

Supplementary Material for “A review of native vegetation types in the Black Belt of Mississippi and Alabama, with suggested relationships to the catenas of soil series”: general characteristics of soil series, plus general interpreted relationships with topography and presettlement vegetation.

The charts below include virtually all soil series that occur in the Black Belt region of Mississippi and in transitions to the Pontotoc Ridge (with more sand, overlying the chalk). Excluded here are more sandy or acid soils associated with other sections of the Gulf Coastal Plain: e.g., Smithdale, Luverne, Ruston, Providence, Lexington (uplands); and Bibb, Tuka, Urbo (lowlands).

See paper for complete bibliography. Most data come from the following two sources.

U.S.D.A. Natural Resources Conservation Service [NRCS]. 2010a. Official Soil Series Descriptions (OSD) with series mapping capabilities [<http://soils.usda.gov/technical/classification/osd/index.html>].

U.S.D.A. Natural Resources Conservation Service [NRCS]. 2010b. Soil Surveys for Counties of the U.S.A. [<http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>].

Explanation of format for data on soils.

First line.

(a) Soil class, with preceding abbreviations for modifiers:

a = alfic; ch = chromic; cu = cumulic; d = dystric; f = fluventic; fa = fluvaquentic; h = humic; le = leptic; li = lithic; m = mollic; o = oxyaquic; q = aquic; r = rendollic; t = typic; v = vertic.

(b) At right margin, color of A horizon is coded using following symbols:

b = brown; d = dark; g = gray(ish); l = light; m = mottled; o = olive; r = red(dish); v = very dark; y = yellow(ish).

Second line.

(a) Name of soil series, with abbreviations for typical texture (excluding eroded clayey phases on steeper slopes):

c = clay; csl = cherty silt loam; fsal = fine sandy loam; l = loam; sa = sand; sic = silty clay; sicl = silty clay loam; si = silt; sil = silt loam; shsil = shaly silt loam; rl = rocky loam (or mixture); rsic = rocky (or flaggy) silty clay.

(b) At right margin, color of mid-to-upper B horizon is coded using same symbols as listed under First Line (b).

Third line.

(a) Typical slope in percent; followed by typical depth to bedrock in feet.

(b) At left margin, asterisks (*) indicate that slopes are locally steep enough for significant differences in soil and vegetation on N/NE-facing versus S/SW-facing aspects.

(c) At right margin, general drainage class is coded as follows:

1 = very poorly drained; 2 = poorly drained; 3 = somewhat poorly drained; 4 = moderately well-drained; 5 = well-drained; 6 = somewhat excessively drained; 7 = excessively drained.

Fourth line.

(a) Parent material, with abbreviations as follows: >> = thick loess mantle; > = thin or patchy loess mantle; As = acid shale; Ca = acid clay; Cc = calcareous clay (often mixed with Ch); Ck = chalky limestone (with marl); Ct = cherty limestone; Cs = calcareous shale; Li = limestone (arg = argillaceous); Sa = sandstone; Sh = shale (undifferentiated),

(b) Followed by topographic context: bot = bottomland (with generally fresh alluvium); col = colluvium; dep = alluvial depression (tending to sla); flu = fluvial; fin = fine-textured; mar = marine; med = medium-textured; pon = ponded alluvium (tending to sla); res = residuum; sla = slack-water deposits (with fine-textured alluvium on bottomlands, terraces or locally uplands); ter = terrace (with generally weathered alluvium); upl = uplands (often with undifferentiated residuum or colluvium).

(c) At right margin, typical pH of topsoil (ca. 0-8 inches deep), with coding as follows:

A = 4.5-5 (very strongly acid); B = 5.1-5.5 (strongly acid); C = 5.6-6 (medium acid);

D = 6.1-6.5 (slightly acid); E = 6.6-7.3 (circumneutral); F = 7.3-8 (alkaline).

Note: in most cases pH is less in mid to low horizons by up to 1 unit or so; > indicates a strong trend in this direction; < indicates the opposite trend; ~ indicates much variation without overall trend.

TYPICAL TOPO-GRAPHY	MORE HILLY LANDSCAPES IN GENERAL shallow/rocky soil		INTERMEDIATE LANDSCAPES IN GENERAL moderate to deep		LESS HILLY LANDSCAPES IN GENERAL less well-drained
Mixed uplands or high terraces: fine sandy loams to silt loams		t-Kandiudult b Faceville fsal r 0-15; >60 5 old mar/flu clay B	g-Fragiudult db Prentiss lo yb 0-8; >60 4 old mar/flu ter B>	fa-Paleudult vdg Brewton fsal yb 0-4; 60-80 3 old mar/flu ter B>	t-Paleaquilt vdg Trebloc sil g/ybm 0-2; 60-80 2 old mar/flu dep A
Sandy uplands or high terraces: sandy loams to fine sandy loams		t-Fragiudult vdg Ora sal yr 0-12; >60 4 old mar/flu ter B	t-Fragiudult dgb Savannah fsal yb 1-15; 50-80 4 old mar/flu ter B>	fa-Paleudult dgb Stough fsal yb 0-5; >60 3 old mar/flu ter B>	Note: Brewton is close to Stough but more eluviated (in A2/E horizons)
Clayey uplands: acid clay and locally sand or silt overlying chalk	u-Hapludalf b Brantley fsal db *0-35; 40-60 5 upl: med-fin D>	v-Paleudalf dgb Boswell fsal r 1-17; >60 4 Ca upl B	v-Paleudalf dg Kipling sil yb *0-40; 40-80 3 Ca upl/ter C>	a-Hapludert vgb Brooksville sicl dgb 0-5; 40-70 3 Ca upl C<	ch-Dystraquept vg Eutaw sic yb 0-2; c. 80 2 Ca upl A>
Clayey uplands: acid clay overlying chalk; not loamy		le-Hapludert dyb Watsonia c yr *1-25; 10-20 5 Ca upl C<	ch-Dystrudert db Oktibbeha c yb *1-30; 60-80 4 Ca upl D>	a-Dystrudert vgb Vaiden c yb 0-5; 60+ 3 Ca upl/ter D>	
Chalky uplands: gentle slopes with influence of overlying clay		o-Hapludert o Maytag sic og 1-12; 45-60 5 Ck upl E	o-Hapludert vgb Okolona sic o 0-5; 40-65 5 Cc upl E	o-Hapludert vg Houston cl og 0-8; 50-100 4 Cc upl E	Note: "Houston" has often eroded down to Sumter (Gibson 1941)
Chalky uplands: steeper side-slopes to local alluvial flats with clay	t-Haprendoll vdg Binnsville sic log 1-17; 7-20 5 Ck upl F	r-Eutrudept g Sumter sic lyb *1-40; 20-40 5 Ck upl F	a-Hapludert dog Griffith sic og 0-2; c. 60 4 Cc all F	ch-Epiaquept dyb Sucarnochee sic og 0-2; 60+ 3 Cc all E	
Chalky uplands: loamy toe-slopes, swales and alluvial lowlands	Note: undescribed soil here on mesic NE-facing bluffs with sugar maple	t-Udorthernt dgb Demopolis sicl dgb *1-35; 10-20 5 Ck upl F	a-Hapludert vgb Faunsdale cl lob 0-5; 60+ 3 Cc toe E	v-Epiaquept dgb Leeper sicl dgb 0-3; 20-60 3 Cc all F	
Floodplains: loamy alluvium along perennial streams			fa-Hapludert b Marietta l dgb 0-2; 30-60 4 loamy all E	a-Fluvaquent dgb Belden sicl gb 0-2; 45-60 3 silty/loamy all D	Note: more open marshy wetland soils need definition here
Floodplains: deep clayey alluv. along streams and backwater sloughs		t-Hapludert vdg Trinity c dog 0-3; >80 5 clayey all F	fa-Hapludoll vgb Catalpa sicl dgb 0-3; 60+ 3/4 clayey all E	v-Epiaquept vgb Tuscumbia sicl g 0-2; >50 2 clayey all D~	t-Epiaquept vgb Una sic lb 0-4; >60 2 acid clayey all B<

Composite chart with soil data; see explanation on previous page.

Blue-shaded soil series are mapped at the Pulliam Prairie (darker) or nearby (lighter) in Chickasaw County; others may well occur there locally, including intermediate soils between the standard series. Green-shaded soil series are additional soils mapped at significant vegetation in Oktibbeha County: the Sand Creek Chalk Bluff (Morris et al. 1993), the Osborn Prairie (Leidolf and McDaniel 1998) and adjacent oak woods (Hill et al. 2009); note that much Savannah is on exogenous fine sandy terraces. The mapped soils at these Oktibbeha County sites overlap to a limited extent with the Pulliam Prairie: they do include Kipling, Leeper and Catalpa in common.

TYPICAL TOPO-GRAPHY	MORE HILLY LANDSCAPES IN GENERAL shallow/rocky soil		INTERMEDIATE LANDSCAPES IN GENERAL moderate to deep		LESS HILLY LANDSCAPES IN GENERAL less well-drained
Mixed uplands or high terraces: fine sandy loams to silt loams		Ultisol	Ultisol	Ultisol	Ultisol
Sandy uplands or high terraces: sandy loams to fine sandy loams		Ultisol	Ultisol	Ultisol	
Clayey uplands: acid clay and locally sand or silt overlying chalk	Alfisol	Alfisol	Alfisol	Vertisol	Inceptisol
Clayey uplands: acid clay overlying chalk; not loamy		Vertisol	Vertisol	Vertisol	
Chalky uplands: gentle slopes with influence of overlying clay		Vertisol	Vertisol	Vertisol	
Chalky uplands: steeper side-slopes to local alluvial flats with clay	Mollisol	Inceptisol	Vertisol	Vertisol	
Chalky uplands: loamy toe-slopes, swales and alluvial lowlands	to be described: mesic NE-facing bluff with sugar maple	Entisol	Vertisol	Inceptisol	
Floodplains: loamy alluvium along perennial streams			Vertisol	Entisol	
Floodplains: deep clayey alluv. along streams and backwater sloughs		Vertisol	Mollisol	Inceptisol	Inceptisol

Broad Soil Classes.

TYPICAL TOPO-GRAPHY	MORE HILLY LANDSCAPES IN GENERAL shallow/rocky soil		INTERMEDIATE LANDSCAPES IN GENERAL moderate to deep		LESS HILLY LANDSCAPES IN GENERAL less well-drained
Mixed uplands or high terraces: fine sandy loams to silt loams		fine sandy loam	loam	fine sandy loam	silt loam
Sandy uplands or high terraces: sandy loams to fine sandy loams		sandy loam	fine sandy loam	fine sandy loam	
Clayey uplands: acid clay and locally sand or silt overlying chalk	fine sandy loam	fine sandy loam	silt loam	silty clay loam	silty clay
Clayey uplands: acid clay overlying chalk; not loamy		clay	clay	clay	
Chalky uplands: gentle slopes with influence of overlying clay		silty clay	silty clay	clay	
Chalky uplands: steeper side-slopes to local alluvial flats with clay	silty clay	silty clay	silty clay	silty clay	
Chalky uplands: loamy toe-slopes, swales and alluvial lowlands		silty clay loam	clay loam	silty clay loam	
Floodplains: loamy alluvium along perennial streams			loam	silty clay loam	
Floodplains: deep clayey alluv. along streams and backwater sloughs		clay	silty clay loam	silty clay loam	silty clay

Soil Texture of A horizon.

TYPICAL TOPO-GRAPHY	MORE HILLY LANDSCAPES IN GENERAL shallow/rocky soil		INTERMEDIATE LANDSCAPES IN GENERAL moderate to deep		LESS HILLY LANDSCAPES IN GENERAL less well-drained
Mixed uplands or high terraces: fine sandy loams to silt loams		7	5	2	1
Sandy uplands or high terraces: sandy loams to fine sandy loams		6	4	3	
Clayey uplands: acid clay and locally sand or silt overlying chalk	17	9	20	3	1
Clayey uplands: acid clay overlying chalk; not loamy		15	15	3	
Chalky uplands: gentle slopes with influence of overlying clay		6	3	4	
Chalky uplands: steeper side-slopes to local alluvial flats with clay	10	20	1	1	
Chalky uplands: loamy swales, toeslopes and alluvial lowlands		20	3	1	
Floodplains: loamy alluvium along perennial streams			1	1	
Floodplains: deep clayey alluv. along streams and backwater sloughs		2	2	1	2

Average Slope: degrees.

In all soil series, slope varies greatly, with some present on more or less level ground (with 0-3% slope) in each case. The more sloping variants of each soil series are often present at eroding edges of more gentle slopes or flats.

TYPICAL TOPO-GRAPHY	MORE HILLY LANDSCAPES IN GENERAL shallow/rocky soil		INTERMEDIATE LANDSCAPES IN GENERAL moderate to deep		LESS HILLY LANDSCAPES IN GENERAL less well-drained
Mixed uplands or high terraces: fine sandy loams to silt loams		70	70	70	70
Sandy uplands or high terraces: sandy loams to fine sandy loams		70	70	70	
Clayey uplands: acid clay and locally sand or silt overlying chalk	50	65	60	55	80
Clayey uplands: acid clay overlying chalk; not loamy		15	70	70	
Chalky uplands: gentle slopes with influence of overlying clay		52	52	75	
Chalky uplands: steeper side-slopes to local alluvial flats with clay	15	30	60	70	
Chalky uplands: loamy swales, toeslopes and alluvial lowlands		15	60	40	
Floodplains: loamy alluvium along perennial streams			45	52	
Floodplains: deep clayey alluv. along streams and backwater sloughs		80+	70	70	70

Average Depth of Soil (to bottom of C horizon): inches

TYPICAL TOPO-GRAPHY	MORE HILLY LANDSCAPES IN GENERAL shallow/rocky soil		INTERMEDIATE LANDSCAPES IN GENERAL moderate to deep		LESS HILLY LANDSCAPES IN GENERAL less well-drained
Mixed uplands or high terraces: fine sandy loams to silt loams		5	4	3	2
Sandy uplands or high terraces: sandy loams to fine sandy loams		4	4	3	
Clayey uplands: acid clay and locally sand or silt overlying chalk	5	4	3	3	2
Clayey uplands: acid clay overlying chalk; not loamy		5	4	3	
Chalky uplands: gentle slopes with influence of overlying clay		5	5	4	
Chalky uplands: steeper side-slopes to local alluvial flats with clay	5	5	4	3	
Chalky uplands: loamy swales, toe-slopes and alluvial lowlands		5	3	3	
Floodplains: loamy alluvium along perennial streams			4	3	1? (ponds)
Floodplains: deep clayey alluv. along streams and backwater sloughs		5	3-5	2	2

Drainage Classes:

5 = well-drained; 4 = moderate; 3 = somewhat poorly; 2 = poorly drained; 1 = very poorly drained.

TYPICAL TOPO-GRAPHY	MORE HILLY LANDSCAPES IN GENERAL shallow/rocky soil		INTERMEDIATE LANDSCAPES IN GENERAL moderate to deep		LESS HILLY LANDSCAPES IN GENERAL less well-drained
Mixed uplands or high terraces: fine sandy loams to silt loams		B	B>	B>	A
Sandy uplands or high terraces: sandy loams to fine sandy loams		B	B>	B>	
Clayey uplands: acid clay and locally sand or silt overlying chalk	D>	A	C>	C<	A> (4-4.5 below)
Clayey uplands: acid clay overlying chalk; not loamy		C<	D>	D>	
Chalky uplands: gentle slopes with influence of overlying clay		E	E	E	
Chalky uplands: steeper side-slopes to local alluvial flats with clay	F	F	F	E	
Chalky uplands: loamy swales, toe-slopes and alluvial lowlands		F	E	F	
Floodplains: loamy alluvium along perennial streams			E	D	
Floodplains: deep clayey alluv. along streams and backwater sloughs		F	E	D~	B<

Typical pH of upper (A) horizon:

A = 4.5-5; B = 5.1-5.5; C = 5.6-6; D = 6.1-6.5; E = 6.6-7.5; F = 7.6-8.5

Note that in most cases pH is less in mid to low horizons by 0-1 units;

">" indicate a strong trend;

"<" indicates the opposite trend;

"~" = highly variable

TYPICAL TOPO-GRAPHY	MORE HILLY LANDSCAPES IN GENERAL shallow/rocky soil		INTERMEDIATE LANDSCAPES IN GENERAL moderate to deep		LESS HILLY LANDSCAPES IN GENERAL less well-drained
Mixed uplands or high terraces: fine sandy loams to silt loams		brown	dark brown	very dark gray	very dark gray
Sandy uplands or high terraces: sandy loams to fine sandy loams		very dark gray brown	dark gray brown	dark gray brown	
Clayey uplands: acid clay and locally sand or silt overlying chalk	brown	dark gray brown	dark gray	very dark gray brown	very dark gray
Clayey uplands: acid clay overlying chalk; not loamy		dark yellow brown	dark brown	very dark gray brown	
Chalky uplands: gentle slopes with influence of overlying clay		olive	very dark gray brown	very dark gray	
Chalky uplands: steeper side-slopes to local alluvial flats with clay	very dark gray	gray brown	dark olive gray	dark yellow brown	
Chalky uplands: loamy swales, toeslopes and alluvial lowlands		dark gray brown	very dark gray brown	dark gray brown	
Floodplains: loamy alluvium along perennial streams			brown	dark gray brown	
Floodplains: deep clayey alluv. along streams and backwater sloughs		very dark gray	very dark gray brown	very dark gray brown	very dark gray brown

Typical color of upper A horizon (topsoil);

color graphic balances are as follows in Microsoft Word (red-yellow-blue).

r: 255 0 0; yr: 255 153 0; dyb: 144 123 0; yb: 204 153 0; lyb: 184 158 0; db: 105 51 0; b: 164 82 0; lb: 176 117 58;
dob: 178 131 0; lob: 217 160 56; o: 204 153 0; oy: 204 180 0; dog 178 131 0; og 175 159 64; log 191 175 81;
vdgb: 81 63 49; dgb: 107 83 65; gb: 139 108 85; vdg: 51 51 51; dg: 76 76 76; g: 100 100 100

TYPICAL TOPO-GRAPHY	MORE HILLY LANDSCAPES IN GENERAL shallow/rocky soil		INTERMEDIATE LANDSCAPES IN GENERAL moderate to deep		LESS HILLY LANDSCAPES IN GENERAL less well-drained
Mixed uplands or high terraces: fine sandy loams to silt loams		red	yellowish brown	yellowish brown	gray w/yb mottle
Sandy uplands or high terraces: sandy loams to fine sandy loams		yellowish red	yellowish brown	yellowish brown	
Clayey uplands: acid clay and locally sand or silt overlying chalk	dark brown	red	yellowish brown	dark grayish brown	yellowish brown
Clayey uplands: acid clay overlying chalk; not loamy		yellowish red	yellowish brown	yellowish brown	
Chalky uplands: gentle slopes with influence of overlying clay		olive yellow	olive	olive gray	
Chalky uplands: steeper side-slopes to local alluvial flats with clay	light olive gray	light yellowish brown	olive gray	dark grey	
Chalky uplands: loamy swales, toe-slopes and alluvial lowlands		dark grayish brown	light olive brown	dark grayish brown	
Floodplains: loamy alluvium along perennial streams			brown	grayish brown	tbd: mottled?
Floodplains: deep clayey alluv. along streams and backwater sloughs		dark olive gray	dark gray brown	gray	light brown

Typical color of mid-upper B horizon (usually ca. 10-40 inches deep).

r: 255 0 0; yr: 255 91 0; dyb: 144 123 0; yb: 204 153 0; lyb: 184 158 0; db: 105 51 0; b: 164 82 0; lb: 176 117 58; dob: 178 131 0; lob: 217 160 56; o: 204 153 0; oy: 204 180 0; dog 178 131 0; og 175 159 64; log 191 175 81; vdgb: 81 63 49; dgb: 107 83 65; gb: 139 108 85; vdg: 51 51 51; dg: 76 76 76; g: 100 100 100

TYPICAL TOPO-GRAPHY	MORE HILLY LANDSCAPES IN GENERAL shallow/rocky soil		INTERMEDIATE LANDSCAPES IN GENERAL moderate to deep		LESS HILLY LANDSCAPES IN GENERAL less well-drained
Mixed uplands or high terraces: fine sandy loams to silt loams		cot,cor,pea	cot,cor,soy 25-50	for	for (willow oak+)
Sandy uplands or high terraces: sandy loams to fine sandy loams		cot,cor,smg	cot,cor,soy	for,pas 15-35	
Clayey uplands: acid clay and locally sand or silt overlying chalk	cot,soy,pas	for,pas 12-30	cot,soy,smg 15-40	cot,soy,sor	for (post oak+) 15-25
Clayey uplands: acid clay overlying chalk; not loamy		pas,hay,soy	for,pas,cot 15-30	cot,soy,cor 12-40	
Chalky uplands: gentle slopes with influence of overlying clay		pas,soy,sor	cot,soy,sor	pas,hay,soy 30-60	
Chalky uplands: steeper side-slopes to local alluvial flats with clay	pra,woo	pas,hay,smg 10-35	cot,cor,soy	pas,oil (for 5%)	
Chalky uplands: loamy swales, toeslopes and alluvial lowlands	for?	pas,hay	cot,pas,soy	cot,cor,soy 25-60	
Floodplains: loamy alluvium along perennial streams			cot,soy,cor	cot,cor,soy	for/pas? +ponds
Floodplains: deep clayey alluv. along streams and backwater sloughs		pas,cot,cor	pas,hay,cot	for,pas 15-40	for,pas 10-30

Typical land use (upper line):

Abbreviations: cotton, corn, peanuts, soybeans, small grains, oil-seed, hay, pasture, prairie, forest/woodland.

Numbers are provisional data on corn bushels per acre (from 1960 Soil Survey of Montgomery County, Alabama).