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The Coastal Plainer

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Points from Puckett

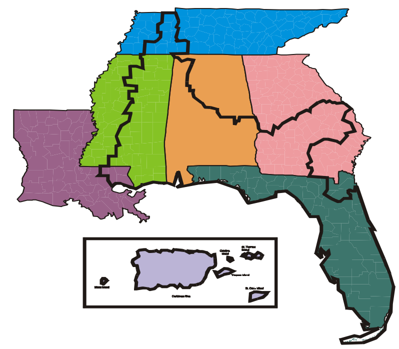
by William E. Puckett, SSS/MO-15 Team Leader, Auburn, AL

I attended the State Soil Scientists Meeting in Lawrence, Kansas, the week of March 19, 2001. It was one of the best meetings I have been to in a long time. The agenda was well put together and many new ideas and technologies were presented. A lot of time and effort was spent talking about NASIS and the conversion to NASIS 5.0 this month.

There's hope that once NASIS is migrated from the MO's to a central server in Ft. Collins that it will run faster and be more efficient for use by the field soil scientists. Preliminary tests of the central server have been promising; MO 15 should be up and running via the central server by mid to late spring. Soil survey offices will need new passwords and security software to access the server.

There were several demonstrations and talks on new technologies. The most intriguing was a presentation

MLRA Soil Survey
Region #15



by Earth Information Technologies concerning a new probe that when inserted into the ground could determine the textures and colors of the soil. The technology is still in its infancy, but image the possibilities? Another talk by the same company involved creating virtual soil landscapes. It was cool but I am not sure I get it.

There were also lots of demonstrations by various States showing the latest and greatest products and marketing tools they had developed. I never knew you could develop so many different kinds of bookmarks based on soils. Items ranged from posters and calendars to CD's and videos.

The folks from Oklahoma demonstrated their new CD version of the Oklahoma County Soil Survey. What was unique about their approach to the survey was that they had segmented the soil survey maps into 120 8 1/2 x 11 inch sheets for the entire county. By doing this, anyone with a computer and standard printer could print the survey sheets they needed. I know it doesn't sound like a big deal but it is a first step in overcoming some of the publishing issues and problems we currently have.

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In This Issue:

Soil Interpretation in the Soil Survey – Past and Present

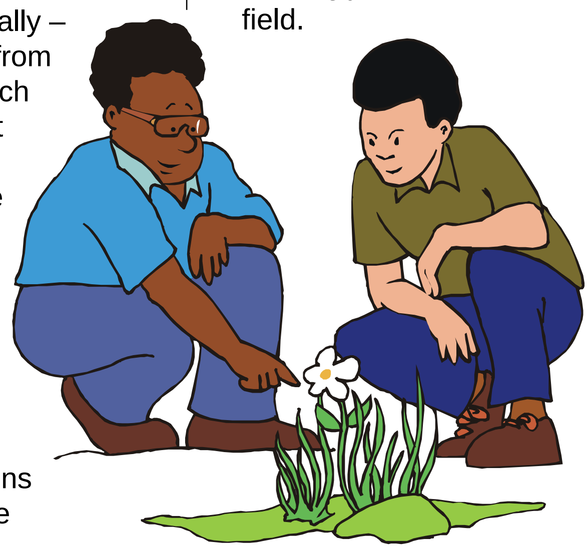
by Berman D. Hudson, National Leader, Soil Survey Interpretations and Acting National Leader, Soil Classification & Standards

During much of its history, the Soil Survey has had an "on again/off again" relationship with interpretations. During its first decade, the Soil Survey leadership emphasized their importance. Milton Whitney asserted in a 1906 speech, "…we knew that we must be able to interpret the soils we mapped or there would be little excuse for the Soil Survey." However, Whitney soon changed his tune. In 1914, he wrote in a letter that the purpose of the Soil Survey was limited to "… the gathering of fundamental soil information to be used as a basis for experimental work by other bureaus or offices." This view was later reinforced by Curtis Marbut, who wrote in 1924, "… the soil survey is being regarded more and more as a scientific publication and should not attempt to give practical advice."

This neglect of soil survey interpretations changed drastically when Charles Kellogg took over the Soil Survey in 1935. According to one author, "Soil survey interpretation, after a lapse of twenty years, again became recognized as an essential … function of the Soil Survey." Kellogg wrote in 1949: "Of course, soil surveys made for predictions about land-use and management … must be practical. But they will not be practical unless they are also scientifically sound." Under Kellogg's direction, numerous engineering interpretations were developed and soil surveys of urbanized areas were begun. Computerized procedures (e.g., the SOI-5 and SOI-6) were utilized to interpret soils consistently nationwide and to generate interpretive tables for soil survey manuscripts.

Providing computerized interpretations from a central source (the Statistical Laboratory at Ames, Iowa) provided consistency and increased the efficiency of manuscript publication. However, it had a downside. This process prevented field soil scientists from having a meaningful role in interpreting soils. It is hoped that the advent of the National Soil Information System (NASIS) will enable us to correct this. Specifically – we hope to change from a "top down" approach to one in which most soil interpretations are developed at the state or local level. In this scenario, interpretation specialists at the National Soil Survey Center (NSSC) will develop national interpretations or templates. Where appropriate, these national templates can be used unchanged at the local level. The national templates also can be modified to produce local interpretations that more closely reflect the laws, available technology and economic conditions at the state or local level. Additionally, we encourage local soil scientists to develop totally new interpretations for which no national templates exist.

Interpretation specialists at the NSSC will continue to have an important role in developing national templates. They also will conduct research and development in the science and practice of soil interpretation (for example, the application of fuzzy set theory). A third important role will be to provide training and consulting services to the field. However, interpretation specialists at the NSSC will play only a supporting role. The actual process of developing soil interpretations and providing them to users will increasingly be done in the field.



The Boomerang! Effect

by Warren Henderson, State Soil Scientist, Gainesville, FL

For almost a decade our soil scientists have spent countless hours providing technical services to a wide variety of customers throughout the state. Most of the requests were through local Soil and Water Conservation Districts. We've often heard soil scientists say that a resource soil scientist position is one of the best and most rewarding jobs in the agency. Phrases like, "I'm my own boss" and "I don't have to map anymore," are thought to be the reasons why resource soil scientist positions are so appealing to those who serve in them. Well, in Florida the "Boomerang Effect" is presently taking place and most of our resource soil scientists are mapping again—not in the project surveys, because the first generation or "the once over" was recently completed. However, we have five outdated surveys which will require some ground truth. We must verify and reclassify a number of soils, place the polygons on new imagery, rewrite the manuscripts, and prepare new interpretative tables to accommodate the needs of the users.

We have had updates of other outdated surveys, but those were at the request of the local county governments who provided funds to the former Soil Conservation Service. At that time, there was a full cadre of soil scientists from nearby counties to do the work. My, how things have changed. We now have a relatively small staff and the only funding which will support the updates will come from our CO-02 allowance from the agency. The local units of government have been trying to secure funds to accelerate the updates, but local and state funds are not available because of other priorities for their budgets.

The soil scientists in Florida have very good attitudes about working as a team to get the work completed. They are conscientious about doing a quality job to improve what is in the outdated surveys. I scheduled a little field time to ground truth some of the old mapping with the Pinellas County team and was very pleased to find the "truth". The soil scientists from the good ole days did quality work just like we expect from our soil scientists of today. The soil names may change and interpretations may need to be modified a little but the lines in many instances are as good as they were 30 to 35 years ago. Of course, there will be a lot more urban units shown in the Pinellas County update than in most of the other more rural counties.

The challenge is upon us, but with the help of the MO Staff, we will rise to the occasion and get the updates completed so that our remaining soil scientists can get back to providing more technical services to our customers. The boomerang will have made a full circle for some who started their mapping debut at about the time the field work for the first survey of Pinellas County was ending.

NASIS Version [(2*17)+1]/7

by Scott Anderson, Soil Data Quality Specialist, Auburn, AL

We will soon have a very expensive door stop here at MO-15. The HP computer, which has supported NASIS over the last five years, is no longer needed. MO-15 will soon be converted to NASIS version [(2*17)+1]/7, the "Central Server". When this happens, all of us will be on equal footing. In other words, all of us, even those of us here at the MO, will be remote NASIS users.

During the month of April, NASIS databases from all the MOs will be combined into a single database at the Information Technology Center (ITC) at Fort Collins, CO. This new central server will provide newer and faster computer servers, improved database security, better access for non-NRCS users, and will eliminate the burden of NASIS computer maintenance from the MO. Soil survey project offices should also see an increase in processing speed as compared to the old system.

NASIS [(2*17)+1]/7 can be run from the same PC you have been using. As part of the new security system, we will now be logging into a Secure Shell, an encrypted channel to the NASIS server, before starting a NASIS session.

This Secure Shell will allow NASIS to be accessed from both USDA and non-USDA users without compromising security. Each user will be issued a unique Secure Shell password. More information will be provided once conversion has taken place.

MO-15 is scheduled for conversion starting April 18th. The process will take about five days to complete. You will not be able to access NASIS during this time. After conversion we will provide assistance and training as needed to get our users back in the NASIS saddle.

NOTE: Formula in title equals NASIS Version 5

The Changing Landscape NRI Data

Acres and Percent of Developed Land 1992-1997 that was Prime Farmland in 1992, and Average Annual Acres of Prime Farmland Developed 1992-1997, by States within MLRA Soil Survey Region #15

State	Total Land Developed 1992-1997 (1000 Acres)	Prime Farmland Converted to Developed Land 1992-1997 (1000 Acres)	Percent of Total Land Developed 1992-1997 that was Prime Farmland	Average Annual Rate of Conversion of Prime Farmland to Developed Land 1992-1997 (1000 acres/year)
Alabama	315.3	113.8	36.1	22.8
Florida	825.2	15.2	1.8	3.0
Georgia	851.9	184.0	21.6	36.8
Louisiana	133.6	83.7	62.6	16.7
Mississippi	206.4	84.8	41.1	17.0
Tennessee	401.9	124.0	30.9	24.8
Puerto Rico	112.4	19.1	17.0	3.8

An Ag Mission To Venezuela

by Eddie Jolley, District Conservationist, Opelika Field Office, AL

Once I learned of the agricultural related mission trip to Merida, Venezuela, I knew that I would have my first opportunity to serve in overseas missions. In addition, I was going to have the opportunity to use my expertise in natural resource conservation.

In January, Dr. Charles Elkins, retired USDA Soil Scientist, and I were going to tag-team and teach other missionaries how to use the soil quality kit that Mike Hubbs (Soil Quality Institute) had refined.

We were upset to find that the soil kit never left the Atlanta airport. Never fear, besides our knowledge and experience, we knew that the trip would be successful, perhaps not by our standards but by our Maker's standards—and it was!

We met with local farmers to discuss agriculture in general and to make recommendations that should make significant impacts to their operations. First, we dug a few holes to check on soil conditions. The soils were very deep—from 20 feet to 200 feet deep, without obvious horizons. The soils were gravelly silt loam and high in organic matter. This area is in the Andes Mountains around 10,000 feet above sea level. The soils were actually of glacial origin. Imagine that, glaciers this near the equator.

Venezuela's Andes Mountain Agriculture

The land would not be farmed in the USA, but in Venezuela, these 30% to 60% slopes were being intensively farmed with garlic, carrots, potatoes, wheat, and corn. The soil was definitely eroding, but because the soil is so deep, the people really did not care. Gullies abounded. More than 75% of the cropland was farmed with oxen or by hand. On the eastern side of these mountains the terrain was different. It had more trees. Crops like broccoli, cauliflower, radish, squash, and ornamental flowers abounded. These two regions produce about 80% of the vegetables eaten in Venezuela.

Water is a precious resource to these people. On the western side of these mountains, the semi-arid region, the annual rainfall is about 30 inches.. On the eastern side, the rainfall is better in distribution and amounts. The mountains are full of springs, however. Some years earlier, a group of Australians had worked with these people to develop a system of collection tanks. The piped water is stored and released as needed through irrigation pipes to sprinklers located in the fields. The sprinklers operate well because there is enough head pressure. The landscape is covered with irrigation pipes.

Through interpreters we discussed ways to make economical improvements with the local farmers and agricultural representatives. Suggestions included:

- soil testing followed by proper fertilizer and lime application (on average 100 pounds of goat manure is applied to 4 square meters each year);
- developing a suitable cover crop, such as clover, for the idle lands (there were many idle fields with minimal cover);

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Jolley, Continued from page 5

- using more contour farming (most work was done up and down hill);
- working with local experts to develop ways to use conservation tillage (we had information to give them about manual and animal-drawn conservation tillage planters);
- developing suitable grasses for the livestock (the cows and oxen were very thin); and,
- using grassed buffers and terraces along with annual cover crops.

Does any of this sound familiar?

Asked if I would go back, the answer is definitely, yes. These people can use our help. It has even been suggested that a two-year stint might be appropriate—well, the Lord only knows the answer to that!

Think about this--

Get rid of the word "but." Any time you say "but" you're really saying you disagree. Instead, try using "and" to pave the way toward agreement.

Example: Instead of "I see your point but I'd like to give it more thought," try "I see your point and I'd like to give it more thought."

Natural Soil Landscape Position Database Reclass

by Ken Liudahl, Resource Soil Scientist, West Palm Beach, FL

The Natural Soil Landscape Position (NSLP) database is a reclassification of 19 digital county soil surveys based on major landscape types found in South Florida. Nine hundred and nine (909) soil map units were reclassified into nine natural soil landscape positions (tidal, marl and rocky, everglades peat, muck depressions, sand depressions, flats or sloughs, flatwoods, knolls, central ridge and dunes) and three other areas (water, urban/man made lands, and a no data area) for a total of 12 landscape positions. These positions are simple landscapes that are encountered as one walks across the land and observes adjacent landscapes. The tabular database, consisting of 32 soil parameters, drives each map unit into its appropriate landscape position or geomorphic setting and sets up the NSLP category reclass.

My objectives for developing the NSLP database were to; (1) simplify the use and management of the large digital county soil survey files, (2) simplify the use of the detailed county soil survey map units by developing unique landscape phases that each soil map unit is formed on, (3) keep the data integrity of each map unit by correlating each unit into its geomorphic position, (4) create a seamless digital soil survey across county boundaries within the SFWMD, and (5) simplify the soil, water, vegetative community relationship or interface by creating one soil tabular database that addresses these relationships. I believe the database has accomplished these objectives. The database provides digital information in a user-friendly format. The NSLP reclass offers the benefit of a seamless soil spatial layer for south Florida within a GIS system.

The Natural Soil Landscape Position database provides resource managers, planners, and modelers with an interpretation of soils not available from other spatial sources.

The NSLP reclass defines a hydrological gradient from lower wetter landscapes to upper drier landscapes and is useful for understanding natural relationships between adjacent landscapes as well as patterns of hydrological and topographical gradients. Spatial maps, such as National Wetland Inventory, USGS topography and hydrology, and thematic mapper satellite images, are compared to the

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NSLP layer. One of the products of the NSLP database is a poster, funded by EPA that the South Florida Water Management District (SFWMD) staff and I developed. The poster serves as an educational tool. It demonstrates to various disciplines that have not used soil data before the value and reliability of soil data for GIS planning and modeling applications.

The NSLP contract and database product is the fifth contract or cooperative agreement that I have written and completed with the SFWMD. This partnership has rewarded the NRCS with $631,000 and has been instrumental in marketing the multi-discipline use of soil data.

The Natural Soil Landscape Position database provides resource managers, planners, and modelers with an interpretation of soils not available from other spatial sources. Because the soil data has been reclassed as geomorphic soil landscapes, relative topography and regional patterns of surface and groundwater patterns become evident. Correlation of hydrological conditions to ecological communities allows the soils data to be used to visualize the extent of certain habitats.

Information about the NSLP project and data is available on a web page at www.sfwmd.gov/org/pld/proj/wetcons, then clink on NSLP.

Atrazine Movement in a Loessial Soil Under Two Tillage Practices

by Alton B. Johnson, Assistant Professor of Soil Physics, Alcorn State University, MS

Many farmers are adopting conservation tillage practices as important methods of crop production because conventional tillage (CT) practices have been associated with excessive soil erosion, nutrient loss by runoff and relatively high energy costs. Conservation tillage systems allow crop residues to be left on the soil surface to conserve soil water and reduce soil erosion. One type of conservation tillage with relatively minimum soil disturbance is the no-till (NT) system. Under an NT crop production system, macropores develop as a result of channeling by plant roots, earthworms, or soil shrinkage cracks. Herbicides are usually applied under NT practices to control weeds or winter covers. Timing of rainfall prior to application is a key factor in herbicide transport. When sufficient rainfall occurs, infiltration under NT condition is often higher than CT. This increases the potential for shallow ground water loading due to movement through preferential paths in the soil profile.

Herbicide contamination of ground water has become a major concern in recent years. The concern is due to the health hazards associated with the entry of these chemicals into the food chain of animals and humans. One commonly used herbicide for corn (*Zea mays L.*) production in the Southern Mississippi Valley is atrazine [2-chloro-N-ethyl-N-(1-methylethyl)-1,3,5-trazine-2,4-diamine]. This herbicide is used to control most small-seeded annual weeds and grasses; however, it is considered to be relatively mobile in soils.

Much of the drinking water in Mississippi comes from wells in shallow aquifers that may be affected by loading of herbicides from agricultural practices. Little information and understanding exist on tillage effects on atrazine transport in the Mississippi Valley and Silty Uplands. The objective of this study was to assess and model the movement of atrazine

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in a common soil in the Mississippi Valley and Silty Uplands under two tillage practices.

Miscible displacement experiments were conducted on intact soil columns under saturated condition to quantify transport parameters of atrazine. The soil under study was Memphis silt loam (Fine-silty, mixed, thermic Typic Hapludalf). Atrazine adsorption was described by the Freundlich isotherm. Average distribution coefficient was higher (1.272 cm^3 kg^{-1}) in NT than CT (1.021 cm^3 kg^{-1}), but showed no significant difference. Batch retardation factors (R) for both CT and NT were about twice the simulated R values. A nonlinear least-square program (CXTFIT) was used to fit a two-region physical nonequilibrium model to the experimental data. Average dispersion coefficient of a nonreactive bromide for CT was 6 times lower than for NT. Average atrazine eluded in the NT system was 1.2 times higher than in the CT system. Average pulse duration (t_p) was1.5 times higher for CT than NT. Atrazine breakthrough curves for the NT soil columns were more asymmetrical and longer tailing, indicating preferential flow in the no-till system. The physical nonequilibrium model better predicted preferential atrazine transport when atrazine retardation was predicted.

Updated MO-15 Personnel Directory available at:

http://www.ga.nrcs.usda.gov/mlra15/MO15Dir.pdf

MLRA Region #15
Personnel Directory

Serving portions of:
Alabama
Caribbean
Florida
Georgia
Louisiana
Mississippi
Tennessee

USDA

Updated: 3/09/01

Natural Resources Conservation Service

Puckett, Continued from page 1

It was a great meeting and there was more than I can share in the space provided in this newsletter. There were several action items that resulted from this meeting and we will send them out soon. By the way, not only were State Soil Scientists at this meeting but Data Quality Specialists from all the MO's also attended and participated in their own work session. They too had a long action item list and we will also share that when it becomes available.