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The Coastal Plainer

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Message from the SSRO–Leader's Desk

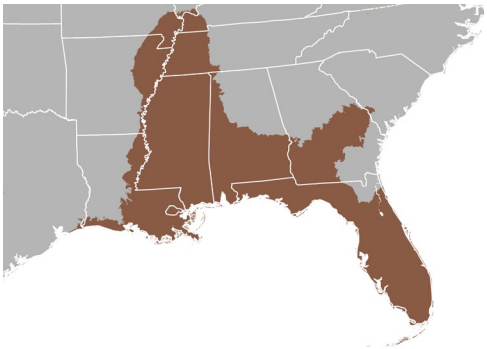
By Charles Love, Regional Director

Again, greetings everyone!

Looking back over fiscal year 2013, I was very impressed with our MLRA soil survey offices. They demonstrated strong communication and collaboration across the region to meet our key priorities, which included completing 100 percent of our goals for the soil data join recorrelation (SDJR), ecological site inventory (ESI), updates, and initial mapping across the region. I am so proud of our management and technical teams, MLRA soil survey office leaders and staff members, and the Region 7 team for their hard work in meeting these key Soil Science Division priorities. Outstanding job everyone!

Dave Smith, Soil Science Division (SSD) Director, recently announced that the regional directors are becoming a part of the SSD leadership team. The regional directors have begun assisting in the overall planning processes to support the Soil Science Division in meeting agency missions. During the week of September 9th, the SSD leadership met in Lincoln, Nebraska, to carry out key planning activities. Topics included operations, administration, technical support, technology implementation, and long-range planning. I hope to provide an overview of the available information at teleconferences among the MLRA soil survey office leaders and the management team and at the various State cooperative soil survey conferences. The regional directors are excited to become a part of the SSD leadership team.

Soil Survey
Region #7



Dave Smith recently shared a key date for personnel actions necessary for implementing the realignment of the Soil Science Division. Prior to November 3, the 12 regional offices will no longer be supervised by the States and the soil survey offices will be supervised by the Regional Offices

The 12 regional directors are working very closely with Associate Director for Soil Operations Roy Vick in carrying out key

In This Issue:

Message from the SSRO–Leader's Desk..... 1
Ecological Site Inventory and Soil Correlation in ONF..... 3
2013 Florida Hydric Soil Workshop..... 8
Technical Soil Services in Alabama..... 9
The National Hydric Soil Committee Looks at Anomalous Bog Soils.....10
SBAAG Ad Hoc Committee on Soil Survey Office Computer Configurations 15
New State Soil Scientist for Alabama 15
New MLRA Soil Survey Leader at Ft. Myers ...16
Nondiscrimination Statement.....16

administrative, operational, and reimbursement tasks to support the realignment efforts.

Another push we are excited about is visiting the MLRA soil survey offices (MLRA SSOs) in the region. The Region 7 senior regional soil scientist, soil data quality specialists, and I have visited almost every MLRA SSO in the region; we only have the MLRA SSO at Quincy, Florida, left to visit. We hope to visit Quincy in first or second quarter of FY–14. The visits have provided great opportunities for staff of Soil Survey Regional Office 7 (SSRO–7) to have detailed discussions with the MLRA SSO leaders and staff. During our visits, we provided technical assistant; observed office space, vehicle fleet management, and real and personal property; discussed the SSD realignment and other management items; and provided training regarding the SDJR effort. I truly believe these office visits were equally beneficial to us and the MLRA SSO staffs.

The Region 7 ESI team has been working hard to develop key ecological site descriptions in MLRAs 134, 151, and 154. The team is conducting technical meetings and field reviews, which involve State and local cooperators and NRCS employees at the state and regional levels. The team frequently hosts teleconferences to improve the continuity of the ecological site inventory across the region. As one of our ESI specialists recently stated, “These conferences have provided a conduit to assist in fleshing out additional ESDs.”

We just heard that Region 7 was selected to host one of four regional modeling units. The modeling units will be on the SSRO staffs at Davis, CA; Temple, TX; Auburn, AL; and Amherst, MA. The units will be under the supervision of the regional director. Each unit will have about 3 staff members. The National Modeling Unit Leader will provide technical leadership in meeting the agency mission. The modeling units will perform key tasks and have key responsibilities for both national and regional projects. The units will provide support for conservation landscape initiatives, CEAP, RUSLE2, and other activities. Region 7 is very glad to have this opportunity.

The Region 7 management team has reviewed and approved the following timeline for key SDJR tasks in FY–14.

- July–September, 2013: Evaluation of assigned SDJR projects by MLRA SSOs in consultation with technical teams and the management team.
- August–September, 2013: Entry of evaluated and approved SDJR projects into NASIS.
- August–September, 2013: Senior regional soil scientist conducts QA reviews before final project approvals. Management team approves SDJR projects. SDJR projects are distributed to appropriate States.
- September 30th: Deadline for plan approval. No plans will be added or removed after this date without special approval from the regional director.
- October 1st, 2013, through July 31st, 2014: Data population for each assigned SDJR project by MLRA SSOs, quality control and assurance reviews, and progress reporting.
- October 1st, 2013, through July 31st, 2014: SDJR projects are submitted to SSRO–7 as they are completed.
- January 1st, April 1st, July 1st: 25 percent of each SDJR project reported in NASIS.
- July 31st, 2014: Final day to submit SDJR projects to SSRO–7 for FY–2014.
- July 31st, 2014, through September 30th, 2014: SSRO staff finishes up the quality assurance reviews and correlation activities. SDJR projects for FY–15 are developed.

Keeping these key tasks to the timeline will ensure that the Region 7 team can complete the quality control and assurance reviews, approval process, and correlation activities for the assigned projects in a timely manner.

Projected FY–14 Goals for Region 7
326 SDJR projects
2 ESI projects
1 Update project
1 Initial mapping project

In closing, I'd like to say FY–13 gave us some exciting challenges, and there were great accomplishments from all the teams in Region 7. Again, thank you for an outstanding job!

As we move into FY–14, I am confident we will continue to meet the Soil Science Division priorities to fulfill our agency missions.

As always, thank you for your support. ■

—*Charles*

Ecological Site Inventory and Soil Correlation in Ocala National Forest and throughout MLRA 154

By Rick Robbins (Soil Scientist, Gainesville), Susan Carr (ESI Specialist, Tavares), and Timothy Daubert (MLRA–SSL, Tavares)

Background

The Ocala National Forest (ONF) contains about 300,000 acres in north-central Florida and includes the largest tract of Sand Pine Scrub habitat in the world. The excessively drained Entisols of ONF support ecologically significant Longleaf Pine Sandhill plant communities. Several threatened and endangered plant and animal species inhabit these native plant communities, including the Florida scrub jay, red-cockaded woodpecker, and Lewton's milkwort.

In 2011, the USDA–NRCS and USDA–Forest Service entered into an agreement to update the soil survey of Ocala National Forest (ONF). The original ONF fieldwork, conducted from 1963–1968, no longer met the Forest Service's requirements for soil attribute data and interpretations. Prior to the agreement, a comprehensive map unit evaluation was completed for the entire survey area. The evaluation determined the priority and workload requirements for each map unit. A work plan for calendar years 2011–2013 was developed to target xeric upland map units associated with Astatula soils that support both the Sand Pine Scrub and Longleaf Pine Sandhill plant communities in the Ocala National Forest.

The original ONF soil survey mapped several "phases" of Astatula sand map units. These soils are very deep Entisols that do not have profile development. Two types of xeric upland vegetation are coincident with the original ONF Astatula map units: Sand Pine Scrub and Longleaf Pine Sandhill. The Sand Pine Scrub community occurs on the typical Astatula map unit, and a dark-surfaced phase of Astatula supports the Longleaf Pine Sandhills community.

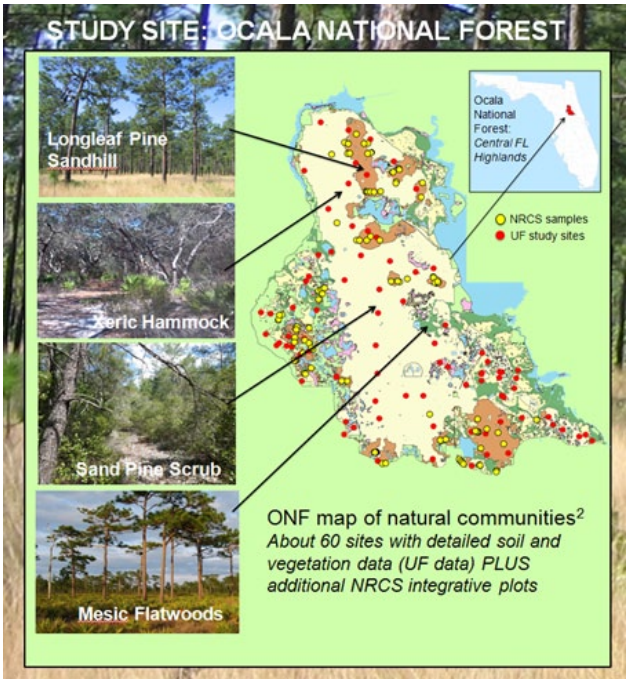


Figure 1.—Location of Ocala National Forest and ONF study site locations. Yellow shading indicates distribution of Sand Pine Scrub; brown denotes Longleaf Pine Sandhill.

Our objective was to couple an ecological site inventory (ESI) of xeric uplands of excessively drained Entisols with the ONF update project. As part of the update, we wanted to examine if and how edaphic (soil) properties influence distribution of the two xeric plant communities. To this end, we (1) developed a model of soil-ecological site correlations, (2) gathered site-specific data related to soil properties and their influence on the natural vegetation, and (3) involved both soil scientists and plant specialists in the ESI fieldwork process.

Fieldwork (Methodology and Data Collection)

Our first step was acquisition of data. Fortunately, a lot of "existing data" were available, including spatial map data and data related to site-specific soils and vegetation samples. One such dataset came from a mid-1990s cooperative project bewteen the U.S. Forest Service and University of Florida. It included site-specific vegetation and soil property data across a range of soils and natural plant community conditions in the ONF.

We augmented the existing site-specific data with our own field sampling. Specific field protocols involved placement of continuous linear transects through the scrub and sandhill communities. Point data were collected for each respective soil component and vegetative composition. Various geomorphic landform positions were sampled to evaluate differences in soils and vegetation based on landscape position.

Finally, we investigated subsoil properties of the Astatula map units (including the dark-surfaced phase) using ground-penetrating radar (GPR), pedon descriptions, and natural community inventories. These tools were used to document soil properties and the corresponding plant species of the scrub and sandhill communities. The project team for the 2012–2013 field seasons consisted of four soil scientists (Alison Steglich, Julie Ruh, Timothy Daubert, and Rick Robbins), an ecological site inventory specialist (Susan Carr), and a student intern (Tori Bahe).

Soil Property Results and Findings

We developed quantitative models relating natural plant community distributions to soil properties (to a depth of 2 meters) using site-specific existing data coupled with our field samples. We were able to model vegetation distribution to actual soil properties rather than to soil map units. Not surprisingly, depth to water table was the main soil property that separated xeric uplands from the lower lying flatwoods vegetation. However, the only measured soil properties that distinguished Sand Pine Scrub from Longleaf Pine Sandhills on Astatula sands were pH, phosphorous, and the thickness, color, and organic matter content of the A horizon. For the most part, these are dynamic soil properties. As such, they may be directly influenced by land management and existing vegetation (e.g., via nutrient inputs and organic decomposition). Further investigations of the correlations between dynamic properties and frequency of prescribed fire underscored the influence of fire management on the soil properties (fig. 2).

The GPR transects revealed minimal differences in subsoil properties among Astatula map units. Composition of the GPR transects was 79 percent Astatula series, 15 percent Candler series, and 6 percent Apopka series. The primary anomalies were depth to lamellae and depth to the loamy Cypresshead formation. Figure 3 shows a 200-meter sample of the GPR readings and illustrates the lamellae and Cypresshead signatures of the Candler component (depth in meters).

These observations lead us to conclude that the distribution of Sand Pine Scrub compared to Longleaf Pine Sandhills on Astatula sands is not edaphically driven in the ONF. Instead, the distribution is a function of fire regimes and biogeography. Therefore, we included these two very different xeric plant communities in a single ecological site concept that encompasses large map units in central Florida.

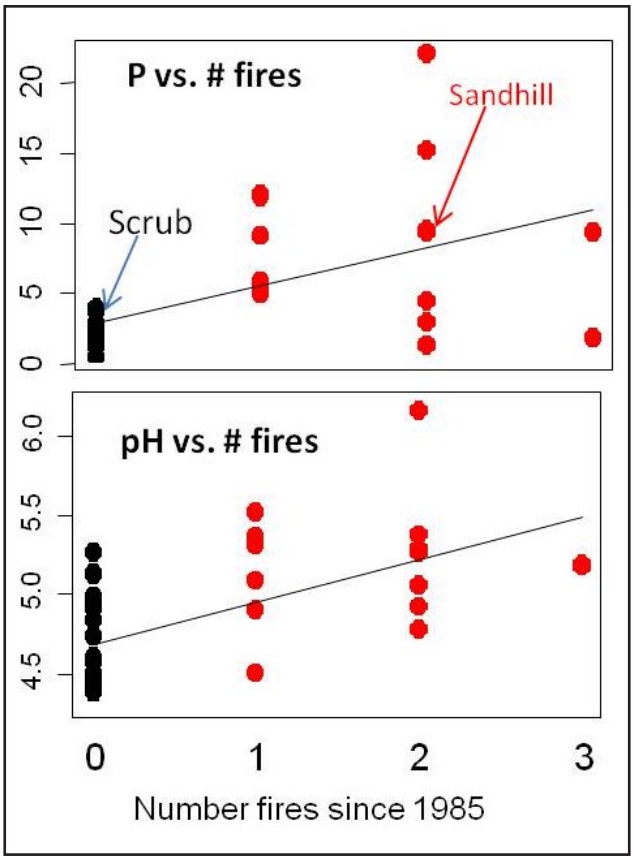


Figure 2.—Correlation of phosphorous (P) and pH to frequency of fire at pedon sample sites in ONF.

The ecological site is named "Astatula-Candler xeric sandhill-scrubs."

Our next step involved expanding the xeric sands ecological site concept to other regions and similar map units in MLRA 154 (fig. 4).

One of the primary obstacles to our validation of the soils to natural communities involved the legacy mapping of Astatula and Candler series. Historically, the mapping model centered on the Astatula series supporting both the sandhill and scrub communities and the Candler series supporting primarily the sandhill community. In the course of our field investigations, however, we observed similar plant communities, community dynamics, and soil properties on similar map units throughout the MLRA. These observations allowed us to apply the ecological site concept to both Astatula and Candler map units. Altogether, these map units encompass approximately 1.3 million acres of central Florida (fig. 4).

Moving Forward: Development of Statewide Ecological Site–Soils Database

The next step for the Florida ESI program is to develop a database of natural communities and soil attributes. This database is being developed to incorporate existing data from disparate sources. It will be used to model edaphic drivers of plant community distribution and succession (e.g. depth to seasonal high water table, available water capacity, or a combination of attributes). Existing soils data are being linked to mapped natural vegetation throughout the State. To this end, we collected existing datasets from many

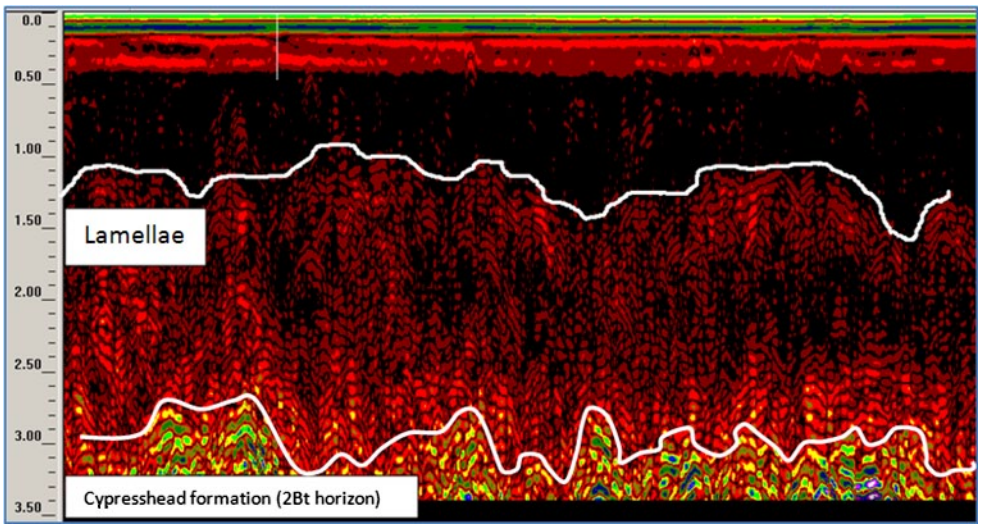


Figure 3.—GPR signatures of Candler soils (white line delineates differences in sand, lamellae, and loamy 2Bt horizons.)

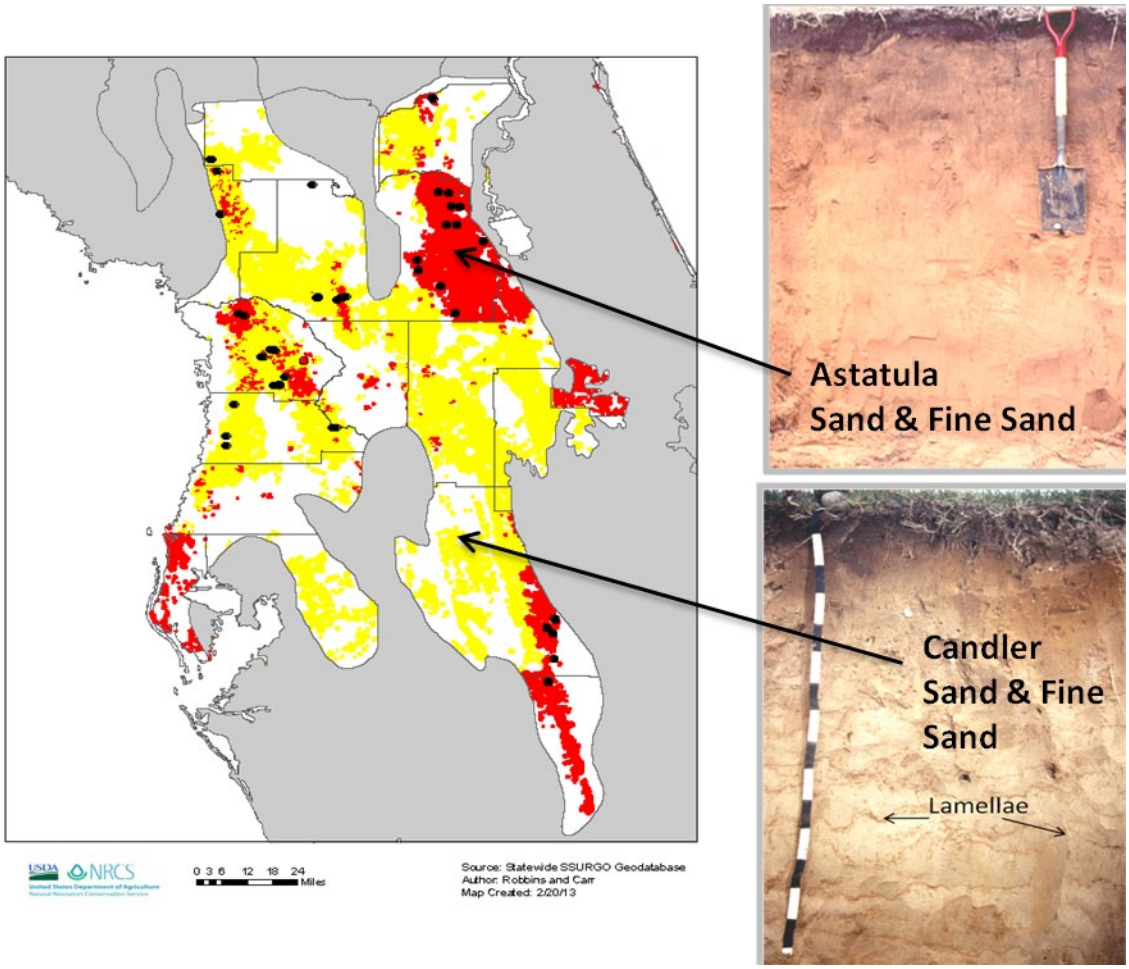


Figure 4.—Sample sites (black dots) for ecological site inventory and soil survey on public lands throughout MLRA 154.

sources, including NASIS; the Florida Natural Areas Inventory (FNAI), Natural Communities; and the University of Florida soils lab data. The following descriptions summarize the types of data included in our ESI database.

FNAI natural community data and acreage.— The database includes mapped distributions of 37 natural community types on specific managed areas throughout the State using the FNAI Natural Community Description convention. Natural communities ranging from Xeric Hammock to Salt Water Marsh were digitally mapped, mainly on public lands, using remote and field validation. We also have some associated point data for natural community attributes.

Specific physiognomic metrics derived from NASIS.—The database includes map unit kind, component name, component kind, phase (if applicable), percent of map unit, component kind, slope (low, representative, and high), drainage class, hydric status, seasonal high water table (upper representative value), flooding frequency, flooding duration, ponding frequency, ponding duration, restriction kind, and restriction depth.

Specific NASIS and IFAS soil lab data.—The database includes texture, horizon designation, horizon depth (top/bottom), fragment volume, total sand, very coarse sand, coarse sand, medium sand, fine sand, very fine sand, total silt, total clay, organic matter (low, representative,

and high), available water capacity, saturated hydraulic conductivity, pH (by $CaCl_2$ method), pH (by water method), calcium carbonate equivalent, CEC–7, ECEC, electrical conductivity, and sodium adsorption ratio.

Using this ESI database, we can design specific queries to determine attribute ranges for selected natural communities and correlate the extent (in acres) of the natural community to an individual map unit. Figure 5 shows an example of the soil properties (by weighted average to a depth of 200 centimeters) in Access using a query regarding the Alaquods great group.

The final product of this attribute database will be statewide soil-ecological site groupings by community phase, identification of edaphic drivers for specific communities, and the use of the data in statistical modeling for specific communities. ■

NC_Soils_Taxclass Query

MUNAME	TAXGG	WA20	WA200_CLAY	WA200_OM	WA200_AWC	WA200_pHW	WA200_CEC7
Boulogne fine sand	Alaquods	3.17	6.07	2.96	0.16	5.58	0.00
Chaires-Chaires, depressional complex	Alaquods	5.50	11.70	0.61	0.10	4.85	5.01
Chaires fine sand	Alaquods	5.59	13.21	1.02	0.11	5.15	4.41
EauGallie fine sand, depressional	Alaquods	6.28	9.67	1.24	0.11	5.92	4.02
EauGallie fine sand	Alaquods	3.45	6.72	1.25	0.09	5.81	3.14
EauGallie sand	Alaquods	2.88	6.39	1.11	0.09	6.05	3.56
Estero muck	Alaquods	1.23	2.76	4.64	0.12	5.57	7.86
Farmton fine sand	Alaquods	2.25	8.49	1.25	0.12	4.67	0.00
Immokalee sand	Alaquods	1.50	2.72	1.63	0.08	4.86	0.03
Immokalee fine sand	Alaquods	1.61	3.03	1.36	0.08	4.85	0.14
Leon-Chipley complex	Alaquods	3.15	2.91	1.16	0.10	5.18	0.00
Leon sand	Alaquods	3.10	2.66	1.28	0.09	5.00	0.19
Leon fine sand, tidal	Alaquods	0.75	4.29	2.00	0.14	5.84	1.68
Leon fine sand, freq/occas flooded	Alaquods	2.40	2.47	0.94	0.09	4.81	0.00
Leon fine sand	Alaquods	2.10	3.11	1.56	0.12	4.96	0.00
Lynn Haven sand	Alaquods	2.94	2.86	1.30	0.09	4.69	0.00
Lynn Haven fine sand	Alaquods	2.50	4.18	2.05	0.16	4.74	0.00
Lynne sand	Alaquods	5.84	23.01	0.68	0.12	4.67	0.22
Mascotte and Plummer soils, occassionally	Alaquods	7.21	11.66	1.04	0.13	4.81	0.00
Mascotte sand	Alaquods	6.28	15.46	0.80	0.11	4.79	0.00
Mascotte fine sand	Alaquods	5.22	9.09	0.97	0.10	4.75	0.00

NC_Soils_Taxclass Query

MUNAME	TAXGG	Dry Prairie	Hydric Hammock	Mesic Flatwoods	Mesic Hammock	Scrubby Flatwoods
Boulogne fine sand	Alaquods	0	8	966.1	0	0
Chaires-Chaires, depressional complex	Alaquods	0	0	0	0	0
Chaires fine sand	Alaquods	0	767.6	2348.1	813.4	0
EauGallie fine sand, depressional	Alaquods	0	451.7	84.6	30.9	0
EauGallie fine sand	Alaquods	7560.8	450	14387.5	910.5	232.4
EauGallie sand	Alaquods	428.3	0	2511.4	16.3	6.2
Estero muck	Alaquods	0	0	17.4	0	0
Farmton fine sand	Alaquods	4522.3	26.9	3079.3	0	129.5
Immokalee sand	Alaquods	9710.9	504.5	27118.3	610.4	3682.3
Immokalee fine sand	Alaquods	8236.3	495.5	33657.6	1931.4	2947.6
Leon-Chipley complex	Alaquods	0	0	0	0	0
Leon sand	Alaquods	0	74.2	3415.6	762.4	377.6
Leon fine sand, tidal	Alaquods	0	10.4	0	0	0
Leon fine sand, freq/occas flooded	Alaquods	0	0	100.7	0	0
Leon fine sand	Alaquods	0	255.4	3257.6	37	112.4
Lynn Haven sand	Alaquods	0	5.5	64.9	0	6.5
Lynn Haven fine sand	Alaquods	0	26	182.4	0	0
Lynne sand	Alaquods	0	81.1	218	34	33.8
Mascotte and Plummer soils, occassionally	Alaquods	0	0	93.4	0	0
Mascotte sand	Alaquods	0	0	734	0	0
Mascotte fine sand	Alaquods	0	20.6	191.1	0	5.5

Figure 5.—Results of a query illustrating soil map units linked to specific attributes and natural community extent in Alaquods. Note the community types are reported in acres for each soil map unit.

2013 Florida Hydric Soil Workshop

By Sherlynette Castro, Soil Scientist, Fort Myers, Florida, Soil Survey Office

This year, the Florida Association of Environmental Soil Scientists (FAESS) held their annual Hydric Soil Workshop in conjunction with the MLRA Soil Survey Office at Fort Myers, Florida (7–FOR). The meeting started Tuesday morning (April 16) with lectures on fundamentals in soil science, identification of regional hydric soils, landscape hydrology, and onsite sewage disposal case studies. The workshop also presented a field exercise at the Babcock-Webb Wildlife Management Area—Yucca Pens Unit. The field sites included hydric soil indicators, such as muck presence (A8) and stripped matrix (S6).

The meeting included discussions on the "Hydric Soils of Florida Handbook," the Florida hydric soil indicators yellow sheet, Florida Department of Health (DOH) onsite sewage programs, and NRCS CPA-Food Security Act wetland identification procedures. The continued work between FAESS and NRCS is extremely important for advancing knowledge of hydric soils and for discussing and resolving concerns, proposals, and recommendations for the cooperative soil survey. The workshop was attended by environmental consultants, DOH personnel, NRCS personnel, university students, researchers, and professors from around the State. ■

Sherlynette Castro, soil scientist at MLRA Soil Survey Office 7-FOR (Fort Myers, Florida), leading a discussion at a field site during the 2013 Hydric Soil Workshop of the Florida Association of Environmental Soil Scientists.

Technical Soil Services in Alabama

By Lawrence McGhee, Alabama State Soil Scientist

On December 11, 2012, Acting Alabama State Soil Scientist and Soil Survey Regional Director Charles Love hosted a meeting on technical soil services at the Alabama State office in Auburn. The meeting was attended by Charles, staff of Soil Survey Regional Office 7, and project leaders and other staff from the MLRA soil survey offices at Loxley (7-LOX), Auburn (7-AUB), and Normal (6-NOR). Also in attendance were Resource Soil Scientists Milton Tuck and James Mason and State GIS Specialist Joe Gardinski.

As then-assistant state soil scientist, I moderated the meeting. The objective of the meeting was to focus on and review the procedures for delivery of technical soil services in Alabama.

Charles expressed in his opening remarks the importance of reporting technical soil services in an accurate and timely manner. I presented a proposed system for delivery and reporting of technical soil services in Alabama for fiscal-year 2013. Extensive discussion was held regarding soil scientists from the MLRA project offices providing assistance with technical soil services. The soil scientists on MLRA staffs are authorized to use up to 15 percent of their operational time on activities supported by conservation operations 01 funding. Joe Gardinski presented a very helpful “how to” demonstration on using GIS tools to assist in delivery of technical soil services. Gardinski was very proactive in providing soil layers to assist State resource staff with planning and implementation of several national initiatives in Alabama, including those related to the gopher tortoise, longleaf pine, and atypical (problem) soils for WRP eligibility. The resource scientists welcomed the additional support in carrying out technical soil services activities across the State.

The group enjoyed a festive holiday lunch buffet at a local restaurant. Several awards and certificates were presented by the acting state soil scientist and MLRA project leaders. The meeting was concluded by closing comments and holiday greetings from Charles. ■

Soil Survey Regional Director Charles Love hosting a meeting on technical soil services in Alabama. The meeting was held at the State office in Auburn.

The National Hydric Soil Committee Looks at Anomalous Bog Soils

By Sandy Page, Soil Scientist, MLRA Soil Survey Office, Loxley, Alabama

The lower Gulf Coastal Plain of Alabama, Florida, Louisiana, and Mississippi contains many complex ecosystems. One such system is the pine savannah, which commonly includes communities referred to as "pitcher plant bogs" or "crawfish flats." Other synonyms include pine flatwoods, pitcher plant prairies, or grass-sedge bogs. Closely related are hillside seepage bogs, which commonly contain few pine trees but are closely associated with the pine-savannah systems. A markedly unifying feature of these bogs is the presence of multiple species of carnivorous plants, such as pitcher plants *(Sarracinia* spp.) and sundews *(Drocera* spp.). Under natural conditions, pine savannahs are characterized by sparse overstory canopies of longleaf pine *(Pinus palustris)* and/or slash pine *(Pinus elliotti)* underlain by an extraordinarily diverse community of forbs and grasses. In addition to the beauty of these areas, many species of orchids, lilies, and grasses (some rare and endangered) are found only in this ecological niche.

During field investigations for the soil survey of Washington County, Alabama, these pine savannah ecosystems emerged as being relatively small in individual size but widespread across certain parts of the landscape (fig. 1). A multitude of questions concerning these areas was generated by subsequent investigations (including a multi-agency field trip to Desoto National Forest in Mississippi on March 30, 2010) and by communications concerning similar observations by several soil scientists and personnel of other agencies and disciplines in Alabama and Mississippi. One question in particular was pervasive, "Why did some of the soil pedons in these bog areas lack a hydric soil field indicator when the hydrology and hydrophytic plant community suggested a jurisdictional wetland?" In fact, two soil series (Tibbie and Pinebarren) established in Washington County, Alabama, appear to meet the technical standards for hydrology and vegetation but lack a hydric soil indicator (fig. 2).

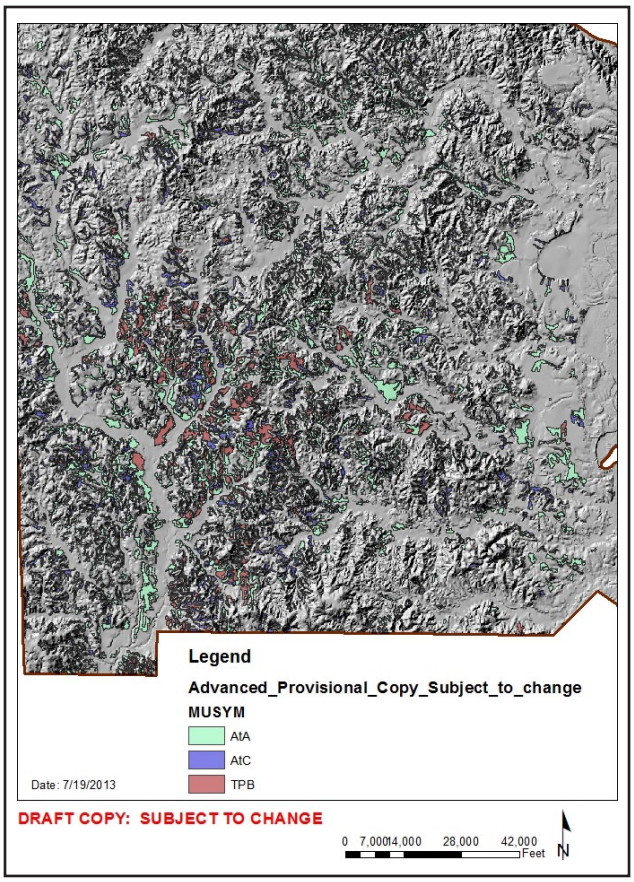


Figure 1.—Potential bog communities in southwestern Washington County, Alabama, projected on a hillshade relief map. Map units are: AtA—Atmore fine sandy loam, 0 to 2 percent slopes; AtC—Atmore fine sandy loam, 2 to 8 percent slopes; and TPB—Tibbie and Pinebarren soils, 1 to 5 percent slopes.

In April 2012, the National Technical Committee for Hydric Soils (NTCHS) visited the lower Gulf Coastal Plain of Alabama and Mississippi to consider the anomalous bog soils. The committee had two questions, "Does the absence of a hydric soil indicator imply that the hydrology is insufficient to produce anaerobic conditions long enough to meet the technical standard for a hydric soil; or, if not, is there a need for an additional indicator?"

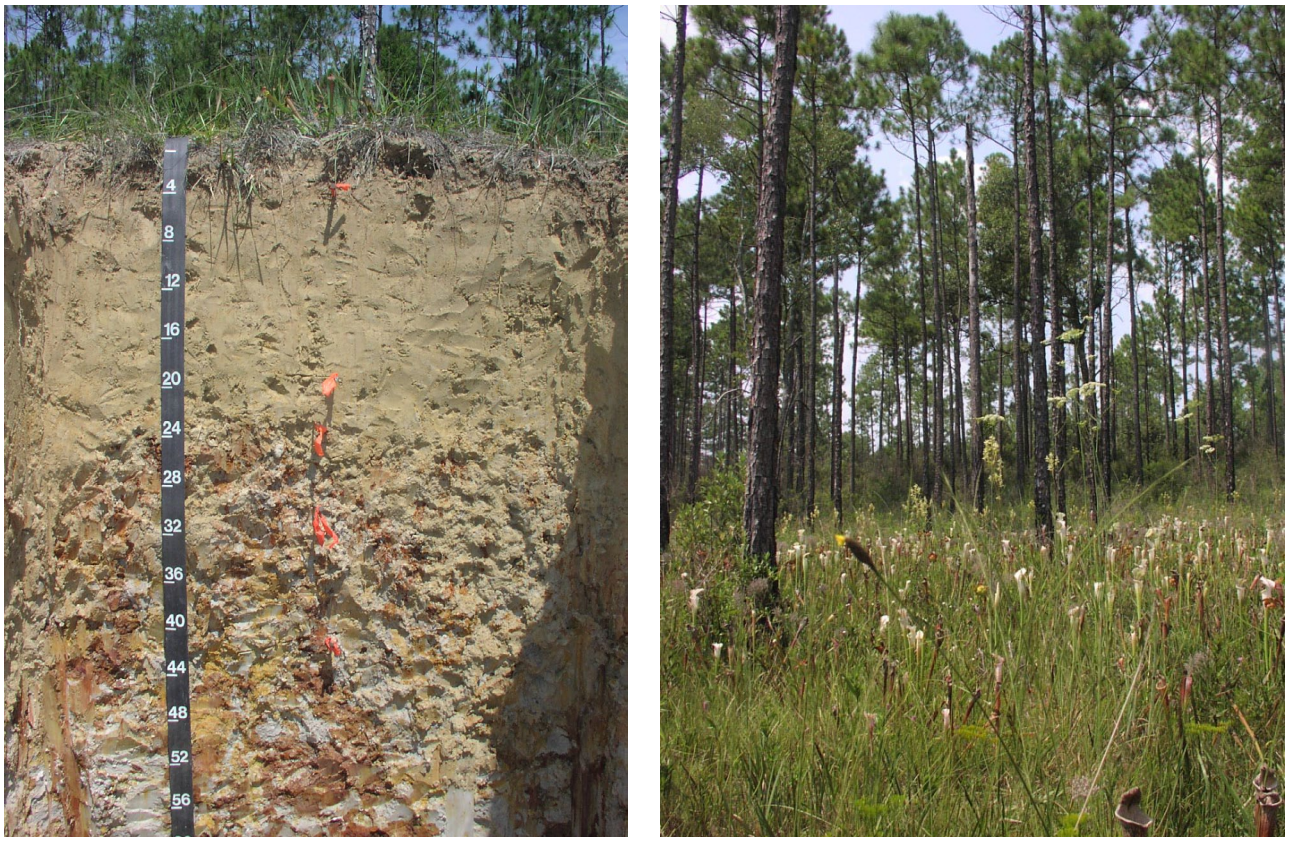


Figure 2.—Excavation of a Tibbie soil revealing a poorly drained soil that lacks a hydric soil indicator. The dominant matrix has chroma of 3, and low-chroma depletions are within a depth of 6 inches. The landscape photo shows the sparse overstory with hydrophytic pitcher plants in foreground.

In 2007, personnel for the Washington County soil survey took a close look at many bog areas in the southern two-thirds of the county. A field visit with the Alabama Department of Public Health in Washington County regarding an application for installation of a septic system acted as a catalyst for taking a closer look at these "problem soils." The objective was to quantify and qualify these areas in anticipation of future developmental pressures.

Based on years of observation and experience, a consensus developed between myself and other soil scientists with NRCS, the U.S. Fish and Wildlife Service, and the U.S. Army Corp of Engineers. We agreed that the bog ecosystem in Washington County, Alabama, had many similarities to areas in other parts of the State, including northern Baldwin, Escambia, and Mobile Counties and southern Monroe and Conecuh Counties and that analogous situations would be found in the Florida panhandle, southern Mississippi (within a three tier proximity to the Gulf), and southeastern Louisiana. Further west, for example, there are similar areas that are well described as ecological systems of the natural communities of Louisiana. There was also conjecture that—as in Washington County, Alabama—these bog systems would include areas that appeared poorly drained but lacked a hydric soil indicator.

Common site factors of these anomalous areas include wetness factors that are significantly influenced by subsurface lateral flow. The parent material commonly consists of coarse grained to loamy sediments underlain by a restrictive layer of finer sediments at some depth. The upper parts of the surface and subsurface are typically coarse. In many

cases, the underlying material is an erosional surface of an earlier depositional period. This underlying material is commonly impervious and contributes to higher water tables on flats and in areas of head slopes, footslopes, and toeslopes where downslope movement of surface and subsurface water converges.

The natural setting of coastal plain bogs is dominated by an ecosystem of longleaf pine savannah and mixed pines and hardwoods. Fire is a major part of this system. Historically, ecological niches and species composition were largely a result of the prevalence of wildfire. In the past 100 years, wildfires have been contained by fire suppression; in many cases, prescribed burning has been substituted. Uneven-aged, old-growth longleaf forests have been widely replaced by plantation-grown loblolly pine and slash pine. The natural ecological niches of bog communities are extremely sensitive to disturbance by soil manipulation, fire suppression, and alteration of the hydrology. In the absence of fire, pines and large shrubs eventually encroach on these areas. The result is two-fold. The species diversity and renewal of the forb layer is compromised, and a build-up of biomass and fuel may result in a less frequent but extremely hot, ecologically damaging wildfire or prescribed burning.

The confounding situation of large areas of soils that appear to be poorly drained but non-hydric was brought to the attention of the NTCHS. The committee decided to visit the Gulf Coast of Alabama and Mississippi in 2013 to assess conditions in the pitcher plant bogs. These anomalous areas were expected to occur over a wide range of the lower parts of the Southern Coastal Plain. Three sites were chosen for monitoring: Sandhill Crane Wildlife Refuge in Jackson County, Mississippi; a tract belonging to a private landowner in Washington County, Alabama; and Splinter Hill Bog, which is owned by the Nature Conservancy, in Baldwin County, Alabama.

In October 2012, in preparation for the committee visit in April 2013, Chris Noble (NTCHS member) and Jacob Berkowitz from the U.S. Army Corp of Engineers installed IRIS tubes and monitoring wells. They completed soil descriptions for pedons at each site, and some representative soil samples were sent to the Kellogg Soil Survey Laboratory. Subsequent visits checked the sites, monitoring equipment, and data loggers. Precipitation data was obtained for the 6 month period, and a Darem Analysis was run on the normalcy of precipitation events. Vegetation data was collected onsite the day of the field trip by several plant experts, including Al Schotz, Jim Teaford, Gena Todia, Jim Duffy, and Louise Duffy.

Participants for the field trip in April of 2013 consisted of several members of the NTCHS, the state soil scientist of Mississippi, the assistant state soil scientist of Alabama, local NRCS soil scientists, representatives from the U.S. Fish and Wildlife Service, representatives from the U.S. Army Corp of Engineers, and several local professional botanists, ecologists, and consultants.

The first site visited was Sandhill Crane Wildlife Refuge, which is directly west of the Pascagoula River delta in Jackson County, Mississippi. It is situated about 20 feet above sea level on a relatively younger (possibly Holocene/Quaternary) marine terrace. It is a low-lying, nearly level terrace drained by Gulf Coast flatwoods cypress/gum swamps. The governing factors of the hydrology are rainfall intensity over time, the nearly level topography, low relief, and, in places, tidal influence. These factors produce a small hydraulic gradient resulting in slow movement of water through the soil and governed by restricted flow due to flat topography.

In contrast, the Alabama sites are further inland, are at elevations somewhat above 200 feet, and are open drainage systems. They are on older, more dissected landscapes. Hydrologic periodicity is more complex because of a longer fall to sea level and the many tributaries of different stream orders contributing to subsurface and surface water movement. Hydrology is less governed by low relief

and tidal influence. The determining factors controlling water movement are stream order complexity, the impermeable substratum, and landscape position and topography. These sites are on nearly level flats or in gently sloping, concave flow-through and discharge areas on heads of drains, footslopes, and toeslopes.

Vegetation was dominantly hydrophytic on all three sites. The Sandhill Crane site had the least species diversity and had no overstory canopy. The Splinter Hill Bog site had the greatest diversity. The Washington County and Baldwin County sites had a sparse overstory canopy. Frequent prescribed burns are used as a management tool at all three sites. Frequent prescribed burns mimic natural conditions by suppressing woody vegetation and allowing forbs and grasses to flourish. Many species of plants that are found predominantly in wet, open pine savannahs were catalogued by participants. These species included pitcher plants, sundews, goldencrest, beak sedges, bog clubmoss, and orchids.

The field indicators for hydric soils, as defined by NTCHS, are morphological features that result from soil development under anaerobic (waterlogged) conditions. The indicators are used for onsite verification to identify hydric soils in the field. The indicators are used to identify the hydric soil component of wetlands, but they are not intended to replace the requirements of the hydric soil definition. Some hydric soils lack a currently described indicator. A hydric soil is defined by NTCHS as a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. Anaerobic conditions during the growing season, as considered by NTCHS, occur when soil microbes are active, which is year-round in the southeastern United States. The required duration for conditions to be considered anaerobic is 14 consecutive days.

The observations at the three sites and the monitoring equipment confirmed that, for the most part, the soils with a hydric soil indicator were indeed wet by the technical standard. The anomalous soil pedons that did not meet a current hydric soil indicator seemed to show a trend of frequent saturation that was of shorter duration than established as a technical standard by NTCHS. But neither case proved conclusive with the current study. Graphs of rainfall events over the previous 6-month period show repeated frequency. On wetter soils, which have indicators that meet the technical standard, there is sustained saturation to a depth of 6 inches. The anomalous areas (with the exception of the Tibbie site in Washington County) were characterized by short-duration, rapidly rising and falling water tables at depths between 6 and 12 inches, did not show hydric soil indicators, and did not meet the technical standard. The Tibbie type location had no current hydric soil indicator but met the technical standard for water table duration to a depth of 6 inches.

Four conditions are necessary to form redoximorphic features: organic matter, active bacteria, saturation, and stagnant water (anaerobic conditions). Bacteria digest organic matter and produce hydrogen ions and electrons that combine with oxygen to produce water molecules. Under saturated conditions, there is an excess of electrons that begin to attach to the rust-colored iron oxides (Fe^2) producing reduced iron (Fe^3). Whereas oxidized iron is insoluble, reduced iron is soluble and therefore can be removed or stripped from the soil particles, resulting in a grayish color. Therefore, in the context of other site factors and pedon factors, saturated conditions are indicated by gray colors or by splotchy gray and rust colors. For this process to result in visual redoximorphic features (including those associated with hydric soil indicators), a supply of organic matter and the bacteria to digest the organic matter are absolutely necessary. Therefore, in some areas the factors affecting redoximorphic processes in these anomalous bogs may include the interaction of the relative paucity of organic matter due to the lesser biomass of small shrubs and forbs and a limited overstory

canopy; the bacterial component in a somewhat toxic (aluminum), nutrient poor, low pH soil environment; frequent wildfires; bioturbation from numerous crawfish burrows; and extensive exposure to heat from the sun.

One hypothesis concerning the redox reactions on the anomalous sites is that the system governing the reduction environment was overwhelmed by dissolved iron. The sources of iron are obvious in the landscape. Plinthite masses, nodules, and concretions were not only part of every single in-situ profile under discussion but were also prevalent throughout the soil landscape. It is possible that reduced iron may be constantly supplied to some of these bog sites in the laterally flowing groundwater. The question arises, "Are soil matrices in the anomalous areas being constantly supplied with a replenishing source of iron that reoxidizes on the sandy particles upon drying, or is the microbial community overrun with more iron (and oxygen?) than it can fully process, or both?"

A hydric soil indicator along the Gulf Coast of Texas was suggested for testing throughout the Coastal Plain. Testing and research regarding a similar situation is ongoing in the mid-Atlantic region. This test field indicator can be used from a standpoint of wetland delineation, but use of this indicator requires documented proof of hydrology, vegetation, and landscape position. ■

Figure 3.—Field day participants, April 16, 2013 (left to right): Jim Duffy, SOI–USFWS–WSFR–CIAP, Daphne, Alabama; Louise Duffy, Tuscaloosa Testing Labs, Summerdale, Alabama; Jim Teaford, Eufaula, Alabama; Lawrence McGhee, USDA–NRCS, Auburn, Alabama; Al Schotz, Alabama Natural Heritage Program, Auburn, Alabama; Gena Todia, Wetland Resources Environmental Consulting, Fairhope, Alabama; Steve Monteith, USDA–NRCS, NSSC, Lincoln, Nebraska; Chris Noble, U.S. Army Corps of Engineers, Vicksburg, Mississippi; Paul Rodrigue, USDA–NRCS, Grenada, Mississippi; Lenore Matula Vasilas, USDA–NRCS, Beltsville, Maryland; Ralph Thornton, USDA–NRCS, Hattiesburg, Mississippi; Delaney Johnson, USDA–NRCS, Jackson, Mississippi; Jacob Berkowitz, U.S. Army Corps of Engineers, Vicksburg, Mississippi; Anthony (Tony) Jenkins, USDA–NRCS, Bangor, Maine; Mike Lilly, USDA–NRCS, Brandon, Mississippi; Aaron Miller, USDA–NRCS, Santa Fe, New Mexico; Sandy Page, USDA–NRCS, Loxley, Alabama; Steve Lawrence, USDA–NRCS, Athens, Georgia; Jerome Langlinais, USDA–NRCS, Loxley, Alabama; and Wade Hurt, University of Florida, Gainesville, Florida.

SBAAG Ad Hoc Committee on Soil Survey Office Computer Configurations

By Joe Norris, GIS Specialist, Soil Survey Regional Office 7

As the GIS specialist for Soil Survey Region 7, I was selected to serve on the National Soil Business Area Advisory Group (SBAAG) Ad Hoc Committee on Soil Survey Office Computer Configurations. The committee, under the leadership of David Hoover, National Leader for Soil Business Systems, was able to make major strides in the development of computer configurations for current and future national purchases of hardware. The team was deemed worthy to be continued and was granted permission to continue working on other relevant and persistent issues facing the agency. Some of the items of discussion were:

Hardware and Software

- ArcMap local server
- Management of field large data sets
- ArcGIS 10.2 and beyond, especially criteria for migrating to a higher version of ArcGIS

Backup and Archive

- The need for a Cloud solution
- Off-site backup
- Establishment of a new protocol for soil survey office backup
- Scheduling backup times based on usage metrics to conserve computing bandwidth
- Federal partnerships for acquiring and publishing local and enterprise-wide web-based services for LiDAR data
- ArcGIS Online (AGOL) for NRCS users
- Short- and long-term strategies to address bandwidth requirements

Please email me (joe.norris@al.usda.gov) if you have any concerns or issues related to the enhancement of workflow or performance of computers and network systems in the region. I would like to elevate such concerns or issues to the national level through team discussions. ■

New State Soil Scientist for Alabama

Lawrence McGhee was recently selected to serve as state soil scientist for Alabama. McGhee has been employed with NRCS for 27 years. He served as assistant state soil scientist since 2011. He was MLRA soil survey leader for Office 15-4 in Auburn, Alabama, from 2008 to 2011. He served as a soil survey project leader in the completion of three soil surveys in Alabama. He has extensive experience with the MLRA concept, working many years in the Blackland Prairie, Coastal Plain, and Southern Piedmont Regions. He served as a party member in the completion of two soil surveys in Indiana, and he completed a detail in northern Minnesota. He conducted soil survey updates on two military installations and on National Forest Lands in Alabama.

McGhee received a B.S. degree from Alabama A & M University in 1982 and a M.S. degree from Purdue University in 1986. He is a registered professional soil classifier in the State of Alabama and a member of the Soil and Water Conservation Society of America. In 2002, he represented NRCS at the 17th World Congress of Soil Science in Bangkok, Thailand. In 2005, McGhee retired from the U.S. Army Reserves after 22 years of service. He is a veteran of the Iraq War. ■

Alabama State Soil Scientist Lawrence McGhee

New MLRA Soil Survey Leader at Ft. Myers, Florida

Craig Prink has been selected to be the new leader for MLRA Soil Survey Office 7-For at Ft. Myers, Florida.

Craig is originally from southern Minnesota, where he was raised on farming and beekeeping. He went to college at the University of Wisconsin—River Falls, graduating in 1987 with a degree in soil science. He has worked for SCS and NRCS for the past 25 years. He began his career with SCS in 1988 at Douglas, Arizona. He transferred to Fergus Falls, Minnesota, in 1990 and then on to Milaca, Minnesota, in 1995. He was promoted to soil survey party leader and transferred to Gillette, Wyoming, in 1996. In 2004, he was selected as MLRA soil survey project leader for Evanston, Wyoming; and in 2008 he transferred to Tucson, Arizona. He has completed soil mapping on farmland, rangeland, forestland, fish and game or wildlife land, and lands owned or managed by the U.S. Forest Service, the Bureau of Land Management, and various States. He is recognized as a million-acre mapper.

He has participated in three remote sensing projects, projecting soil mapping with GIS in Wyoming and Arizona. He has conducted field assists and progress field reviews for over 6 years and has provided QA and QC on initial soil surveys. He has completed reconnaissance into older surveys, created project plans to initiate soil survey updates, and started soil data join recorrelation projects. He has also had the opportunity to complete technical soil services in a dual role in Wyoming and Arizona.

Craig is looking forward to working in Florida and to meeting everyone in the soil survey region. He will be starting in Ft. Myers on November 18th. ■

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