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The Coastal Plainer

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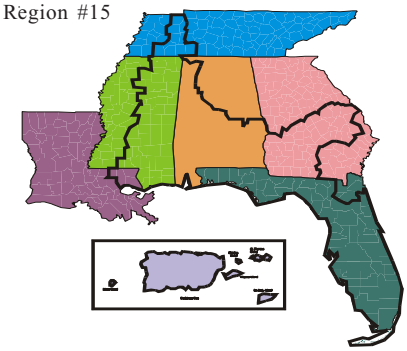
Message from the MO–Leader's Desk

By Charles Love, MO–15 Team Leader

Again, greetings everyone!

I want to say thanks to our soil scientists, support team members, and state soil scientists for achieving, and in some cases exceeding, the PRS goals for soil survey in the MO–15 region during fiscal year 2007. The fiscal year was very exciting and productive. We were able to have two soil scientists detailed into the region (from Arkansas and Indiana) to accelerate initial soil survey mapping and about 10 soil scientists detailed within the region. Their efforts will definitely help us complete our goals for initial soil survey mapping of non-federal and Native American lands by 2011. Currently, about 2.8 million acres is left to map within the region.

MLRA Soil Survey Region #15



It's my understanding that in the future the states will receive their CO–02 budget allocation based on the number of MLRA SSAOs they are assigned to establish and host.

Our remaining initial soil surveys should be done parallel with implementation of the MLRA concept. Special thanks to the personnel in those survey areas that are applying the MLRA concept as a part of their initial soil survey mapping efforts. The MLRA approach utilizes existing pedon-description type locations, historical lab data and transect documentation, and new technologies for progressive digital map compilation. This approach increases efficiency and accelerates soil survey correlation activities.

We are working hard to develop and refine the business requirements for MO–15 for fiscal year 2008. One of our essential goals is to continue to achieve the requirements of the Major Land Resource Area Soil Survey Restructuring Plan, which is outlined in National Bulletin 430–7–2. The plan calls for the establishment of nine MLRA Soil Survey Area Offices (SSAOs) in the region by 2009. Our board of directors continues to move forward with the establishment of these SSAOs. To meet our overall business goals, we need to keep pace with the national soil survey restructuring plan as well as our regional plan. Nationally, about 73 percent of the MLRA SSAOs have been

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established. It's my understanding that in the future the states will receive their CO–02 budget allocation based on the number of MLRA SSAOs they are assigned to establish and host.

The National Cartography and Geospatial Center has provided five geospatial layers to the MOs for distribution to the SSAOs. The layers are orthoimagery, SSURGO, transportation and roads, 1:24,000 hydrography, and elevation. These data layers will be housed at the SSAOs on HPxw8400 geospatial workstations and will assist with current and future geographic soil survey activities. In the MO–15 region, we will be distributing these spatial data layers to our state soil scientists and the SSAOs within a few weeks. These layers will allow for GIS analysis on local geospatial workstations and will be essential for completing our initial soil survey mapping. They will also be crucial for conducting an accurate soil survey evaluation, which will be used for developing future SSAO project work plans. The work plans are used for carrying out soil survey update and maintenance activities. As you start working with these geospatial data layers and begin having questions, please contact Joe Norris, MO–15 GIS specialist, at (334) 887–4556.

As always, thank you for your support. ■

Charles

Advantages of LiDAR vs. Conventional Elevation Models

By Joe Gardinski, Eddie Davis, Justin Bender, and Doug Clendenon; NRCS Huntsville, AL

What is LiDAR?

LiDAR stands for Light Detection and Ranging. It has resulted in faster, cheaper, and more accurate data. Because of the agency-wide availability of GIS software, LiDAR has considerable potential application for detailed conservation planning and resource inventory work throughout the agency.

"I was amazed at the detail and accuracy available with the LiDAR data. Landform breaks were easily discernable and always matched correctly when checked in the field. I have used DEMs with 3-meter and 1.5-meter resolution doing update work in Indiana; and while helpful, a complete delineation of the landforms could not be made from these. I believe this product greatly improves the efficiency of the mapping process and accuracy of the soil survey. I am glad to have worked with LiDAR during my detail to Alabama and hope this resource will be available for future soil surveys."

—Justin Bender
NRCS Soil Scientist
June 2007

On a functional level, LiDAR is typically defined as the integration of three technologies into a single system capable of acquiring data to produce accurate digital elevation models (DEMs). The technologies are: lasers, the Global Positioning System (GPS), and Inertial Navigation Systems. Combined, they allow a high degree of accuracy in the positioning of the footprint of a laser beam as it hits an object. Lasers by themselves have very accurate ranging capabilities. They can measure distances accurate to a few centimeters. The accuracy limitations of LiDAR systems are due primarily to the GPS and IMU (Inertial Measurement Unit) components. Advancements in commercially available GPS and IMU have made it possible to obtain an increasingly high degree of accuracy using LiDAR from moving platforms, such as aircraft.

Pre-Mapping

The higher resolution, more detailed surfaces generated by LiDAR can detect subtle changes in the landscape because the post spacing is

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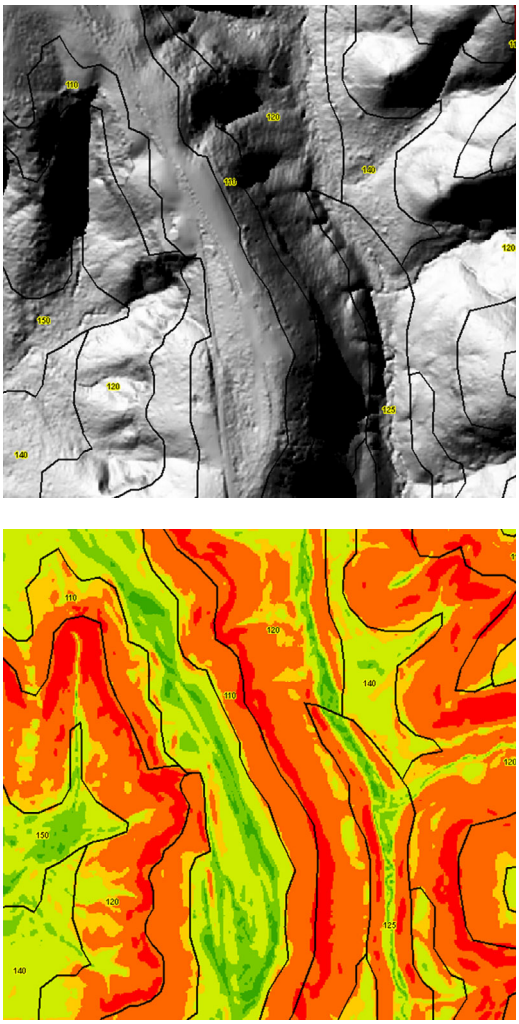
LiDAR, continued from page 2

more intense than with traditional methods.

During pre-mapping, LiDAR:
- Allows soil scientists to digitally map visual landform segments with increased accuracy,
- Promotes the visualization of landscape patterns,
- Increases accuracy in placement of soil lines and transects,
- Takes advantage of the latest technology to reduce the amount/cost of time spent in the field, and
- Maps areas that are inaccessible to soil scientists.

Key Points

- Increased Efficiency
  - Using LiDAR to create a soil map saves time (maybe 20 percent).
  - Map compilation is completely unnecessary.
- Increased Accuracy
  - Soil Scientists use more accurate data to determine placement of soil lines and transects, and the process is much less subjective than interpreting stereo photo pairs.
  - Digitized placement of the soil lines is determined by the original author of the soil map, thereby avoiding the problems of line-shift and symbol errors during map compilation.
- Increased Knowledge
  - LiDAR provides a base from which to more easily share ideas, landform traits, and mapping concepts.
- Increased Accountability
  - LiDAR promotes the use of onscreen digitizing. When the data is in a geodatabase stored on a central server, the progress and quality of the soil maps are easily checked by the project leader and quality assurance personnel.
- Increased Technology Training
  - The process fosters on-the-job training in new technology for all project members.
  - The process integrates well with other technology-driven tools; for example, ArcGIS, GPS Garmin, and TEUI.



The highly accurate slope data derived from LiDAR assists in the visualization of slope breaks on the landform.

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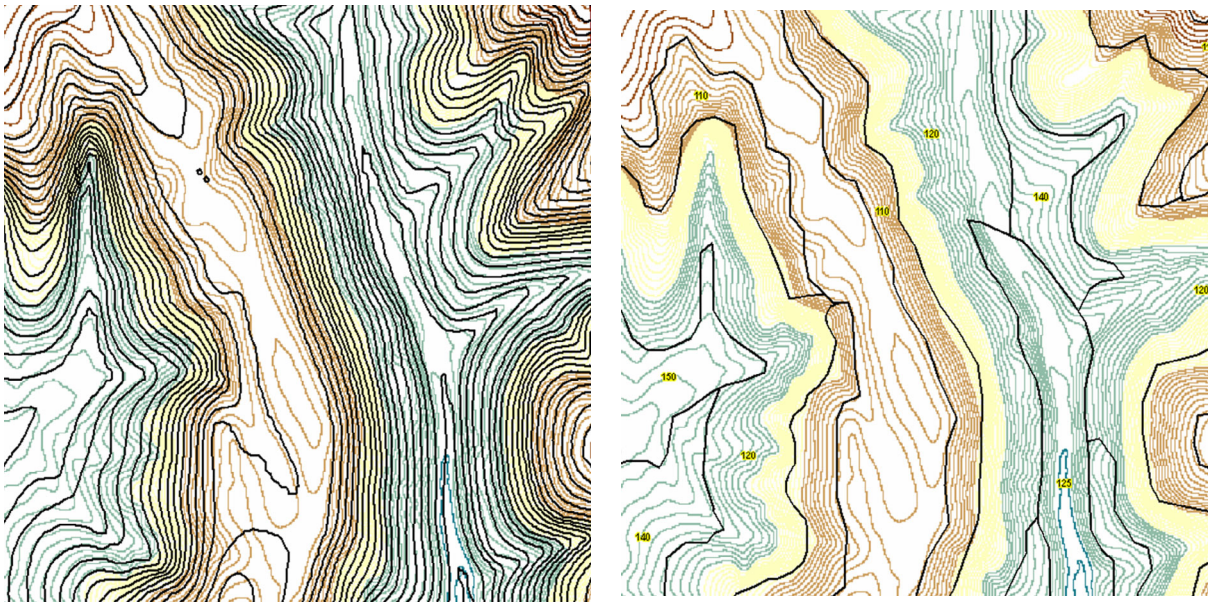

The image on the left shows 10-foot contours derived from a 10-meter DEM. The image on the right shows 5-foot contours (with soil lines) derived from LiDAR. The highly detailed contour lines from the LiDAR delineate elevation and position of landforms on the landscape.

LiDAR, continued from page 3

Summary of Overall Benefits for the Soil Scientist

- Large amounts of information are readily available for use.
- Numerous GIS layers are available.
- GPS tracking is used, which improves situational awareness.
- Soil lines are easy to edit.
- Documentation is improved for observation locations supporting map unit composition.
- The opportunity for compilation errors is reduced.
- Fewer steps are required by the field soil scientist to produce the finished product.
- The process promotes a better understanding of soil-landscape relationships.
- Data collection and observation location are integrated with GPS accuracy.■

Editor's Note

Issues of this newsletter are available on the Internet on the MO–15 homepage (http://www.mo15.nrcs.usda.gov/). Click on "News" and then on "The Coastal Plainer."

You are invited to submit stories for future issues to Aaron Achen, editor, MO–15, Auburn, Alabama. E-mail—Aaron.Achen@al.usda.gov.

Soil Characterization Sampling of a Proposed New Series in Washington County, Alabama

By Greg Brannon, Soil Data Quality Specialist, and Sandy Page, Soil Scientist, NRCS

Washington County, Alabama, is a rural county that averages only 16.7 people per square mile. It has a land area of 1,081 square miles. The 2006 census shows a population of 17,651, which is a 2.5 percent reduction since the 2000 census.

Forestry and forest products, two large chemical-manufacturing plants, and two electric-power plants are the mainstays of the local economy. The county has a narrow economic base, and revenues and the corresponding tax base are relatively small. Development of industry and infrastructure has progressed slowly. The economy, however, is expected to change. Recently, Thyssen Krupp, a Germany-based steel manufacturing giant, has announced that it will construct a multi-billion dollar plant on the Mobile-Washington County line. An influx of tens of thousands of construction workers and thousands of future employees is expected. Developmental pressure and real estate values are projected to rise significantly.

Figure 1.—A profile of the proposed Tibbie series. It has a field classification of fine, mixed, subactive, thermic Arenic Plinthaquic Paleudults.

With the expected economic changes in mind, the personnel of the Washington County soil survey project decided to take a closer look at many of the "wet" flats that occur throughout much of the southern two-thirds of the county. Their objective is to quantify and qualify these areas, which in many cases will come under direct developmental pressures. Furthermore, they wish to raise public awareness by ensuring that information concerning the true nature of these wet flats is readily available and usable, with special emphasis on small landowners. Many of these areas are unique biological ecosystems. In addition, depending on the degree of wetness, these areas commonly fall under a variety of federal, state, and local jurisdictions.

As a part of their evaluation of the wet areas, the soil survey team identified and sampled a new soil series. The proposed series is named Tibbie and has a field classification of fine, mixed, subactive, thermic Arenic Plinthaquic Paleudults (fig. 1). It is dominated by hydrophytic plants. It is noted for supporting pitcher plants, which are carnivorous plants that trap insects for ingestion (fig. 2).

Because pitcher plants and other hydrophytic herbs are so well represented on these sites, the question arose

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Tibbie, continued from page 5

Figure 2.—Pitcher plants in an area of the proposed Tibbie series.

concerning the classification of the soils as wetlands. Permits from the U.S. Army Corp of Engineers (USACE) are required for development on soils that are classified as wetlands. Wetlands are defined by the USACE as those areas that are inundated or saturated by surface or ground water at a frequency or duration sufficient to support (and that under normal circumstances do support) a prevalence of vegetation typically adapted to saturated conditions. Three criteria place a wetland under USACE jurisdiction: hydrophytic vegetation, hydric soils, and wetland hydrology. The question of hydric soils criteria is important in Washington County.

Preliminary investigations showed that a significant portion of the wet areas do not meet the criteria for hydric soils as established by *Field Indicators of Hydric Soils in the United States* (Version 6.0; Edited by G.W. Hurt, soil scientist, NRCS, National Soil Survey Center, Gainesville, Florida, and L.M. Vasilas, soil scientist, NRCS, Baltimore, Maryland). Questions and some controversy have arisen, however, regarding the status of the soils because of the dominance of grayish colors in the upper part of the soil. Such colors typically indicate significant periods of saturation under anaerobic conditions near or on the surface. Preliminary data suggest that at the series level some poorly drained soils, such as the proposed Tibbie series, contain both hydric and non-hydric soil components within a single map unit. These findings may have serious consequences.

Because of the questions, a field tour to view the areas and discuss the potential ramifications of soil classification was held for stakeholders and experts from several disciplines. Included in the tour group were soil scientists and a district conservationist from the NRCS, personnel from the Alabama State Health Department, supervisors from Washington County, biologists from the U.S. Fish and Wildlife Service, landowners, and a consultant. Also in attendance was Wade Hurt, retired head of the National Technical Committee for Hydric Soils. The tour group visited several sites, including the type location for the proposed Tibbie series.

When the pit was originally dug (by a backhoe) and described for characterization, no water table was encountered within a depth of 5 feet (fig. 3). Several small zones of saturation, however, were encountered near the

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Tibbie, continued from page 6

contact between the sand and underlying clay. Shortly after the characterization sampling, Dr. Joey Shaw and Dr. Wes Wood, both soil professors at Auburn University, also visited the pit. They confirmed the classification suggested by the soil survey team and offered opinions and remarks concerning pedology, mineralogy, and relationships between hydrophytic vegetation and poor pine productivity.

By the time the field tour was conducted, overland and subsurface flow from a significant rainstorm had filled the pit to within about 5 inches of the surface. At three different sites throughout the tour, shallow pits were excavated to examine hydric soil indicators. The preliminary findings of the soil survey team were vindicated. Within each map unit visited, both hydric and non-hydric components were observed. The only exception was at the first stop, where the associated Atmore series (coarse-loamy, siliceous, semiactive, thermic Plinthic Paleaquults) was unquestionably hydric, meeting all the jurisdictional wetland criteria.

Figure 3.—The soil survey team for Washington County, Alabama, sampling and describing the proposed Tibbie series. Angela Warden and Joey Koptis are in the pit; Sandy Page, project leader, is taking notes.

Some of the issues were not fully resolved. The consensus of the tour participants was to gather further data, including transects and soil descriptions, and then revisit the subject. As mentioned earlier, there is no question that these areas are unique ecological habitats. Such designation, however, will not forestall increased developmental pressures on these potentially wetland sites. ■

Selected Taxonomic Unit Descriptions

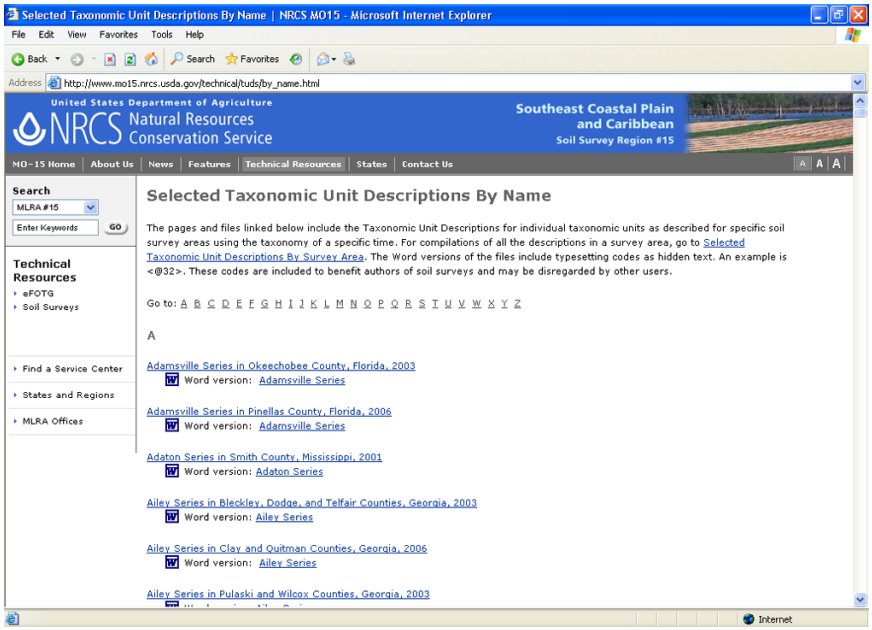
By Aaron Achen, Editor, MO–15

On October 15th, MO–15 added 866 edited, technically reviewed taxonomic unit descriptions (TUDs) to our Website at http://www.mo15.nrcs.usda.gov/technical/tuds/tuds-intro.html. The TUDs are from 28 survey areas in 5 states over the period 2000-2007. Most of the TUDs were copied directly from recently published surveys; the rest were copied from unpublished surveys for which the text is complete but the maps are pending.

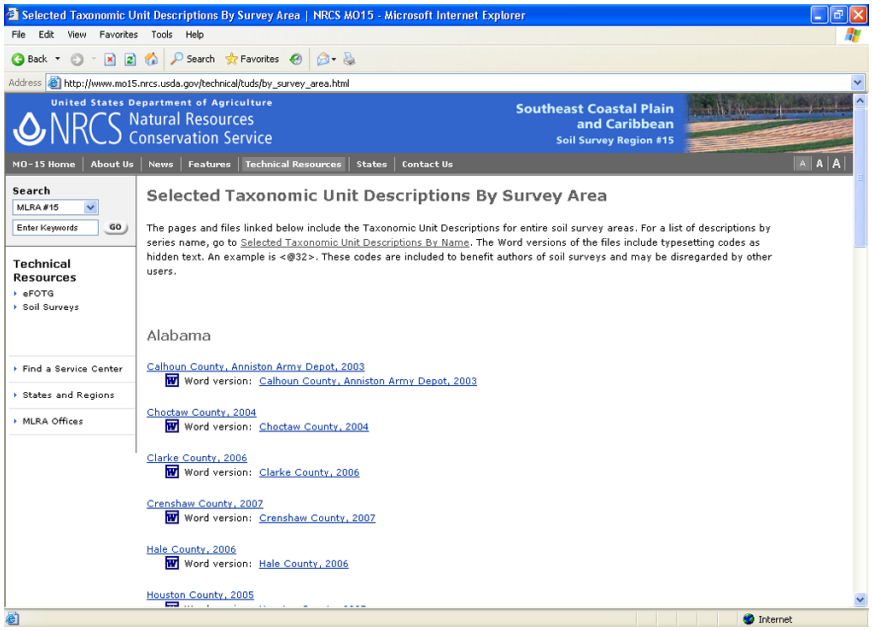
The TUDs are indexed by series name and survey area. They are available in two formats: Web pages for quick viewing and Word documents for usability. The Word documents are formatted in a manner similar to the official publications and include, as hidden text, the typesetting codes used by the Soil Survey Division.

The TUDs are intended to be the start of an expanding library of descriptions. Although they are being made available primarily for the benefit of authors of soil surveys, they may be of interest to anyone with a technical knowledge of soils. Multiple versions of the same series allow for direct comparison across survey areas over time. In the most extreme example, the Website has 17 descriptions of the Bibb series from 4 states over 7 years.

The descriptions illustrate the changes in description styles over the last 7 years. They should be a valuable supplement to the official series description. In particular, they should be an excellent tool for supporting the MLRA concept and should aid in the understanding of how series concepts change over time and due to local conditions. ■



Selected taxonomic unit descriptions indexed by series name.



Selected taxonomic unit descriptions indexed by survey area.

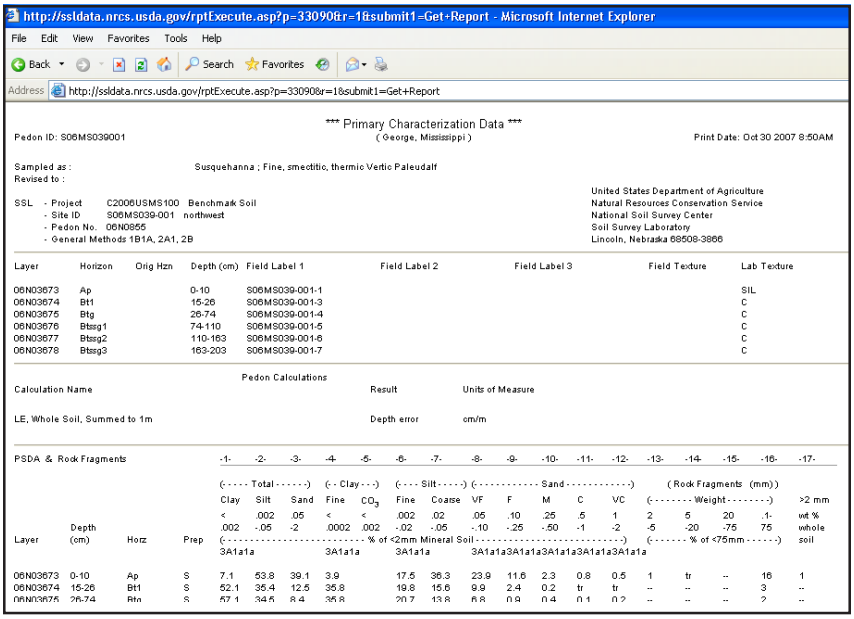
Benchmark Soils Update

By Gregory R. Brannon, Soil Data Quality Specialist

Even though the initial soil survey mapping is taking precedence in the MO–15 area, we are still updating and sampling benchmarks soils. Alabama has sampled Dothan soils (Plinthic Kandiudults) and Poarch soils (Plinthic Paleudults), and Mississippi has sampled Mantachie soils (Fluventic Endoaquepts) and Susquehanna soils (Vertic Paleudalfs). The samples are being analyzed at the National Soil Survey Laboratory in Lincoln, Nebraska, in order to establish and maintain continuity. Florida is making preparations to sample Leon soils (Aeric Alaquods) and Lakeland soils (Typic Quartzipsamments) in October of this year.

We plan to continue this endeavor as time permits, as initial mapping winds down, and as MLRA project offices are estab-lished in the MO–15 area.

Characterization data that is stored and maintained by the NSSC Soil Survey Laboratory is available online at http://ssldata.nrcs.usda.gov/. First-time users are encouraged to printout, read, and retain the online "Data Usage Statement" and "Disclaimer Statement" sections before accessing the database. ■



http://ssldata.nrcs.usda.gov/rptExecute.asp?p=33090&r=1&submit1=Get+Report - Microsoft Internet Explorer

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Address http://ssldata.nrcs.usda.gov/rptExecute.asp?p=33090&r=1&submit1=Get+Report

*** Primary Characterization Data ***

Pedon ID: S06MS039001 (George, Mississippi) Print Date: Oct 30 2007 8:50AM

Sampled as : Susquehanna ; Fine, smectitic, thermic Vertic Paleudalf
Revised to :

SSL - Project C2006USMS100 Benchmark Soil
- Site ID S06MS039-001 northwest
- Pedon No. 06N0855
- General Methods 1B1A, 2A1, 2B

United States Department of Agriculture
Natural Resources Conservation Service
National Soil Survey Center
Soil Survey Laboratory
Lincoln, Nebraska 68508-3866

Layer	Horizon	Orig Hzn	Depth (cm)	Field Label 1	Field Label 2	Field Label 3	Field Texture	Lab Texture
06N03673	Ap		0-10	S06MS039-001-1				SIL
06N03674	Bt1		15-26	S06MS039-001-3				C
06N03675	Btg		26-74	S06MS039-001-4				C
06N03676	Btsg1		74-110	S06MS039-001-5				C
06N03677	Btsg2		110-163	S06MS039-001-6				C
06N03678	Btsg3		163-203	S06MS039-001-7				C

Pedon Calculations

Calculation Name	Result	Units of Measure
LE, Whole Soil, Summed to 1m	Depth error	cm/m

PSDA & Rock Fragments

				-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	-9-	-10-	-11-	-12-	-13-	-14-	-15-	-16-	-17-
				(- - - - - Total - - - - - -)			(- - Clay - - -)		(- - - - Silt - - - - -)		(- - - - - - - - - - - - Sand - - - - - - - - - - - -)					(Rock Fragments (mm))				
				Clay	Silt	Sand	Fine	CO_3	Fine	Coarse	VF	F	M	C	VC	(- - - - - - - Weight - - - - - - -)				>2 mm
				< .002	.002 -.05	.05 -2	< .0002	< .002	.002 -.02	.02 -.05	.05 -.10	.10 -.25	.25 -.50	.5 -1	1 -2	2 -5	5 -20	20 -75	.1- 75	wt % whole
Layer	Depth (cm)	Horz	Prep	(- % of <2mm Mineral Soil -)												(- - - - - - % of <75mm - - - - - -)				soil
				3A1a1a			3A1a1a		3A1a1a		3A1a1a3A1a1a3A1a1a3A1a1a3A1a1a									
06N03673	0-10	Ap	S	7.1	53.8	39.1	3.9		17.5	36.3	23.9	11.6	2.3	0.8	0.5	1	tr	--	16	1
06N03674	15-26	Bt1	S	52.1	35.4	12.5	35.8		19.8	15.6	9.9	2.4	0.2	tr	tr	--	--	--	3	--
06N03675	26-74	Btg	S	57.1	34.5	8.4	35.8		20.7	13.8	6.8	0.9	0.4	0.1	0.2	--	--	--	2	--

Characterization data that is stored and maintained by the NSSC Soil Survey Laboratory is available online at http://ssldata.nrcs.usda.gov/.

Activities by MO Personnel

Soil data quality specialists and support team members on the MLRA Region 15 staff have contributed greatly to the overall team efforts in the region during fiscal year 2007. They have been tremendously involved in the following business activities to meet the needs of internal and external customers and partners in terms of soil survey information and products.

Activity	Number of Business Items
Progress Reviews	5
Technical Assists	4
Final Field Reviews	2
Final Correlation Conferences	2
Technical Edits	3
English Edits	22
Historical Replicas	20
Coastal Plainer Newsletters	2
NASIS Quality Reviews	10
Map Compilation Reviews (including digital)	19
DMF Reviews	5
Training Sessions	8
Sampling/Special Study Activities	3
Initial Progress Reviews	3
Technical Papers Published	2
Geospatial Data File Sets Developed for MLRA SSAOs	3
Travel Vouchers Processed for Detailed Soil Scientists	80