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Standards and Taxonomy Committee

Co-chairs

- ✓ Charles Love – State Soil Scientist/MO-15 Team Leader
- ✓ Dr. Joey Shaw – Associate Professor, Auburn University

Members of the Committee

Pam Thomas, South Carolina State Soil Scientist
Doug Slabaugh, Tennessee State Soil Scientist
Scott Anderson, MO-15 SDQS
Rick Robinns, Florida Soil Scientist
John Kelley, MO-14 SDQS

Standards and Taxonomy Committee Charges

<u>Soil Taxonomy</u>

***Charge # 1*: Review the existing proposal for new taxonomic classifications and provide recommendations to NSSC for adoption in *Soil Taxonomy*.**

Five groups of proposed Soil Taxonomy revisions were submitted to the committee for review.

Proposal #1:

1. Normal Years (NSSC Proposal) -- Statement added: "When evaluating precipitation data to determine if the criterion for the presence of aquic conditions, or number of days that the moisture control section is moist, or number of days that some part of the soil is saturated has been met, it is permissible to include data from periods with below normal rainfall. Similarly, when evaluating precipitation data to determine if the criterion for the number of days that the moisture control section is dry have been met, it is permissible to include data from periods with above normal rainfall. It is assumed that if the criteria are met during these periods, they will be met during normal years also."
2. Natraquerts (NSSC Proposal) -- Statement Added: Other Aquerts that have a natric horizon within 100 cm of the mineral soil surface. **(Low Priority for the South)**
   - Southeast Texas:
   - ***Impact to Existing Soil Series:***
     - **Aransas – Fine, Smectitic, Hyperthermic Typic Natraquerts**
     - **Franeau - Fine, Smectitic, Hyperthermic Typic Natraquerts**
3. Subaqueous Soils (Northeast Region) – This proposal was submitted through the Northeast Standards Committee by Mark Stolt, University of Rhode Island. The proposal is an extensive revision of the subaqueous soils proposal submitted in 2002. It addresses the concerns that were raised with the original proposal. Two new suborders are proposed for Entisols and Histosols; 'Wassents', and 'Wassists'. The formative element "Wass" is from the German word for water - "wasser." **(High Priority for the South)**

Proposal #2:

1. Ashy-skeletal over clayey contrasting particle-size class -- (**West Region) --** This proposal recommends the addition of a new strongly contrasting particle-size class named "Ashy skeletal over clayey". There is currently a strongly contrasting class of ashy over clayey which are listed first in the list of these classes. There are also ashy-skeletal over loamy-skeletal and ashy-skeletal over sandy or sandy-skeletal classes. These are listed as class numbers 10 and 11 in the list of classes. This action will change the classification. **(Low Priority for the South)**
2. Correction to Temperature regime limits **(NSSC & West Region Proposal**) – "difference between mean summer and mean winter soil temperatures is **6 degrees C or** more **than 6 degrees C.** This proposal does not change the current classification of any series. **(Low Priority for the South)**

3. Clarification of the Clay Content Requirement for Paleustalfs, Palexeralfs, and Palexerolls **(NSSC)** – The clay content criteria listed for the Paleustalfs (p. 59 of the Keys), Palexeralfs (p. 71), and Palexerolls (p. 224) refers to various clayey particle-size classes being present in the upper part of the argillic horizon. **The intent is to require 35% or more clay in the upper part (as written for the Paleustolls, page 209).** The use of particle-size class terms in this context is technically incorrect, because these soils do not have to be in a clayey family to meet the criterion. Proposal by Craig Ditzler and Bob Engel (retired), NSSC. **(Low Priority in the South)**

Machete the only known series that will require reclassification (**Puerto Rico)**:
Very-fine, Mixed, Active, Isohyperthermic Aridic Paleustalfs.

4. Cemented Layer Criteria for Four Great Groups (NCCS) -- Presence of a cemented soil horizon is a characteristic held in common by Durudands, Duricryepts, Durudepts, and Petraquepts. The wording used in the keys for each is a little different however from one to another. For example, the Durudands (p. 85 of Keys) have a *"cemented horizon that has its upper boundary…"*, while the Durudepts (p. 172) require *"a duripan or another cemented or indurated layer that has its upper boundary…***(Low Priority for the South)***"*

5. Micaceous Soils (See Series) (South Region Proposal) – A team of field and MLRA Office soil scientists in the South Region was assembled to study and evaluate how mica has historically been described in soil profile descriptions (official soil descriptions and field descriptions) and to determine if a need exists to refine quantification and description techniques as related to soil classification and making and interpreting soil maps. – Proposal provided by John Kelley **(High Priority for the South)**

6. Aridic Lithic Subgroups in Some Great Groups of Xerolls (West Region) -- The suborder of Xerolls are defined as "Other Mollisols that have either a xeric moisture regime or an aridic moisture regime that borders on xeric". The precedence in the great groups of Calcixerolls, Argixerolls, and Haploxerolls has been to establish subgroups for soil series defined in part by having an aridic moisture regime versus series in comparable subgroups that have a xeric moisture regime. **(Low Priority for the South)**

Proposal #3:
Gelisol Order - Proposal -- Permafrost Affected and Other Very Cold Soils --Proposed Changes to the 10th Edition of Keys to Soil Taxonomy Submitted by MLRA Regional Office #17 Staff **(West Region)** -- Current criteria for the Gelisols soil order include either: 1) the

presence of permafrost within 100 cm of the soil surface or 2) Gelic materials within 100 cm of the soil surface and permafrost within 200 cm of the soil surface. The presence of permafrost within the 200 cm depth of observation is the most important factor in terms of soil processes as well as land use. **(Low Priority for the South)**

Proposal #4:
To Add Humic Great Groups to the Udepts, Ustepts, and Xerepts And to Revise the Current Humic Subgroups in Various Great Groups (**South Region Proposal)** -- This is a proposal to add humic great groups to Udepts, Ustepts, and Xerepts and to change the definition of the humic subgroups in various Great Groups of Udepts, Ustepts, and Xerepts. This proposal was presented at the 2006 South Region Conference at Oklahoma City. **Proposed by:** Bill Craddock (KY), Roy Vick (NC), and Bob Engel (NSSC-retired). **(High Priority for the South) A group of series will be impacted based on these revisions.**

Proposal #5: **(Regional Soil Correlation Teams and Dense Soil Properties Group)** Kanhapludults, Paleaquults, Paleudults & Plinthudults (Plinthic Horizon) (**South Region)** MO-14 Proposal.

1. Kanhapludults -- It is proposed the **Kanhapludults** great group be revised by adding an *"Arenic Fragic"* subgroup. The Ailey series (Arenic Kanhapludult) is of large extent, with over 250,000 acres in 3 user states. Ailey soils have fragic soil properties in addition to the arenic feature. It is proposed the Kanhapludults great group be revised by adding an *"Arenic Fragic"* subgroup.

Impact to Existing Soil Series: Ailey is the only known series that will require reclassification.

2. Paleaquults -- Presently, both the "Grossarenic" and "Umbric" subgroups are recognized in the Paleaquults great group. The Starke series meets both subgroup criteria. Since the Grossarenic feature is listed first in the key, the umbric feature is not recognized in family classification. Adding a *"Grossarenic Umbric"* subgroup would better reflect soil characteristics not presently captured in the current classification.

Impact to Existing Soil Series:
Starke is the only known series identified in OSDS and the Soil Classification File (tentative or established) that have as series criteria both the Grossarenic and Umbric feature.

3. Paleudults - Presently, soils in the Paleudults great group that meet the feature criteria for the "Aquic" subgroup and are also grossarenic, key as "Aquic Arenic" Paleudults. Soils that meet the feature criteria for the "Oxyaquic" subgroup and are also grossarenic, key as "Oxyaquic" Paleudults. Soils that meet the feature criteria for the "Arenic" and "Plinthic" subgroup and are also oxyaquic, key as "Arenic Plinthic" Paleudults. It is proposed the Paleudults great group be revised by: 1) adding *"Aquic Grossarenic," "Grossarenic Oxyaquic," and "Arenic Plinthic Oxyaquic"* subgroups to the Paleudult great group, and 2) rearranging the subgroup order of Paleudults as to allow soils to key similarly to Kandiudults. **(High Priority for the South)**

Impact to Existing Soil Series:
Impact to current soil series is minimal. The revision is primarily directed toward the following soil series:

Great Group	*Proposed Subgroup*	Affected Soil Series	Present Subgroup	Extent	Approx. Acres
Paleudults	***Aquic Grossarenic***	Albany	Aquic Arenic	Large	250,000+
		Murad	Aquic Arenic	Small	8,000+
	Grossarenic Oxyaquic	Meldrim	Oxyaquic	Moderate	10,000+
	Arenic Plinthic Oxyaquic*	Stilson	Arenic Plinthic	Large	100,000+

* Identification of more than two subgroup features is rare in Soil Taxonomy. However, other examples are *"Aeric Chromic Vertic"* Epiaqualfs and *"Arenic Plinthaquic"* Paleudults/Kandiudults.

Proposed Subgroups and revised order of the Key.
(Numbers in parentheses indicate the number of series presently identified.):

Current Kandiudults (24)	Current Paleudults (237)	*Proposed Paleudults*
Arenic Plinthaquic (0)	**Vertic (3)**	Vertic
Aquic Arenic (0)	**Spodic (1)**	Spodic
Arenic Plinthic (1)	**Arenic Plinthaquic (4)**	*Aquic Grossarenic (2)*
Arenic Rhodic (0)	**Aquic Arenic (5)**	Arenic Plinthaquic
Arenic (2)	Anthraquic (0)	Aquic Arenic
Grossarenic Plinthic (0)	**Plinthaquic (7)**	Anthraquic
Grossarenic (3)	**Fragiaquic (14)**	Plinthaquic
Acrudoxic Plinthic (0)	**Aquic (31)**	Fragiaquic
Acrudoxic (0)	**Oxyaquic (10)**	Aquic
Plinthaquic (0)	**Lamellic (4)**	Grossarenic Plinthic
Aquandic (0)	**Arenic Plinthic (5)**	*Grossarenic Oxyaquic (1)*
Andic (0)	**Psammentic (4)**	Grossarenic
Aquic (0)	**Grossarenic Plinthic (2)**	*Arenic Plinthic Oxyaquic (1)*
Plinthic (4)	**Plinthic (13)**	Arenic Plinthic
Ombroaquic (0)	Arenic Rhodic (0)	Arenic Rhodic
Oxyaquic (0)	**Arenic (12)**	Arenic
Sombic (0)	**Grossarenic (13)**	Plinthic
Rhodic (4)	**Fragic (3)**	Fragic
Typic (10)	**Rhodic (11)**	Oxyaquic
	Typic (94)	Lamellic
		Psammentic
		Rhodic
		Typic

4. Plinthudults (Plinthic Horizon). Soil scientists who work in regions with soils that contain iron concentrations historically have struggled to consistently and accurately describe and quantify these materials. Local or regional application of concepts have added to the complexity of consistent soil correlation from county-to-county, state-to-state, and region-to-region. With the implementation of the major land resource area (MLRA) soil survey approach, it has become imperative to develop concepts and conventions that may be uniformly applied.

A review of plinthic soils in the Southeast U.S. clearly indicates a lack of consensus among university staff, field soil scientists, and correlators in how to identify, quantify, and ultimately correlate soils with these types of noncemented to indurated iron-rich materials. Many studies, field investigations, and research projects have been conducted in the past;

however, conclusions or recommendations from these studies have not been universally accepted or implemented as standards in the cooperative soil survey program. By adding cementation to the revised plinthite concept and providing a standard field slake test, ambiguity between progressively cemented materials is lessened.

With this revision, how Fe-rich materials respond once exposed to air and sunlight remains a common feature but is less important than in the present definition. To be identified as plinthite, it must now also exhibit a minimal degree of in situ cementation (hardening). Once initial cementation has occurred, the material responds from an engineering and management viewpoint as a pararock fragment. Once progressive cementation reaches the point of being strongly or more cemented it responds as a rock fragment. This change allows for a clear and more accurate quantification of the material, ultimately providing improved soil interpretations. Lowering the amount of plinthite required for the "plinth" great group allows for an improved separation of soils that have a wide range of content and type of cemented material.

The proposed plinthite concept is in line with other international soil classification systems and is very close to that used by the World Reference Base. Incorporating the proposed changes will add credibility to both systems. There is a potential for a few established soil series to require field investigation. Some series that presently have a wide range of plinthite content (e.g., 5 to 50 percent) may even require splitting into two separate series; however, this is thought to be a rarity. Changes to Official Soil Series Descriptions need not be immediate. Required changes may be made as the MLRA soil survey management system is implemented and as soil scientists begin to update soil surveys across major land resource areas.

Procedures and Standards

Subaqueous Soils

***Charge #2*: Identify needed changes to the *NSSH, Field Guide for Describing and Sampling Soils,* and *Soil Survey Manual* to accommodate Subaqueous Soil survey activities.**

The Southern Cooperative Soil Survey Steering Committee has established a Southern Region Subaqueous Soils Sub-committee. This sub-committee will work with NSSC and other regions to establish procedures and standards for the south region.