SHARPSHOOTER
OREGON SOCIETY OF SOIL SCIENTISTS

VOL. XXIV, NO. 2
SPRING 2011

What's Inside This Issue:

PRESIDENT'S MESSAGE

by Josh Owens

I have been a member of Oregon Society of Soil Scientists (OSSS) for three years now and I would like to thank the strong leadership that has come before me for making it an exceptionally fun, interesting, and energizing organization. I am glad to be serving as President and contributing as best I can to continue the great work of OSSS.

Please join us for the 2011 OSSS Summer Field Tour, August 5-6, 2011. We will be going to Klamath Falls to say hello to our members down there and take a look at some really neat soils. Chris Gebauer, project leader for the North Klamath Soil Survey/Winema National Forest EUI, will be showing us around the area on Friday, August 5th. Optional stops will be looked at on Saturday the 6th. The folks at the NRCS Klamath Falls office have given me some great ideas for tour stops, and the hard part will be picking which ones to look at since there are so many interesting things to check out. With the increasing focus on River and Wetland restoration we will definitely be looking at some peat wetland soils around the Wood River in its natural state, and at various stages of restoration after having been reclaimed for pasture. Coincidentally, I am working on a project that involves hydrologic and nutrient modeling at this very site. I have had a request that we go visit some diatomaceous earth, last year a Spodosol was described in the pumice zone for the first time, there are a lot of springs in the area, and of course Crater Lake is pretty close by too. We are in the preliminary stage of planning so please check out our website for updates http://www.oregonsoils.org/ .

For our 2012 Winter meeting we will be teaming up with the Benton Soil and Water Conservation District to hold a Soil Quality Workshop. This will be a great opportunity to meet new people and leverage our passion and knowledge of soils towards encouraging and supporting sustainable soil resource use. Planning for this workshop is underway and more details will be available in the Fall Sharpshooter.

I must admit that water is my first passion, but soil is not that far behind. I am a two-time alumnus of OSU with a BS in Bioresource Research, and recently earning an MS in Water Resources Engineering. Soil moisture and morphology have been my main areas of interest as they very much aid in the understanding of hydrologic processes. Before coming to Corvallis for graduate school I was a Peace Corps Volunteer in Senegal, working as an Agroforestry Extension Agent to combat deforestation, improve soil quality, and diversify income and nutrition sources. I have also worked in Davis, CA, as an environmental consultant. My formative years were split between growing up on a poultry farm in Dayton, OR, and moving with my family to Southern Africa where I graduated from high school.

WESTSIDE NOTES

by Scott Burns, PSU

Update on Jory as our State Soil

We are getting closer to getting the Jory Soil officially accepted!

Last month, I testified before the House committee along with Representative Mitch Greenlick from Portland. We got out of committee and went to the House floor and it passed 40-18. That is great!

We now make our presentation to the Senate committee on natural resources and the environment on May 12. The committee meets from 3:00-4:30 PM. I will be testifying. It is in Salem at the capitol building - not sure on the room yet. If we get out of committee and get to the floor, we have a chance!

Come show your support for Jory!

Senate testimony by Scott Burns and Jay Noller regarding State Soil Jory May 12th 3:00-4:30 PM Capitol Building- Salem, OR

ANOTHER SUCCESSFUL OSSS WINTER MEETING

by Tom Clark

OSSS President, Cory Owens, successfully facilitated the 2011 Winter Meeting held in McMinnville on February 24-25, 2011. The McMinnville Grand Ballroom (two blocks west of McMenamins Hotel Oregon on 3rd Street) hosted the meeting. The room was spacious, well lit, with good seating for the well attended event. Excellent food was provided with continental breakfasts, lunches and Thursday evening refreshments. On an optimistic note for the future of the OSSS, many students were in attendance. Scott Burns (PSU) and Jay Noller (OSU) continue to mentor their students and promote OSSS with enthusiasm.

Ben Franklin waiting for a thaw at the snowy 2011 OSSS-NWFSC winter meeting held at the Grand Ballroom in McMinnville, Oregon.

Wednesday evening was a time for socializing and informal networking. A small contingent met at the McMenamin's upstairs restaurant to drink some beer and tell tall/short tales. It's wonderful to meet old/new friends at these meetings.

The agenda held true to the theme of "Soil Carbon and You: It's Complicated." Soil carbon definitely is a hot issue with much funding heading its way

Thursday morning featured a couple of fine speakers. Presentations were given by Dr. Mike Strobel, from the NRCS Water and Climate Center, and Dr. Scott Holub representing Weyerhaeuser. Dr. Strobel gave us an overview on climate change with special emphasis on the trends of the snow pack in the U.S. Because the snow pack supplies 50 to 80% of our water supply, the precipitation form, geographic distribution, and timing of the snowmelt is critical. He definitely was on the side of global warming advocacy, giving the evidence and the

potential downside of the stronger greenhouse effect on the planet's future. On a personal note—How anyone can prove a connection of increased heart attacks with global warming is beyond me. Dr. Holub talked on carbon sequestration as it relates to the amount of CO_2 being released to the atmosphere. Over 2/3 of stored carbon is in soils and the forest floor. Most carbon in the soil is stable and does not affect CO_2 in the atmosphere. He discussed the 9 sites in Oregon and Washington that they are using to measure the carbon sequestered in the soil both horizontally and vertically. So far they have discovered that the variation in soil C is too variable to map accurately. However, this is an ongoing project and hopes are high for the future. The carbon sequestration research project is in collaboration with the NRCS and other agencies.

The morning ended with a student mentoring breakout session and networking. A superb lunch buffet followed. Our registration money was being well spent. A number of students commented favorably for this session and would like to have it expanded for future meetings.

Thursday afternoon produced an array of fine speakers. Jim Archuleta of the U.S. Forest Service, Dr. Mark Johnson of the Western Ecology Division of the EPA, and Dr. Dawn Ferris of the Soil Science Society of America gave presentations. Mr. Archuleta intrigued us with a discussion on biochar. The USFS study on biochar is in conjunction with their wildlife program. Biochar is a carbon rich product created when a biomass is heated with little or no available oxygen. When biochar is applied to forage plots and incorporated under forest canopies, a lot of good things happen in the soil. The soil retains nutrients and thereby increases productivity. The moisture holding capacity and the cation exchange capacity (CEC) of the soil is increased with the addition of biochar (app. 3.6 tons per acre) with all the resultant benefits to the environment. Dr. Johnson talked on the global reservoirs of carbon (highest in oceans and recoverable carbon fuels) and its interplay with atmospheric carbon (CO_2). Can carbon sequestration in soils be used to mitigate atmospheric carbon? The answer is "yes." The goals of carbon sequestration and its corresponding management practices are to maintain, restore and enlarge carbon sequestration. Any practice that enhances natural wetlands, maintains soil fertility, prevents deforestation and increases efficiency of forest product use helps achieve these goals. The NRCS is currently working on a National Rapid Carbon Assessment to create a current soil carbon baseline for the U.S. On a personal note—It appears that the time honored goals of soil health are still in play. The difference is that we have the added funding coming from global warming and carbon sequestration issues. Dr. Ferris concluded the afternoon's agenda with an enthusiastic endorsement of the Soil Science Society of America (SSSA). The OSSS meeting is just one stop for Dr. Ferris as she travels around the country encouraging membership in the SSSA and cooperation with the local state soil's societies. The SSSA is paying more attention to non-academics and moving away from certification and towards licensing of soil scientists. They're trying to achieve consistency among the states in this regard. More information can be found from the following internet source – www.soils.org/certification/licensing. SSSA is also starting to take advantage of social networking sites such as Facebook, Twitter, and the soil blog http://wiredsoils.blogspot.com/. This was another excellent talk.

The OSSS then held its annual business meeting with its election of new officers with a no host bar and superb refreshments. Josh Owens is our new president. Newly elected were: James Cassidy - Vice President, Sarah Hash - Eastside Director, and Ryan Stewart - Treasurer. Congratulations to the new officers.

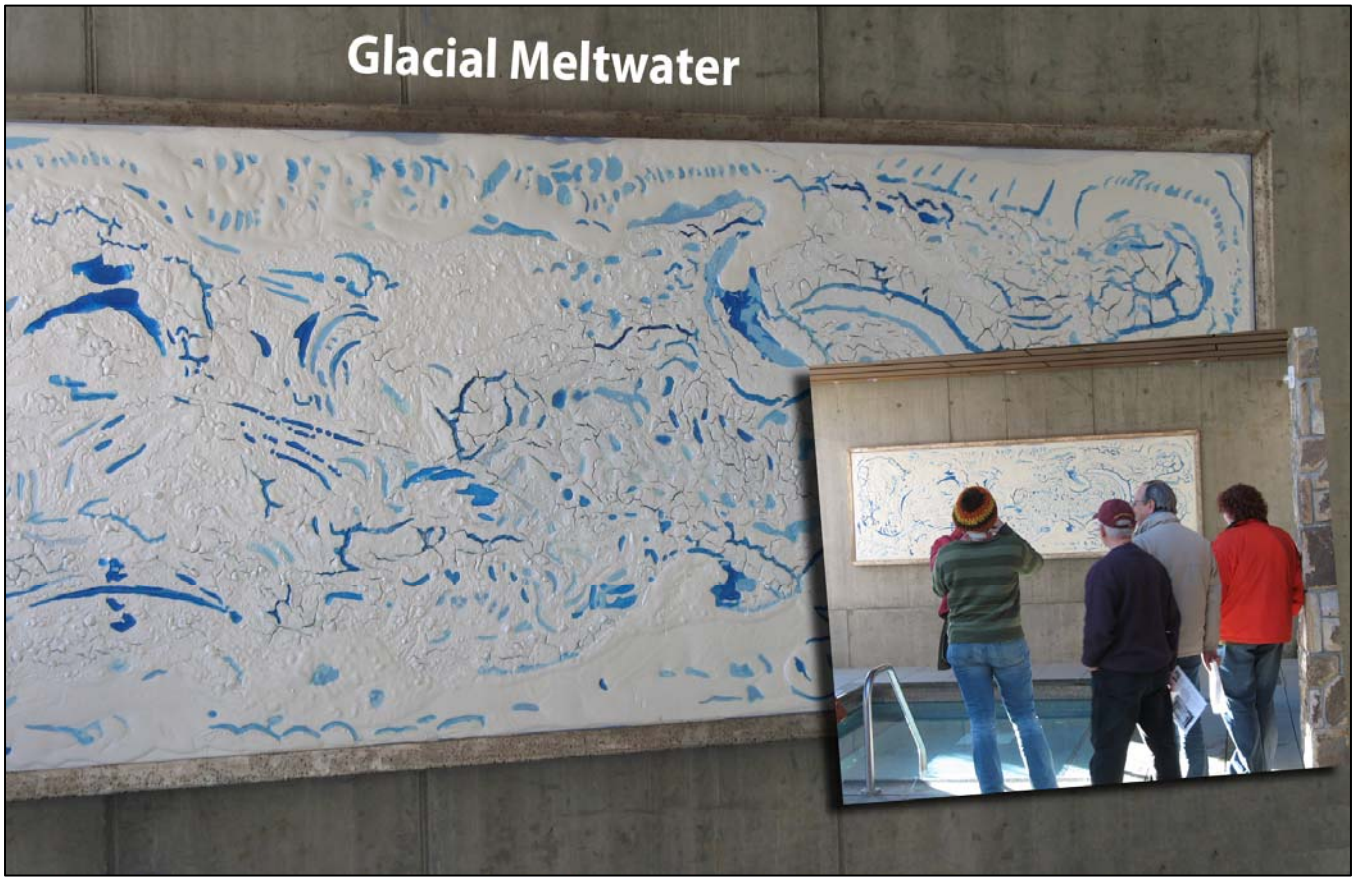
Friday morning produced another round of excellent speakers in Dr. Adam Chambers, from the NRCS West Technical Center, Dr. Stephen Griffith, ARS, and Dr. Sue Grayston, from the University of British Columbia. Dr. Chambers discussed the greenhouse effect and the green house gases (GHG) that create this effect. He steered us to the comet – VR 2.0 program that relates management practices to carbon sequestration (carbon sinks) and GHG emissions. Dr. Griffith from the Ag Research Station lectured us on grass seed production practices in the Willamette Valley to reduce carbon emissions. He talked us through his test plots calculated to account for differences in type of grass, drainage, type of tillage, field burning or not, and changes in residue. Of course, these test plot results affect the usual suspects – carbon sequestration and climate change (is that warming or cooling?). Dr. Grayston followed with her talk on the potential of micro-organisms and fertilization to increase carbon sequestration and associated effects on GHG emissions. She is doing her studies on British Columbia coniferous forests (lodgepole pine, Douglas Fir, Western Hemlock). Generally, scarification and fertilization increases biomass above the ground including the forest floor, but the sequestration effect is uncertain below ground. The chemistry explanations of her studies generally left me in the dust. However, I fully appreciated her tenacity, skill and knowledge in her work.

~ 2011 OSSS Winter Meeting Field Trip ~
Wine Sampling at Sokol Blosser (Jory) and Willakenzie Estate (Willakenzie)
Which soil produces the best wines?

With the core of the meeting over most of the participants elected to depart on the Friday afternoon Field Trip. After collecting our delicious sack lunches and a tour booklet, we boarded a large comfortable bus to take us to the Sokol Blosser winery, the Willakenzie Estate winery, and the Allison Inn and Spa. Dr. Scott Burns energetically led the winery part of the tour with his usual enthusiasm and knowledge of soil, geology and wine. He told us that wine differences depend on 6 factors: Grape variety (even the clone), Climate, Geology and the soil, Hydrology in the soil, Winemaker, and Vineyard techniques. This was our introduction to Terroir or "taste of the place." One of the goals of this field trip was to compare and contrast Pinot Noir wines grown on Jory and Willakenzie soils. Is there a difference? Jory is classified as a Fine, Mixed, active, mesic Xeric Palehuults, which is a highly weathered soil with a low base saturation developed on Columbia River Basalts. Willakenzie is classified as a Fine-loamy, mixed, active, mesic Ultic Haploxeralfs. Compared to Jory, it is less weathered, has a higher base saturation, and is developed on marine sediments. Of course, many wine samples were imbibed and bottles of wine purchased. We found that comparing the wine grown on these two different soils depended on personal taste/experience. The OSSS vote may have been very slightly in favor of Jory. We however may be a little biased as Jory is our selected state soil.

OSSS members viewing soil artwork at the Allison Inn and Spa
Slackwater Terroir
by artist and OSU Soils Professor Jay Noller

Our final stop was at the Allison Inn and Spa near Newberg to view Dr. Jay Noller's fascinating display of Soil and Art. Tracks of Jory and Willakenzie soil were left through the Allison on the way to the pool viewing area. On the north wall was a five panel (quintych = 5 pictures put together) entitled "Slackwater Terroir." The purpose of this piece was to convey cycles of time in returning rhythms of pattern and ordered color, line and texture using soil media in its natural hues. The other piece on the west wall, facing the hot pool was entitled "Glacial Meltwater." The goal of this piece was to convey coolness of color, line and texture using soil and clear sand in glacial hues. "Glacial Meltwater" was inspired by looking at the site of the Allison Inn and Spa deep within the glacial meltwaters of Lake Allison some 15,000 years ago. In both artwork pieces the soil media used contracted during curing to produce cracks and polygonal texture. Thanks Jay for sharing your amazing artwork with us.



Artist Jay Noller's, *Glacial Meltwater*, located at the Allison Inn and Spa

It didn't rain (although it was rather cool) and was a great end to a wonderful OSSS Winter Meeting. Thanks again to Corey and all the helpers and speakers. What a great job!

MEMBER SPOTLIGHT

by Jaimee Davis and Teresa Matteson

Teresa Matteson

Born in Cheyenne, WY, I'm a cowgirl at heart. At the age of 6, my family moved to Oregon where I grew up to wrangle worms, round up weeds, and ride a red bike.

Fascinated by life science, I obtained undergrad degrees, first in Biology (U of O), then Medical Technology (OHSU), and worked in laboratory medicine to eventually settle in clinical microbiology. After 15 years in my first career, I bailed from the hospital realm to stay home with the kids, grow an organic garden, serve as the school science mom, and coordinate a southern Oregon backyard compost education program. Composting became my hobby. I volunteered with the Composting Council of Oregon, attended Biodynamic meetings, built hot piles, and spread black gold to grow killer salsa ingredients.

Teresa demonstrates the use of a soil penetrometer to determine surface and subsurface compaction at Fairfield Farm during the August 2010 Soil Quality Project Workshop field tour.

At the age of 47, I uprooted my family from the Medford area and moved to CorVegas (*Teresa's affectionate nickname for her golden town*) to pursue a Master's in Soil Science at Oregon State University. Research in food waste composting married with scholarly adventures into soil physics, chemistry and biology prepared me for gainful employment as a member of the award-winning Benton SWCD Education and Outreach team. In August 2008, I attended a Soil and Water Conservation Society workshop on Soil Quality, which catalyzed my latest passion to revive regard for soil.

Thanks to an USDA-NRCS Conservation Innovation Grant and support from Benton SWCD, Oregon Tilth, Cornell University, Oregon State University College of Agriculture, and the Benton County Farm Bureau, I've led the Soil Quality Project since 2009. Working with farmers, researchers, students and consultants, we will define an assessment package to help farmers make informed management decisions and promote soil health. The momentum continues to build; Benton SWCD was recently awarded a Western SARE Professional Development Grant that will fund a regional Soil Quality Network and workshops to unite and empower agricultural professionals for improved soil management. SARE is a USDA program = Sustainable Agriculture Research and Education.

Besides that, I'm the luckiest person ever – happily married to Mr. Wonderful for 33 years and mom to the two greatest kids on Earth.

Soil rocks!

OUT OF ORDER 4 – A MYSTERY

by Stan Winther

Sir Crumley's assistant, Gregory Stone, was in the process of reinstating the proper taxonomic order to Sir Crumley's collection of valuable monoliths when he abruptly stopped. A confused expression spread over his face. He turned and ran to the phone.

"Mr. Holmes, Mr. Holmes," said Gregory, gasping for breath into the phone. "I was removing the wood screws from each monolith and was physically carrying each one to its rightful position when I noticed an extra monolith amongst the other 12 monoliths. It was labeled 'Urbisols.' Needless to say urbisols is not an official soil order. First, Frederick had copied and sold the displayed monoliths. Then Sir Crumley was killed while Azi was trying to reclaim his holy profile. Finally, Mr. Don Clark pleaded guilty to alphabetizing the monoliths. And now this… I simply can not discard this profile. It might, indeed, be the next soil order."

Overhearing the conversation, Dr. Watson asked, "What is an Urbisol?" as Holmes hung up the phone.

Holmes replied with, "An Urbisol is a proposed soil order in which the surface horizon has been altered by heavy equipment in an effort to form a flat soil surface. A good example of this is a caterpillar-bladed construction site." Holmes quickly diagrammed on a piece of paper how the new Urbisol would look in soil taxonomy for Watson to see.

Order: Urbisols – (altered surface horizons)
- Suborder: Sub/urbs - (if the surface layer was removed)
  - Great groups: Pre/sub/urbs – before construction – (wet bordering on mucky)
  - Great groups: Post/sub/urbs – after construction - (dry bordering on dusty)
- Suborder: Sup/urbs - (if the original surface was covered over with a new soil layer)
  - Great groups: Aqui/sup/urbs – (supurbs over swampland)
  - Great groups: Lithic/sup/urbs – (supurbs over bedrock)
  - Great groups: Pachic/sup/urbs – (supurbs over parking lots)
  - Great groups: Adobe/sup/urbs – (supurbs over heavy clay)
  - Great groups: Haplo/sup/urbs – (supurbs over farmland)

"This new soil order, referred to by some as the Cover-up soil order, would be especially useful in urban areas where concrete and fill material have covered the soil for decades and a soil update was long overdue. Therefore, a typical polygon in the city would be a rectangle. The diagnostic horizon intended for an urbisol would be an abrupt soil boundary *with* imprints of a large tire tread."

"Holmes, you amaze me," exclaimed Watson. "How did you know all this?"

"I read it in the last issue of the *Sharpshooter Newsletter*," said Holmes. "After my speech at the OSSS meeting, I was finally placed on their subscription list. Because their slush fund was spent, I was given a lifetime membership, which includes the newsletter and as an added bonus they gave me a personalized key to the men's restroom."

"Remarkable!" said Watson.

The next day Holmes and Watson went to the museum to meet with Gregory to view the new soil order monolith. Holmes had brought his soil describing kit. After a quick scan of the monolith, he laid out his color book, large knife, tape measure, horizon screws, magnifying glass, sample bags, and water bottle around himself and began to examine the profile. Watson took notes. In addition, Sedgwick took a "plaster of paris" cast of the tire tread from the surface horizon. His conclusion? The monolith was a suburb but the tread was almost smooth, which would be difficult to trace. Furthermore, Gregory stated that all of the committee members did have a backhoe tractor at their disposal.

A few days later Sedgwick met with Lord Wilson. Lord Wilson was a foreign correspondent covering international affairs for the OSSS in London. He stated that it was common knowledge that Sir Crumley would block any attempt to establish a 13th soil order. Lord Wilson explained that each year Sir Crumley published a wildly popular wall calendar featuring a different soil order for each month. Thus Sir Crumley worried that a 13th soil order would be established soon over his objection and then what would happen to his 12-month calendar? On the other hand, Sir Crumley was instrumental in accepting the 12th soil order of Gelisols because this would allow for a 12-month calendar.

But who had a sufficient reason and power to insert another soil order into soil taxonomy over Sir Crumley's objection? Sedgwick decided to interview each member of the International Committee separately and he learned the following:

- Sir Crumley's mistress, Lady Simpson, wished to rid the house of the dusty monoliths with their spider webs and bring in famous paintings. She suggested that if Sir Crumley must have his "precious" monoliths on display, that he should employ an artist to paint the monoliths onto canvas and place the true profiles down in the basement. Crumley totally discarded her idea.

- Leroy, "the nephew," who was actually the illegitimate son of Sir Crumley and Lady Simpson, wanted to follow in his father's footsteps and be a great soil scientist (namely, a pedologist). To do so, he had to rise above the other surveyors. One way to do this was to find the elusive "False Bottom soil." It was both a very deep and a shallow soil at the same time. A very rare soil! He was told that if he truly was serious, he must organize a safari and journey to distant Eastern Oregon where the horizontal basalt flows are beautifully displayed in the canyon walls. It is these basalt flows that would have soil above and below the rock layer.

  Even though Leroy begged, Sir Crumley refused to supply him with enough dynamite to blow up many of these sites. Creating large craters would give an instantaneous profile as well as room for a soil review party.

- Gerald Millison, the auctioneer. His only hobby was collecting old, signed copies of "Keys to Soil Taxonomy." He mostly treasured those copies autographed as "Soil Survey Staff." It seems that so many people have contributed to the book that no one individual took credit for its authorship. He obviously disposed of any copy signed as "Fred Staff," "Falstaff," "staph infection," or the like. He had all 10 editions except for the first issue. Sir Crumley had it and had refused all of Millison's offers.

- Leslie Wilkinson, a committee member, wanted to honor Sir Crumley by naming a soil after him. Unfortunately, Sir Crumley's birthday had just past and Wilkinson would have to wait for another year to bestow the honor. In the meantime, Idaho had grabbed the name first. Wilkinson had no choice but to alter the Crumley name to avoid the conflict. Thus, "Crumley" became "Crimply." Sir Crumley was outraged.

- Benson Driskoll, tax attorney, was concerned by all the money generated by Sir Crumley's calendar. He wanted to offset those gains with losses for tax purposes. One way was to buy all the old paper copies of past soil survey reports. Frequently they were stored in the basements of old courthouse buildings.

- Gregory Stone had been a member of the soil judging team. He was recruited directly out of preparatory school into the state university. It was during competition with the cross town rivals that he pulled a muscle in his texturing thumb. He was rushed to the hospital where his thumb was placed in a cast and then his arm into a sling. Now when he raises his hand, it appears he is hitchhiking.

- Russel Kingsley was a contractor and felt that soil surveys and classifications were a waste of time and money. Furthermore, if there were soil obstacles in his way, then his D8 caterpillar could handle it. He simply told his clients to point the way and then stand back. He was on the committee because a judge decreed he had to do so many hours of community service or go to jail for putting a road through Stonehenge.

"Well, Holmes. That is all very interesting, but who did try to insert another soil order into soil taxonomy?" asked Watson.

"Elementary, my dear Watson. I simply went to the museum's motor pool and inquired about any unusual tire changes in the recent past from the mechanic in charge. He said that Millison stopped by one morning and insisted that his new tires be replaced with balding tires because he would be working in a clay soil. Millison explained that the clay would immediately pack and adhere to tires with deep tread and cause the tire to slip and hydroplane on the sticky clay. A few days later he returned with the tractor and the tires were switched back.

"When I confronted Millison, he tried to deny digging a soil pit, gluing the soil to the board, and then placing the Urbisol profile in amongst the other soil profiles but the evidence was overwhelming. He finally confessed, stating he meant no harm, but a new soil order was necessary to handle all the urban areas in the world. Reluctantly he agreed to help but only after he obtained the first edition to 'Keys' from Sir Crumley's estate.

It was then I had to reveal that the first edition was written on a napkin and later disposed of. Millison was crushed and was of no further use.

"But did Millison act alone?" Holmes continued. "I think not. Of course, the Committee disliked Sir Crumley, but they refused to get involved. Millison was a useful tool to someone. So who then? There were several possibilities:

- "It might have been the people at the NRCS. They were already publishing a 13-month activities calendar. Sadly the NRCS was having trouble meeting its work load, so they simply supported the establishment of any new soil order that automatically extended the work year.

- "It could have been members of the OSSS. The truth is that the OSSS had been using urbisols for years, but the International Committee refused to recognize the new order. If the new Urbisols was not adopted, then the OSSS must revert back to the old classifications such as, mallxeralfs, condoxerolls, schoolxererts, etc. within urban areas.

- "And don't ignore the members of the National Organization of Retired Soil Surveyors who were becoming increasingly bored with all their leisure time. Occasionally they would gather in small groups by an open pit and nostalgically look over the edge. For their own safety, OSHA would order them to disperse if too many of them climbed into the pit at the same time. With a new soil order, much new work would be generated."

"Well, how did you deduce the matter?" asked Watson.

"Fortunately, little deduction was necessary. One day I decided to visit the Soils Park across the street from the Museum and enjoy the view and the sun. As I strolled around the huge textural triangle hovering over the lawn, I noticed many footprints at the "silt" corner of the triangle. Then a scrap of paper caught my eye. It was receipt for a small sum of money to Mr. Millison from the OSSS. Now I had proof as to the OSSS's involvement. As for the many footprints, the OSSS likes to do everything as a group. I believe this puts to rest the 'out-of-order' mysteries."

Just one more thing, Holmes. If Urbisols were accepted into soil taxonomy, where would it be placed?" asked Watson.

"Good question. Keep in mind that an abrupt soil boundary can be the result of man or nature. To be sure that manmade activities upon soils are set apart from the forces of nature such as ash fall, landslides, river deposits, etc., Urbisols, with all of man's impacts, must be recognized first in taxonomy. You must remember, my dear Watson, man always comes first!"

DATES TO REMEMBER

May 22-26, 2011: National Society of Consulting Soil Scientists: 24th Annual Meeting, Asheville, NC; to be held jointly with the National Cooperative Soil Survey. Visit their web site for more information: http://www.nscss.org/

July 29-30, 2011: California Forest Soils Council Field Tour – Mt. Shasta City, CA. Visit their web page for the latest information: http://www.caforestsoils.org/summer-field-tour/

August 5-6, 2011: Oregon Society of Soil Scientists 2011 Summer Tour: Klamath Falls Area. For the latest information visit the OSSS web site at: http://www.oregonsoils.org/?page_id=5

August 16-18, 2011: Northwest Forest Soils Council Summer Field Tour: "Rapid Watershed Assessment Based on Soil Information." Meadow Creek Watershed, Southwest of LaGrande, OR. Contact Shannon.berch@gov.bc.ca or visit http://www.oregonsoils.org/?p=619 for more information

October 16-19, 2011: ASA-CSSA-SSSA 2011 International Annual Meeting: "Fundamental for Life: Soil, Crop, & Environmental Sciences," San Antonio, TX. Visit their meetings page for the latest information: https://www.soils.org/meetings

Stevens Hydra Probe Soil Sensor

All in one multi-parameter soil sensor

The Stevens Hydra Probe soil sensor is the most robust and unique soil sensor available. Users can select up to 22 parameters, including:

- Soil Moisture
- Soil Temperature
- Soil Electrical Conductivity
- Real and Imaginary Dielectric Permittivity
- and many more!

Features of the Stevens Hydra Probe

- Extensively researched and well-tested, durable design provides quality data over many years without removal or recalibration
- Over 10 years of field use
- Excellent precision and accuracy
- Temperature corrected measurements
- Smart Sensor technology
- No calibration required for most soils
- SDI-12 or RS-485 signal output

Over 100 universities, government agencies (USDA, USGS, NOAA, DOD, NASA), farms, vineyards and other companies use the Hydra Probe for quality data analysis!

The POGO portable multi-parameter soil sensor - just poke and go!

The POGO portable soil sensor enables manual readings to be taken quickly and easily. Simply insert the Hydra Probe into the soil you wish to sample, select the soil type and user defined location, and click "Sample" on the PDA's screen. The soil measurements can be logged to the PDA for further analysis via *MS Excel* or other spreadsheet programs.

The POGO enables immediate understanding of soil conditions for agriculture, greenhouse monitoring, research, golf course greens, ground penetrating radar studies or any other application that requires manual checking of soil conditions at multiple locations.

Data Loggers

Water Level & Quality

Radio Telemetry

Weather Sensors

Tel: 800.452.5272
503.445.8000
Web: www.stevenswater.com

Monitoring the Earth's Water Resources Since 1911

Stevens®
Water Monitoring Systems, Inc.

Sharpshooter

The *Sharpshooter* is the official newsletter distributed to the members of the Oregon Society of Soil Scientists. Published quarterly by the Oregon Society of Soil Scientists. Address changes or inquiries about membership to:

OSSS
Box 2382
Corvallis, OR 97339

Website and email address:
http://www.oregonsoils.org

Advertisements

Reach more than a hundred soil science professionals with an advertisement in the *Sharpshooter*. And the price is right—whole page $45, 1/2 page $25, 1/4 page $15, or 1/6 page $10. All you need to do is provide a disk and hard copy to the *Sharpshooter* editor by the deadline (first of the month – January, March, June, and November).

All articles and advertisements submitted are subject to room available basis.

News items

Remember all articles submitted to the *Sharpshooter* can be emailed to the Sharpshooter editor at e2horn@gmail.com in most any text, http, or word processing format. Pictures are best in 300 dpi jpg format.

Member rates

$ 30.00	Regular member
18.00	Associate member
35.00	Sustaining member
10.00	Student member
300.00	Lifetime member

SHARPSHOOTER
OREGON SOCIETY OF SOIL SCIENTISTS

OREGON SOCIETY OF SOIL SCIENTISTS
P.O. Box 2382 • Corvallis, OR 97339