

Standards and Taxonomy Committee Report

North Central Regional Soil Survey
Conference – 2012

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Proposed Revisions to the future 12th Edition of Keys to Soil Taxonomy

Based on: ICOMANTH (International
Committee for Anthropogenic Soils)
Circular Letter 7. Dr. John M. Galbraith,
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Proposal: Change the Definition of Buried Soils

- “A buried soil is composed of one or more genetic horizons which are covered with *one* of the following:
- 1. A plaggen epipedon; *or*
- 2. A deposit of human-transported material 50 cm or more thick; *or*
- 3. A surface mantle of new soil material (defined below). The minimum thickness of the mantle is *either*:
 - a. 50 cm; *or*
 - b. 30 to 50 cm, and this thickness equals at least half the total thickness of the named diagnostic horizons that are preserved in the sequence of buried genetic soil horizons.
- A surface mantle of new soil material that does not meet the minimum thickness for buried soils can be used to establish a phase of the mantled soil or even another soil series if the mantle affects the use of the soil.
- **AGREED**

Proposal 2: Modifying the definition of an Anthropogenic Epipedon

- Anthropogenic epipedons form in human-altered or human-transported material. They often occur on anthropogenic landforms and microfeatures or occur in human-transported materials above them. They may also occur in soils that have **long-term usage for agriculture.**
- **Long term usage?? Committee decided more clarification of this is needed**

Proposal 3: Modifying the characteristics of an Anthropogenic Epipedon

- The anthropogenic epipedon consists of mineral soil material that shows evidence of intentional alteration by human activity.
- **How much alteration is needed before considered intentional?**

Change the definition (item 7) of the mollic (and umbric) epipedons

- The mollic epipedon consists of mineral soil materials not human-altered or human-transported material (defined below) and,”
- 7. Does not contain **any** of the following:
- a. Artifacts (more than incidental debris or trash) in some part; *or*
- b. Evidence of being modified such that human-applied organic amendments (e.g., surface applications of bone for raising P levels, or char and charcoal produced by pyrolysis added to enhance fertility or water-holding capacity) profoundly altered the physical and chemical properties; *or*
- **Any? That word is too restrictive**
- **Another concern: Need to quantify. Consider the biochar created by ethanol production being added in small amounts to Mollisols, does this alter the classification?**

Defining Human Altered Material

- Human-altered material is parent material for organic or mineral soil materials that have either been deeply-mixed in-place, excavated from a pedon and replaced by directed human activity, or truncated by removal of the surface soil or more. These soils may have a surface deposit of human-transported material (defined below).
- Many intentionally-leveled human-altered soils occur in **irrigated fields (?)**. Because the soil may have been mixed deeper than all diagnostic horizons.....
- **OUR CONCERN: Too inclusive, refine the definition. Concern with irrigated and terraced fields in Midwest and Great Plains would meet this definition. Could open up a new realm in Series definitions, splitting existing series based on land use. Are we prepared for that???**

Required Char. Of Human Altered Material

- Has an abrupt lateral discontinuity of horizons and layers at the edge of a farming **terrace** or field (e.g., no continuous diagnostic surface or subsurface horizons extend across the boundary edge of the field at similar depths below the current surface); *or*
- **CONCERN: If kept will require updates of classification and interpretations of map units—with all of the terraces in our region**

Human Transported Material-Required Characteristics

- b. Has an irregular distribution pattern with depth (unexplained by natural parent material formation or **transportation** processes alone) of *one or more* of the following:
 - (1) Organic-carbon content (Holocene age); *or*
 - (2) Airborne combustion byproducts (e.g., fly ash); *or*
 - (3) Combustion or manufacturing by-products (e.g., particulate charcoal or organic ash produced by pyrolysis, coal ash, bottom ash, slag, etc.); *or*
 - (4) Refined or raw hydrocarbons (e.g., buried refined or crude oil spills) not associated with a recorded spill at the site; *or*
 - (5) **Radioactive fallout?**; *or*
 - (6) Aerosols and particulates manufactured, released, or produced by manufacturing; *or*
 - (7) Minerals or rock fragments that are rapidly weatherable in the current effective soil property and soil climatic setting; *or*
 - (8) Heavy metals (e.g., Pb) associated with human mining or manufacturing activity, feeding, application, pollution, dumping, or biosolid or manure-spreading; *or*
- **Committees Thoughts: Include erosion. Maybe consider deleting all of airborne materials. Are the items listed relevant/important for Taxonomy?**

Modify Surface Mantle of New Material

- **Surface Mantle of New Soil Material**
- A surface mantle of **new** soil material, is largely unaltered, at least in the lower part. A surface mantle of new soil material displays the following properties:
- A diagnostic surface horizon (epipedon) *or* no diagnostic surface horizon; *and*
- 2. diagnostic subsurface horizons other than a cambic horizon; *and*,
- Unclear meaning of **new**. Liked existing paragraph in chapter 1 better. This wording would allow a Mollisol or Inceptisol to be considered new.

Delete the Key to Arents And the Key to Great Groups of Arents

These deleted groups of Udarents and Ustarents will go through into their respective “Anthroportic Udorthents” and “Anthroportic Ustorthents” and fall out between Oxyaquic and Durinodic subgroups in Ustorthents and between the Oxyaquic and Vermic subgroups in Udorthents.

We thought this was a good idea to bring this classification down the “food chain”

Move Anthrepts from Suborder to Subgroup

- We agreed this was a good idea as well.
- This is less restrictive and gives us more flexibility when classified at a lower level. It will give the opportunity of more easily defining family class.

Proposal: Add Human-altered and Human-transported Material Classes

- Good idea but are all of these classes necessary. Can some be combined, etc.?
- **Methanogenic**--Detectible evolution of methane from the decomposition of nonpersistent artifacts, such as garbage or other buried waste products, and which is easily detectable by its odor or readily observed by the collection and/or burning of methane gas .
- **If this remains then need to add a family class for very wet soils meeting hydric soils indicator A4 to maintain consistency in Soil Taxonomy.**

Some other classes

- **Subsidic**--More than 35 percent (by volume) artifacts that are likely to decompose and cause subsidence in the soil within a realm of one hundred years from the time of burial under the current or projected effective soil climate conditions and that have diameters of 2.0 mm or more *and* at least an extremely weakly cemented rupture-resistance class .
- **Tries to define a transient material. Is this needed? Climatic impacts? Uncertainty, is this more an interpretation separation as opposed to a taxonomic issue? Recommend putting into Spoliwastic**

Others

- Spoliwastic (garbage from landfills)
- Asphaltic, Concretic, Gypsifactic, Ashifactic, Aquadensic, Anthrodensic, Multiartifactic, Araric, Hypodensic
- Combustic (**how do we keep scoria from this material class?**)
- Pauciartifactic-More than 10 percent (by volume) innocuous artifacts that have diameters of 2.0 mm or more *and* at least an extremely weakly cemented rupture-resistance class . (**Is this material class needed?**)

Fluvaquents (and Fluvents)

Add an exclusionary statement to Fluvaquents to prevent human-transported soils from being classified as Fluvaquents. These soils would then fall into Epiaquents and Endoaquents (for Fluvents, it would be Orthents)

--We felt this was good idea

Replace mineral soil surface with first mineral soil horizon

- We agreed with this change because the definition for mineral soil in the Keys includes mineral soils with organic horizons.

Many Thank You's To:

- Doug Malo
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- Cameron Loerch

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