculture. Oak Creek School works with University of Arizona Cooperative Extension and the V Bar V Range Program, as well as other governmental agencies to incorporate range based activities and lessons to students.

Attracting High School Students to Rangeland Careers - Lovina Roselle
Lovina Roselle is the Outreach Coordinator for the Rangeland Center at the University of Idaho. She is involved with youth education programs offered through the FFA including the Idaho State Environmental and Natural Resources Career Development Event (CDE), the Idaho State Rangeland Assessment CDE, and she is director of the Western National Rangeland CDE. She was involved in developing the Rangeland Teacher Resource Guide and High School Curriculum and regularly responds to teachers from across the nation requesting to use these resources in their classrooms. In 2012, she was recognized for her service and contribution to the Idaho FFA by being presented with an Honorary State FFA Degree. She holds both a BS and MS degree in Rangeland Ecology and Management.

Wildlife Habitat Education Program - Dwayne Elmore
Dwayne Elmore is the Wildlife Extension Specialist and an Associate Professor in the Department of Natural Resource Ecology and Management at Oklahoma State University. He has both Extension and research responsibilities. Specific areas of interest include wildlife habitat relationships, the role of disturbance to maintain sustainable ecosystems, and social constraints to conservation.

As you can see, the diverse backgrounds and unique experience each of these presenters brought to the table just helped to strengthen the mission of the K-12 team which is to reach out to youth and show them there is a wide variety of career options available related to land management and range science.
Lisa’s Class is Outside Today...continued

Dr. Temple Grandin hit the nail on the head when, in her plenary session talk at the SRM meeting, she emphasized the need for providing interactive outdoor, hands on learning activities to youth at a young age; a theme that was echoed throughout the day at the K-12 symposium. She emphasized starting kids on a path toward self-discovery (and ultimately career choice) by offering outdoor educational programs in middle school, or even earlier. Many youth today are first introduced to agricultural and outdoor educational classes in high school FFA and CTE (Career and Technical Education) programs. While providing these programs and getting kids interested in high school is better than not getting them interested at all, if we can introduce kids to these programs at a younger age and spark their interest in outdoor sciences, then we can ultimately provide them with more specialized, career focused courses in high school that will help them pursue a range related degree in college and subsequently related career in the future.

Another one of my favorite Temple Grandin quotes comes to mind that again emphasizes the need for educators to provide proper guidance and curricular framework for youth interested in outdoor science: “We have got to work on keeping these children engaged with the world.” We have to focus on showing youth that careers in animal science, rangeland management, natural resources etc. are not only available, but in demand, and not only viable, but incredibly important for future land use, food production and recreation.

As you may recall, I taught high school agriculture for 4 years, in which I quickly learned that if you, the educator, cannot clearly demonstrate to your students how the lesson you are teaching will affect them in the future, it’s a lost cause. We need to show the next generation of land managers how their actions and decisions will affect not only them, but a vast majority of the general population. We have to keep them engaged with real world issues involving land usage and management, issues that they will have to face in the future.

Although there seemed to be several individual programs available that offered range activities to youth, the K-12 group acknowledged the challenge in creating and providing a complete, cohesive range based curriculum that would aide educators with incorporating more range based activities into their existing units.

Preparing youth for future employment in range science is crucial to help ensure responsible land management and utilization as well as in addressing the growing concern of increasing food production with limited resources. The employment section of the SRM website notes the following in regards to future range managers:

“The Society for Range Management (SRM) is concerned about the future management of rangelands. We are especially concerned about the future of the workforce dedicated to managing these lands. Information from the Office of Personnel Management (OPM) reveals that at least 30% of the workforce currently classified as "Rangeland Management Specialists" (i.e. 454-series) within the US Forest Service (USFS), Bureau of Land Management (BLM), and Natural Resources Conservation Service (NRCS) will likely retire in the next 10 years. Who will fill their shoes?”

In a recent SRM Rangelands article entitled Wyoming’s Aging Agricultural Landscape: Demographic Trends Among Farm and Ranch Operators, 1920–2007 published by the national SRM, the concern over aging agriculturalists is again echoed.

“Across the United States, farmers and ranchers are getting older, and fewer young operators are entering the agricultural workforce than in the past. With a changing local agricultural community, we
Lisa’s Class is Outside Today…continued

face risks associated with loss of local knowledge, loss of tradition, and loss of investment that stem from a deep-rooted sense of place. We face a fundamental challenge in inspiring young agriculturalists to take up residence in the state to help replace those of retirement age.”

Many of the educational programs discussed in the symposium currently utilize STEM based standards which promote the use of technology and scientific data collection in the classroom. These standards also allow for more seamless integration of range science programs into existing classroom curricula.

According to CNN (6 Things You Need To Know About Stem, September 2014) *STEM jobs are growing at 1.7 times the rate of non-STEM jobs, and the U.S. is simply not producing enough candidates to fill them. Only 16% of high school seniors are interested in pursuing STEM careers, according to the Department of Education.*

"[College professors] have changed how they teach in order to draw in a more diverse group," said Londa Schiebinger, professor at Stanford. "They show you the cool applications first -- then they bring in the theory and more difficult techniques. It's hooking people in and showing them what they can do with the skills."

The Range Rocks! program follows much the same idea: we show the kids the neat technology we use out on the range and once they get their hands on it, they are hooked. Unfortunately many students are not aware that jobs in rangeland science and land management even exist, so by incorporating technology use and introducing students to these career options at an early age through STEM related activities and lessons, we are more likely (hopefully?) to fill those future range positions with qualified candidates.

I cannot stress enough the growing need to be better land stewards, especially with populations rising, more food to produce, and more people recreating on open land, all while that land base is diminishing and we are forced to produce more product with fewer available resources. The emphasis on producing more from our rangelands (i.e. beef/meat) while using less resources (i.e. limited grazing land, water and vegetation) is already upon us and that demand will only multiply in future years. This puts increasing pressure on future range professionals to enter the work force prepared with the necessary skills and experience to address these issues; preparation that will come mainly from a solid education and experience gained from plenty of hands on field experience provided by programs like Range Rocks! and other K-12 programs that promote science based research and comprehensive, cohesive curriculum.

I thoroughly enjoyed meeting all of the dedicated professionals who were passionate about instilling the idea of responsible land stewardship and career preparedness upon our youth. Their hard work and dedication towards collaboration and providing quality educational resources to teachers throughout the US really inspired me to do my part in supporting, encouraging and guiding the next generation of land stewards because, looking at this group, they have some big shoes to fill!
Plant of the “Week” by Guest Writer Joelle Acton

This week, I decided to pick a plant that I absolutely love, especially this time of year when everything is in bloom. I’ve also picked this plant because it is a species has a very restrictive range, which happens to be located in one of my favorite hiking spots in Kingman, Arizona.

*Sophora arizonica* (Arizona Necklacepod) is isolated in populations on the eastern and southern foothills of the Hualapai Mountains with portions also found in Graham and northern Cochise County. Its relative is the Texas Sophora which is cultivated throughout Phoenix and Tucson home landscapes. The Arizona Necklacepod is a native species in Arizona (given by the name) that is part of Bean Family (Fabacea) and produces strong pea pods with bright red beans compressed within the pods. Survival of this species greatly depends on moist sites with a north or northeast exposure. Seeding survival is infrequent past May or June usually due to limited moisture. Although its relative species is quite popular throughout the state, this specific species is listed as vulnerable under the National Status Rank of N3 within the United States.

They can be identified as a medium to large tree like shrub with dark green, leathery, compound leaves. The best part of this plant is the purple pea flowers that bloom in the spring time. Just like the rest of the Sophora’s, the flowers put out the most unique and wonderful fragrant. Many compare the fragrance to grape Kool-Aid, where the scent reminds me of that candy delight of sweet tarts. It was the scent and the beautiful flowers that got my attention one day out in the field. Since I have discovered this unique plant, it has become one of my favorites that I seek out every spring.

http://eol.org/pages/415169/details
http://www.arizonensis.org/sonoran/fieldguide/plantae/sophora_arizonica.html
http://swbiodiversity.org/seinet/map/googlemap.php?maptype=taxa&taxon=167258&clid=0
http://www.nazflora.org/Sophora_arizonica.htm
Although Mr Clemens did not actually say the quote about water from Chris’s article, he did say a lot of other things. Here are a few:

*Always respect your superiors; if you have any.*

*Nothing so needs reforming as other people’s habits.*

*Kindness is the language which the deaf can hear and the blind can see.*

**Just me talking…**

I wish I could get “*frequent driver miles*”. It seems like I have spent the last few months on the road. But, we have gotten a lot of things done and the paychecks keep coming so I guess I should not complain. And besides, the scenery in Arizona is great. And my crew just loves it when I have all that windshield time to think up new things for them to do. I am not equating myself with Jerry Stuth, but it seems from their reactions that “*I was thinking in the truck the other day…*” is sort of like Jerry coming back from a trip to somewhere in the world and walking in the lab to say “*Doug, how hard would it be to…*” Maybe I will get to that level someday. Since the last Rimrock Report, we have attended the Arizona Section SRM winter meeting in Tucson (good job Mary Nichols) where we also conducted our first drought workshop of the year and attended the national SRM meeting in Sacramento where we co-chaired the Range K12 Symposium Lisa Page wrote about, along with presenting several talks and posters including the results of our collaborative rain gauge project (thanks Chris Bernau, Mike Crimmins, Dave Schafer, Andy Groseta, Enoch Malouf). We followed that up with another of our drought workshops at Yavapai College in Clarkdale and tag-teamed with Mitch McClaran’s group on a drought planning workshop for ranchers and range managers on the Tonto NF in Globe. We are in the planning stages of 3 more of our drought workshops in northern Arizona this spring and summer. We have submitted or are about to submit 3 grant proposals and a journal article. Chris and Lisa are working on a couple more. I recently attended the 10 year anniversary meeting of the Arizona Livestock Incident Response Team (ALIRT). Peder Cuneo, George Ruyle, Barb Hutchinson and I are looking at possible collaborations between ALIRT and the Rangelands Partnership websites. Looks like we will do another round of cattle brand NIRS this year. The preliminary results are interesting. Maybe we will come up with a high-tech way to fight an old problem (rustling). We also participated in the Verde Valley SciTech festival again this year. Lisa has some Range Rocks! activities lined up for the next several months. Chris is out monitoring. We are heading to the Arizona Strip Workshop next week. Just another day in the neighborhood.

Till next time,

Doug