NEON Site-Level Plot Summary
Dead Lake (DELA)

Document Information

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Site Background

The Dead Lake Site is just northeast of Demopolis, AL near the Black Warrior River. The site is in Major Land Resource Area (MLRA) 133A–Southern Coastal Plains, near the boundary of MLRA 135A–Alabama and Mississippi Blackland Prairie. The site consists of 1,015 acres and is in on flood plain steps and stream terraces of an inside meander of the Black Warrior River in Greene Co., AL.

Site Information

Elevation ranges from approximately 60 to 90 feet above sea level.

The parent materials at the DELA site are some recent but mostly older alluvial Quaternary aged deposits. The upstream source of the alluvium is mainly Cretaceous aged Eutaw and Tuscaloosa formations.

Land use on site is dominated by forest land. A few areas are open wildlife plantings and some natural wetland areas.

Plant communities are mainly bottomland hardwood forest, oak and hickory with some pine on higher positions.

Major soil series on the site include Angie and Leaf, with lesser areas of Cahaba, Dulac and inclusions of Annemaine.

These soils are on the following landforms: flood plain steps and stream terraces

Analysis of Plots for Sampling

The inside meander on which this site is located on makes very subtle changes across the area. Vegetation was relatively uniform. A variety of locations across the flood plain steps and stream terraces were selected based on elevation, physiography, vegetative communities and soil map units. Soil mapping consisted of 8 different map units (including water), but the pre-selected sampling plots occurred in only 4 of the map units. The analysis resulted in 21 plots being selected for field description, field sampling, and lab characterization. All 21 sites were sampled including 4 tower sites that were sampled by bucket auger.

Roughly 22.6 percent of the NEON site area (50% of the site's total map units) at DELA consisted of map units that were not sampled. These include:

Map unit symbol	Map Unit Name	% Total site area
Bb	Bibb silt loam	0.4
CaB	Cahaba fine sandy loam, 0 to 3 percent slopes	2.9
DuA	Dulac silt loam, 0 to 2 percent slopes	3.8
W	Water	15.5
	Total	**22.6**

Sampled map units represent approximately 77.4 percent of the NEON site area (50% of the site's total map units):

Map unit symbol	Map Unit Name	% Total site area
AS	Angie-Leaf association	12.8
Le	Leaf silt loam	4.1
LF	Leaf-Angie association	35.2
Oc	Ochlockonee fine sandy loam	25.3
	Total	**77.4**

The selected sample plots are typical for the map unit delineation. The plots are a wide cross section of the series in the map units and similar soils (inclusions). For the most part, the series indicated fall within or near the Range in Characteristics (RIC) of the individual major component, except for a few outliers (noted below). The plot selection is well placed to pick up the subtle elevation changes in this relatively flat area. Most elevations of the flood plain steps, stream terraces and even a natural levee area are represented in the sampling.

Plot Findings

The 21 pedons sampled represent 4 soil map units. The major components are Angie, Cahaba, Leaf, and Ochlockonee with inclusions of Annemaine, Bethera, Chenneby, Lenoir, Tawcaw and Wehadkee. It is important to note that the subtle elevation changes are intermingled at the site. Most of these series vary only by one or two physical characteristics. Not all series described are represented in the original soil survey, but if mapped today would be included in the map units. All plots (100%) were sampled in forest vegetation.

Landforms—NEON Plots DELA_010, 011, 015, 016, 020, 021, 024, 025, 028, 029, 037, 038, 040 and 041 are on flood plain steps. Plots DELA_002, 003, 008, 009, 014 and 023 are on stream terraces. Plot DELA_005 is more recent alluvium on a natural levee. Sampled plots were 67% flood plain steps, 28% stream terrace, and 5% natural levee.

Summary of Soils

All of the soils were sampled under forest cover and generally had very thin organic horizons. These horizons ranged from 1 to 3 cm in thickness. These were not described or sampled.

The most dominant soil was the Angie series (MU's As, Lf, Oc and Le, 9 samples) on stream terrace positions. These 9 plots include Angie, Annemaine and similar soils. (DELA_002, 003, 009, 015, 016, 023, 024, 025 and 028). Angie and Annemaine only differ in irregular decrease in clay in the lower subsoil. (Paleudult vs. Hapludult) These soils developed in clayey alluvium from marine deposits and are >2.0 meters to bedrock (very deep). They are moderately well drained. These soils have an increase in clay content in the subsoil (i.e., an argillic horizon) and are fine (>35% clay). Field-estimated clay content ranged from about 32 to 44 percent. Of the pedons sampled as Angie, Angie-like and Annamaine, 6 fit the Angie range of characteristics (RIC). These are DELA_003, 015, 016, 023, 024 and 028. One of the plots was sampled as Angie-like (DELA_025). It differs from Angie in that the particle size control section (PSCS) averaged just less than 35% clay. The two samples collected as Annemaine differed from Angie because there was an irregular decrease in clay in the lower subsoil (DELA_002 and 009).

The second most common soil series was Cahaba soil (MU's Lf, Oc, 4 samples) on lower elevations of the stream terrace (DELA_010, 020, 021 and 029). These soils are similar to the Angie and Annemaine above, the main difference being fine-loamy in the PSCS. These Cahaba samples were located in Angie-Leaf associations and represent a lower clay content inclusion in the units. Field-estimated clay content ranges from 27 to 35% in the subsoil.

The next most prominent series sampled was the Leaf soil (MU Le, 2 samples: DELA_038 and 041). These are the two western most tower plots sampled by auger. They are on an alluvial flat near and oxbow lake. These fit the RIC for Leaf and represent the lower and wetter areas on the map unit. Leaf is very deep and poorly drained. It is has a fine PSC which averages 35 to 44% clay. These plots were mostly bottomland obligate wet hardwoods. Some pines were present on micro highs.

That leaves one plot each of the Chenneby (MU Oc, DELA_005), Bethera (MU Le, DELA_008), Ochlockonee (MU Oc, DELA_011), Lenoir (MU Oc, DELA_014), Tawcaw (MU Le, DELA_040) and Wehadkee (MU Le, DELA_037) soils.

The Chenneby (DELA_005) plot was an inclusion in the large Oc-Ochlockonee unit in the flood plain. It is the location that best represents the natural levee area on the east side of the meander peninsula. It is more recent alluvium and high in silt content. Physically, the description fits the Chenneby RIC but Chenneby is usually mapped further north in Alabama and Mississippi. Typically, it is very deep and somewhat poorly drained. This plot differs in that it is moderately well drained. It has a fine-silty subsoil with just light structural development in the subsoil. Clay content averaged between 17 to 30%.

The Bethera (DELA_008) plot is a similar soil to the Leaf series. This plot is located in a Leaf unit west of the oxbow lake. It differs from the above described Leaf soil in that the evidence of perched water shows up in the subsoil instead of the elluvial or E horizon. All other factors are similar to the Leaf soil.

The Ochlockonee (DELA_011) plot is the southernmost tip of the peninsula in the Oc-Ochlockonee unit. This is the best example of Ochlockonee we found in this unit. The field

estimates for the soils in this unit kept exceeding the maximum clay allowable in the RIC (18% average in the PSCS). It also did not meet sand content requirements by field estimates. Lab data will have to decide. This has a large content of very fine sand which in the field can be mistaken for coarse silt. It is right on the coarse-loamy/fine-silty line. All other characteristics fit the RIC. It is very deep and well drained. Clay content is in the 18 to 22% range. It is devoid of subsoil development and has evidence of stratification indicative of younger more recent alluvial deposits that are expected in this position.

The Lenoir (DELA_014) plot is in the Oc unit as an inclusion. It is near a low area of the adjoining Leaf unit. It is more similar to Leaf soil. The main difference is that it's somewhat poorly drained instead of poorly drained. Other characteristics are similar to Leaf. It is very deep and has fine PSCS. Clay averages above 35%.

The Tawcaw (DELA_040) plot is the southeastern most tower plot collected by auger. This inclusion is in the LF-Leaf-Angie association. It is similar to the Leaf soil except it is on slightly higher (micro highs) positions and is somewhat poorly drained instead of poorly drained. Another difference is the subsoil does not show as much development (Cambic instead of Argillic). Also the silt content may be a little higher (lab data will tell). Clay content was consistent throughout with an average of 35 to 45%.

The Wehadkee (DELA_037) plot was the eastern most tower plot collected by auger. It is also in the same LF map unit. This represents a higher position on the flood plain than the Leaf soil. The clay content in the subsoil is lower than that of Leaf and has less development. This indicates a more recent deposit than Leaf. It is poorly drained but tends to be sandier or have coarser sand than the surrounding sites.