

**Answers to Questions Posed in ICOMANTH
Circular Letter No. 4 released January 31, 2003**

Q1. Is the highest division of artifacts into degradable and recalcitrant in section I the most logical, objective, and feasible for field surveyors?

A1. Yes. (SB)

I am not sure about the degradable or recalcitrant classes. It is a departure from convention. We now classify based on size and rupture resistance. Perhaps degradable or recalcitrant are more like mineralogy classes. (BE)

The definitions given for the Component terms make it feasible for field surveyors, even though slightly subjective. (JDH)

Yes. You've considered the issue of differing amounts of time might be required to degrade different materials. (UNK)

Yes, it is. Degradable and recalcitrant artifacts are more discernible for field surveyors than organic versus inorganic artifacts. We have to keep in mind that the nature of a particular environment in terms of humidity, temperature and soil reaction is clearly described at the Family level of soil classification, and in many cases, the humidity or temperature at the levels above it. So, the rate of degradation of any artifact may be inferred from the soil classification of a particular pedon. (EGE)

Q2. Would an alternative division at the highest level of organic versus inorganic artifacts be more logical, objective, and feasible for field surveyors? If so, how would you define organic artifacts? Please keep in mind that plastics are made from hydrocarbons and may be considered organic.

A2. No. N/A. (SB)

I think a division at the highest level of organic versus inorganic artifacts might be better. We do not have a good place for tires and plastic in the proposal. They are not really rock fragments as defined now in ST. My first thought would be root restrictive fragments of (manufactured) organic materials. I am not sure we need to limit it to manufactured. I think wood could be in this class. (BE)

No, it would not. It may become cumbersome to try to separate organic versus inorganic artifacts. Not only plastics may be considered organic, but asphalt and other hydrocarbons artifacts. There are also many look alike organic artifacts that are in fact inorganic and visa versa.

It might take more time to figure out the organic or inorganic nature of an artifact than its degradability. (EGE)

High amounts of organic materials that may degrade at faster rate and affect use than other organic materials (plastics=possibly longer degradation time) would then have the field surveyor to make decisions he/she may not have enough experience in. The description of such at the highest level would be no problem with a good definition. This will also apply to the degradable question if/when more sublevels are introduced in the future of Anthropogenic Classification. (JDH)

Should the proposal further divide organic into “natural” and “synthetic”? (UNK)

Q3. Would an alternative division at the highest level of innocuous versus noxious artifacts be most logical, objective, and feasible for field surveyors? If so, how would you define innocuous artifacts? Should this separation be made by soil scientists? Please keep in mind that length of exposure, type of exposure, age and type of organism exposed, and quantity of material exposed to have a bearing on the health danger involved.

A3. No. N/A. The soil scientist should be able to make the proper separation. In addition, appropriate or specialized training should be provided in order to ensure accurate identification. The specialized training should include the utilization of preventive measures to protect and minimize the risk to the quality of health and life. (SB)

I think this is equivalent to mineralogy classes and should be handled at that level. (BE)

Safety. If there is a known noxious substance in the soil profile/area, I would not want my people describing any of it. Hazmat teams should describe it. (JDH)

No. (UNK)

Section I

I feel the term “nondegradable” would be better accepted and understood by our field soil scientists than the term “recalcitrant”. For me it is a more easily understood term and is consistent with the other type of artifacts that have already been called “degradable”.

Our mine and leveled soils consists of natural soil and rock materials that have been moved. These materials are “artifact” free (<2%--puric). Our current system of morphology (horizonation, texture, texture modifier, percent fragments, etc.) for describing and classifying soils works very well for these materials. The only deficiency in the system, for these materials, is that we do not have a “horizon suffix” that flags that horizon as having once been moved. We have no problem horizonating these soils with A, B, or C master horizons depending on how much development has taken place since they were deposited. If a suffix existed for “natural soil

materials that have been mechanically moved by machinery” we would add that to the A, B, or C master horizon. Maybe a proposed “hh” or “mm” suffix would work here. I am strongly opposed to using the proposed master symbol “H” for these types of materials because they will develop, respond, and interpret pretty much the same as “unmoved” natural materials with similar physical and chemical properties. For this same reason, we should not lump these artifact free materials in with materials that contain artifacts as the Circular #4 proposed definition for “Spolic” materials now reads. To keep these artifact free HTM (human transported materials) separate from those with significant artifacts I would strongly suggest the definition for Spolic materials be revised as follows:

Spolic materials - (proposed by John Sencindiver, Steve Park. From Latin *spoliare*, earth and rock waste materials) are mixtures of natural inorganic and/or organic materials such as soil, regolith, and rock transported and deposited on the landscape or in pits through human activity such as mining, quarrying, road construction, cut/fill, leveling, and other earth excavations. These materials have less than 2% artifacts. The redistribution of material is of such extent that original soil horization and geologic stratification may have been destroyed or are unrecognizable in the altered layers. In older materials some of the original soil horization may have reformed and is easily recognizable. Spolic materials occur on anthropogenic landforms and lie unconformably upon the soil or regolith material that was not transported by humans. They may also occupy recontoured landforms that closely match the original landform and contours. Spolic materials associated with mining may qualify as sulfidic materials. *(The proposed master horizon “H” would not be used for these materials. If a horizon suffix existed to indicate that these materials have been moved (hh or mm) then it would be used with master horizons A, B, or C. The suffix would not be used for master horizon H. The current standards to describe and classify soils would be used for these materials.)*

With the revision to the Spolic materials definition we now need to account for those HTMs that have 2% or greater artifacts but do not qualify as Garbic, Dredgic, or the revised Spolic materials. Urbic materials would seem to be the logical choice for this group. In fact, myself, and others, were confused why this was not a defined material in the first place. Urbic materials would be defined as follows:

Urbic materials – (proposed by Delvin Fanning, Steve Park. From Latin *urbanus*, of, relating to, characteristic of, or constituting a city and Middle English waste, from Latin *vastus*, damaged, defective, or superfluous material produced by a manufacturing process). These materials have 2% or greater artifacts, less than 35% garbic artifacts, and up to 100% urbic artifacts. This includes materials used commonly in association with human living, construction, and activity. It includes largely inorganic material such as iron ore slag, metal objects, chemicals, and human manufactured material such as fiberglass, brick, cinder block, concrete, metals and alloys, and other building debris. Also included are manufactured or altered materials derived from hydrocarbons such as coal ash, asphalt, synthetic fabrics, and plastics. Organic types include organic compounds and chemicals, human processed natural materials such as cotton and wool clothing, and lumber products. These are materials deposited in landfills or buried in landform construction and include materials that do not degrade within a few hundred years and do not pose a danger of subsidence or methane gas production.

With the revised Spolic and the new Urbic materials we can keep separate HTMs that are artifact free from materials with artifacts. This would give us four different HTMs (Spolic, Garbic, Urbic, and Dredgic) that I feel would meet our needs.

In the list of properties for Spolic, Dredgic and Garbic materials there were a number of properties listed that are also properties of natural soils that are not HTMs. Many of our colluvial soils have the same properties listed. The properties in questions are:

- Easily weatherable minerals or rock fragments, or masses of soft, secondary minerals that have abrupt contact edges with dissimilar soil material
- Easily weathered masses of soft, secondary minerals rock fragments that occur in common or greater abundance in near-surface horizons
- Bridging voids between rock fragments (*the term bridging voids is confusing; if rock frags are bridged then there are no voids; voids between rock frags are common in our fragmental materials*)
- Randomly oriented rock fragments
- Random lithochromic mottling
- Masses of contrasting parent materials in the same horizon or layer that have differences in texture, and/or type and percent of rock fragments
- Dark colored (value and chroma 3 or less), high carbon rock fragments such as coal or carbonaceous shale

It is the type and quantity of the artifacts that define the type of material. For Garbic, Urbic, and Dredgic materials it is so obvious what type of material it is that listing such properties above is confusing and irreverent. Some of the properties above may be appropriate for the revised Spolic materials. However, it is overwhelmingly the local knowledge of the area that tells the field scientists if he is in Spolic materials. For some old reclaimed areas it is often difficult to map the undisturbed natural soils from the HTM areas. I would suggest that the properties above be removed.

(SP)

Section I.

I have a fundamental difference with the definitions of human transported materials. When I think of anthropogenic soils I envision 2 main categories:

1. “Native soils” that have been scraped up, transported, and redeposited. Examples would be road fill or mine reclamation. Except for the mixing, they maintain many characteristics of the native soils (lithology of rock fragments, soil chemistry, color).
2. The other category is composed of non-native (human created) materials that have become refuse – the material in dumps and landfills that contain the various artifacts.

The way the human transported materials (HTM) are now defined, the above 2 categories cannot be differentiated. The definition of spolic materials (which seems to be the closest fit to category 1 above) allows up to 35% garbage (garbic materials) and up to 100% construction debris and trash (urbic materials). This blurs the line between native soil materials and human refuse. I

believe there is a need for a class of materials to include native soil materials that contain very few (if any) artifacts. I don't believe there is a need for both the garbic and spolic classes – they are too similar because they each allow a significant amount of human refuse. (TH)

Q4. Are the horizon and layer designations in section II logical, objective, and feasible for field surveyors?

A4. The horizon and layer designations are appropriate. In addition, the range for the *puric* phase is reasonable based on the inherent definition. (SB)

I think the “M” is not needed. Hm follows convention. (BE)

Yes. (JDH)

Yes. (UNK)

Note: Horizon designation is in section III.

Yes, horizon and layer designations in section III is logical, objective, and feasible for field surveyors. Both master letters "H" and "M" are easily understood. The proposed alternative symbols by Dr. Stan Buol better identify the urbic "u" and garbic "@" material contents. The "^" symbol might get confused with the ">" or "<" symbols, which express quantity. (EGE)

Q5. Can you suggest alternative section II designations that are more logical, objective, and feasible for field surveyors?

A5. No (SB)

I think the “organic-inorganic” split and the root limiting-nonlimiting may be better. The inorganic root limiting may fit the rock fragment and parafragment definitions. The “inorganic not root limiting” materials should fit a particle-size class. (BE)

No. (UNK)

The alternative horizon designations in section III seems to be logical, objective and feasible for field surveyors. (EGE)

Section II

When pararocks were introduced to the NSSH it created a lot of confusion, discussion, and debate on how to determine textural modifiers when there is a mixture of pararock and rock fragments. If the revised definition of Spolic materials is accepted then the current standards for determining textural modifiers work fine for Spolic materials. The less than 2% artifacts in Spolic materials would be described but

would not be used to determine the textural modifier. Artifacts must not be forced fit into the current fragment and texture modifier standards. The current standards must not be altered or compromised for artifacts. HTMs with greater than 2% artifacts must have their own system and criteria for determining textural modifiers. A brick is a brick and must not be considered the same as a gravel or cobble. I am strongly opposed to any further convulsion of the current fragment and textural modifier standards for natural fragments. Given my stance I would like to propose the following criteria for determining textural modifiers for HTMs with greater than 2% artifacts.

The texture modifier section of Circular #4 is not very clear. It would appear that the texture modifier name for H horizons consists of two parts. The first part is the natural fragment texture modifier which follows the same criteria we currently use for textural modifier for natural soils (see pages 2-30 and 2-31 of the *Field Book for Describing and Sampling Soils*). The second part is the artifact modifier which has similar percentages breaks to fragment breaks. I see no meaningful reason to have the same breaks for artifacts as we currently have for natural fragments. I don't feel we need that same amount of detail for artifacts. Therefore, I would propose the artifact breaks to be 2-35, 35-90, and >90%. As I stated before I am opposed to saying a gravel sized piece of concrete is the same as a gravel. One is an artifact and one is a natural fragment. They should be kept separate even if they have the same interpretative properties. Following is a table that I propose be used for determining texture modifier names for H horizons.

Texture Modifiers for H horizons (garbic, urbic, dredgic materials only)

FIRST PART*		SECOND PART		
% total volume of natural fragments	Fragment Modifier	% total volume for artifacts	Dominant Artifact	
<15%	None Used		Degradable**	Nondegradable
15 to < 35%	Use adjective for appropriate size; e.g., <i>gravelly</i>	2 to <35%	garbic	urbic
35 to <60%	Use "very" with the appropriate size adjective; e.g., <i>very gravelly</i>	35 to <90%	very garbic	very urbic
60 to <90%	Use "extremely" with the appropriate size adjective; e.g., <i>extremely gravelly</i>	>=90%	no modifier used; use a new proposed "terms in lieu of texture" called "garbic material"	no modifier used; use a new proposed "terms in lieu of texture" called "urbic material"

*See part 618.27 in the NSSH for additional guidance.

**Garbic artifacts have precedence when there are equal amounts of garbic and urbic artifacts.

Example 1—sandy loam with 10% gravel, 25% cobble, 5% stones, 20% garbic artifacts, and 30% urbic artifacts (concrete and brick pieces) → very cobbly very urbic sandy loam.

Example 2—loam with 5% gravel, 5% garbic artifacts, and 5% urbic artifacts (concrete and brick pieces) → garbic loam.

Example 3—loam with 5% gravel, 5% garbic artifacts, and 15% urbic artifacts (concrete, asphalt and brick pieces) → urbic loam.

Example 4—clay loam with 20% gravel, 35% garbic artifacts, and 5% urbic artifacts (concrete and brick pieces)→gravelly very garbic clay loam.

Example 5—2% gravel, 55% garbic artifacts, and 35% urbic artifacts (concrete and brick pieces)→garbic material

I am opposed to trying to make the existing family particle size classes work for HTMs with artifacts (with the exception of the revised Spolic materials with <2% artifacts). I strongly suggest we develop a set of family particle size classes for HTMs with artifacts. I would much prefer a “loamy-urbic” be used for landfill soils than “loamy-skeletal”. We created a whole new set of classes for the volcanic (andic) soils. We need to do the same for HTMs.

(SP)

Section II

I do not believe there is a need for 6 classes of textural modifiers for artifacts. I think this is an example of incorrectly assuming that what is meaningful for natural soils is meaningful for anthropogenic soils; the number of classes, class limits, and adjective terms do not need to be consistent. Would anyone actually care if a soil is very urbic (at 50% artifacts) or extremely urbic (at 70%)? To me, the only significant connotation made from the modifier is (1)does it contain a significant amount of artifacts, and (2)dominantly what type are they? One volume class of modifier (or at most 2) should suffice. For example 2-35% - urbic and >35% very urbic should provide all the detail necessary. This is particularly true when used in conjunction with a standard rock fragment modifiers. The proper place for more detailed information is in the horizon description (actual content of artifacts). (TH)

Q6. Are the terms for describing artifact content and kind in section III logical, objective, and feasible for field surveyors?

A6. Yes. However, contemporary mine soils not inclusive of garbic and urbic artifacts (profiles 4 and 5) should maintain existing horizon nomenclature presently used in all deeply-mixed horizons in the Arent and Orthent suborders. (SB)

They may be a little complex. (BE)

YES, for the field surveyor. (JDH)

Yes. (in Section II?) (UNK)

Yes, the terms clearly describe artifact content and kind. I would propose that either a symbol or a suffix be used for a horizon or layer containing noxious artifacts of any kind and content. The symbol ";", which is also a standard keyboard symbol, may be used for this purpose. This symbol commonly expresses surprise, caution or attention. (EGE)

Q7. Can you suggest alternative section III Description terms that are more logical, objective, and feasible for field surveyors?

A7. No. However, contemporary mine soils not inclusive of garbic artifacts (profiles 4 and 5) should maintain existing description terms presently used in all deeply-mixed horizons in the Arent and Orthent suborders. (SB)

I would not use “C” with “H”. I do not think we need the “M”. (BE)

No. (UNK)

The only suggestion I have is the use of a symbol or suffix for horizon or layer containing noxious artifacts of any kind and content (see item 6, above) (EGE)

Section III

I propose that the “H” horizon only be used for garbic, urbic, and dredgic material. It should not be used for Spolic materials with less than 2% artifacts. A horizon suffix “hh” or “mm” would be used with the master horizon A, B, or C to indicate artifact free materials that have been moved. Therefore, the “H” horizon would not be used for profiles 1, 2, 4, and 5 listed in Circular #4.

I support the use of a master “M” horizon for continuous physically root-limiting artificial layers. I do not support the use of the suffix “m” with the master horizon “M”. The suffix “m” has always been used, and should continue to be used, only for layers that have undergone pedogenesis and chemical cementation. A layer of asphalt does not qualify for the use of the suffix “m”. It is a restrictive layer and should be documented as such.

I do not support, and am strongly opposed, to the use of + and ^ symbols, as proposed by Stan Buol. The texture modifier and the description of the artifacts in the layer are sufficient. Adding the symbols to the horizonation is needless and confusing.

I am not sure I agree with not using an Arabic numeral (lithologic discontinuity) for a HTM overlying a natural layer. I think they should be used when an HTM overlies a natural layer. I also think they should be used between significantly different HTMs. A Spolic material with less than 2% artifacts over urbic material is significant with each part undergoing different pedogenesis. (SP)

Section III

I see 2 main categories of anthropogenic soils (explained above), and each is sufficiently different to warrant different horizon symbol conventions.

The human transported native soil materials can easily be accommodated by our present symbols: C horizons work fine for fresh deposits of HTM, and our other symbols are also applicable as natural horizons form in this material. At most, a suffix symbol may be needed to denote the HTM (such as “hh”). This distinction would be especially important where both natural and HTM C horizons are in a single pedon.

The artifact material should be given the proposed H master horizon symbol. This would reinforce the concept that such material is significantly different than the re-deposited natural soil material. The H would essentially denote material containing human refuse. Thus soils in dumps and trashy fill areas would be horizonated differently than soils in mine reclamation lands.

I think this basic differentiation of materials will make it easier to revise Soil Taxonomy for anthropogenic soils. The native soil HTM can be accommodated by our current family classes for particle-size and mineralogy. New classes are probably needed to comprise the human refuse HTM. For example creating a particle size class named “garbic” would be much better than force-fitting such a soil into the loamy-skeletal class. (TH)

Q8. Are there other pieces of evidence that can be used to distinguish human-transported materials?

A8. N/A (SB)

Geomorphically, yes. Parking lot dividers, sound mounds between roads and houses, House pads, general landscaping, etc. Topographically, sometimes straight angular topo lines are an indicator that earth has previously been moved in that area. Anthropogenic krotovinas “storm drain pipe, electric line cuts, sewer and water lines.” (JDH)

Yes, there is. In Paraguay, termite mounds are usually taken away from the field with the aid of machinery and deposited on the sides where they are shattered and sometimes incorporated into the soil by plow or heavy disks. Pieces of these mounds remain in the soil for long periods of time and negatively affect plant growth, especially crop plants. Animal habitats, like termite mounds that were removed from their original places by human activity, might be considered human transported materials. (EGE)

Q9. Should there be an upper limit on content of artifacts? For example, what texture would you call a horizon with 95% concrete rubble, twisted steel, and bricks?

A9. Yes (SB)

I think this could be a “fragmental” particle-size class. I think we will need another class for root limiting organic fragments. The equivalent of a mineralogy class could be developed to separate toxic materials as well as rapidly weatherable materials. (BE)

Yes. Probably non-soil. Looks like this wouldn’t meet the definition of “soil” in either *Soil Taxonomy* or *Soil Survey Manual*. (UNK)

Texture is not usually given to a paralithic horizon, and even though this horizon of 95% Man made fragments probably doesn’t meet taxonomical requirements for a Cr, it should be described without a dominant texture because it would be limiting. (at least to a shovel or auger.) What should be the upper limit? 75% is my best stab at it. Estimations will probably vary so great throughout the horizon and the size of fragments, along with the remaining “soil”. (JDH)

No, to set an upper limit on content of artifacts above 60% may not be realistic. We may use the phase criteria for rock fragments (Van Wambeke A. and T.R. Forbes, Guidelines for Using Soil

Taxonomy in the Names of Soil Map Units. SMSS Technical Monograph N° 10) on page 36: "if enough fine earth is present to determine the texture class (approximately 5 percent or more by volume) the adjective term of the dominant kind of rock fragment is used with the word "extremely" as a modifier of the textural term: extremely gravelly loam. If there is too little fine earth to determine the texture class (less than about 5 percent by volume) the term "gravel", "cobbles", "stones", and "boulders" are used in the place of fine earth texture". On this basis, we can use "extremely urbic" as the modifier of the textural name when there is enough fine earth to determine the texture class and "urbic materials" when there is not enough fine earth to determine the texture class. (EGE)

Q10. Do you have other comments and suggestions for the proposals in this letter?

A10. Yes. Although Arent and Orthent suborders associated with surface coal (lignite) mining activities are technically recognized as Anthropogenic soils, they should not be included in Spolic materials as part of this proposal.

Responsive Reasons:

- **Human Transported Materials** (HTM or Anthropogenic soils) – any material (artifacts, soil, rock, or sediment) moved horizontally from a source area outside of the pedon by direct intent human activity, usually with the aid of machinery. This excludes vertical mixing with the pedon. The resulting transportation or deposition results in the creation of an *anthropogenic-altered landform*.
- The **HTM** definition is a broad definition for Anthropogenic soils.
- There are mine soils that are man influenced by machinery that do not contain garbic or urbic materials (artifacts) inclusive of surface coal (lignite) and uranium mining spoil areas (reclaimed or non-reclaimed) that should not be included in the *Spolic materials* category. Currently, the Arents and Orthents suborders properly classify mine soils and places them in subgroup and great group categories that meet land user needs.

Although two or more properties listed for identifying spolic and garbic materials are inherently related to extensive earth moving activities associated with mining operations, again the criteria should not be used to potentially include the criteria of the suborders Arents or Orthents into the proposed Spolic subgroup.

Arents are defined as soils that do not have horizons because they have been deeply mixed by plowing, spading, or other methods of moving by humans (machinery). The soil retains fragments that can be identified as parts of a former spodic or argillic horizon, a duripan, and so on, but the fragments do not themselves form horizons. Rather, they are scattered through the soils and are mixed with the materials of other horizons. (There are no Typic subgroups.)

In addition, Arents have 3 percent or more, by volume, fragments of diagnostic horizons in one or more subhorizons at a depth between 25 and 100 cm below the soil surface, and the fragments are not arranged in a discernible order and, and do not have within 50 cm of the mineral soil surface, aquic conditions; and colors defined for Aquents or Sulfidic materials or A positive reaction to alpha, alpha-dipyridyl when the soil is not being irrigated.

Orthents are on recent erosional surfaces due to geologic or induced by cultivation, mining, or other factors. Any former soil that was on the landscape has been completely removed or so truncated that the diagnostic horizons for all other orders do not occur. (There are no Typic subgroups.)

In addition, Orthents do not have fragments of diagnostic horizons that can be identified and that occur more or less without discernible order below any Ap horizon but above a depth of 100 cm or above a densic, lithic, or paralithic contact that is shallower than 100 cm.

- A significant number of the comprehensive mine soil pedon descriptions identify 3 percent or more by volume recognizable fragments of diagnostic soil horizons that are not arranged in any discernible order and are placed in the Arents suborder.
- A significant number of comprehensive soil pedon descriptions identify less than 3 percent by volume recognizable fragments of diagnostic soil horizons that are not arranged in any discernible order are placed in the Orthents suborder.
- Materials associated with surface coal (lignite) mining consist of a selective redistributed mixture of fragments (includes oxidized materials) of diagnostic horizons and geologic materials.
- In addition, the reclaimed selective mixture of diagnostic horizons and geologic materials are used to restore mined land to a postmine prime farmland status when recognized through NCSS correlation activities and released by a regulatory authority for agricultural production.

Recommendation

It is recommended that the proposed Spolic subgroup or other subgroup classifications be included in a separate Anthropogenic suborder hierarchy below Arents and Orthents?

Additional Questions

- What is the logical, objective, and feasible reason or reasons for the less than 3 percent by volume recognizable fragments of diagnostic soil horizons criteria as used in the garbic, spolic, urbic, and dredgic subgroup proposals?
- Is there a placement within the proposed classification system to facilitate soils that have 3 percent or more by volume recognizable fragments of diagnostic soil horizons?

- Will the proposed subgroups be placed in an Anthropogenic suborder hierarchy below Arents and Orthents?

(SB)

Interpretations of the divisions of Anthropogenic soils should be thought of while the creation of them is being completed. For the description of the site/pedon, the classification, designations, and terms proposed are very good; however, the questions ask about the feasibility for field surveyors. Keep in mind that when mapping Urban soils there are other considerations involved. The most important are **what interpretations will this map unit produce?** I realize that ICOMANTH's Plan of Action states "ICOMANTH will not lead the development of the interpretations themselves"; however, degradable artifacts definition of time scale may need to be considered differently depending on the urban use of that site. For example, if say 20 tree stumps are buried in a well drained soil in a humid climate and a building is constructed on that site, in approximately 30 years, there could be structural problems. This is contrasted by asphalt that may degrade in a "few centuries". "Definitions of materials and new horizon designations will allow urban soil surveys the tools they need to set up new series and speed correlation of surveys in progress." Are soil series to be separated by ranges of degradation times (i.e. 1 to 30 years, 30 to 100 years, 100 year to a few centuries)? If so, will definitions or criteria for field surveyors who will not be around for that long, and do not have experience with half lives of asphalt or biodegradable plastics, be created?

I would like to commend the committee on the horizon designations that are proposed. These would be extremely useful for the Urban field soil scientist. I realize that this is an international committee; however, I would like to bring up NRCS's National Soils Information System (NASIS). These horizon designations will need to be included in the Pedon Horizons table, along with restrictions, fragments, designation suffix's, etc.

Infiltration and runoff of spolic materials is significantly decreased in most cases because of the destruction of natural drainage structure. Has research been done on these for those interps to be produced? Once I have explained this to a lay person, the question is ALWAYS "How long before it returns to a natural state?" Not in our life time.

(JDH)

What noxious materials are solids? Cow patties, glass shards, and plutonium nuggets? I think of noxious materials as mostly liquids or gases. (UNK)

I have two suggestions:

The first one is mentioned in item 6 above. In Paraguay, there are some few places where pesticides containers were discarded after use, usually on a "dump area" on the farmer's field or an area nearby that gathered several farms. On field surveys, we were always worried on how to represent this kind of danger on soil description and mapping.

The second suggestion is to include termite mounds and other kind of animal habitats as human transported materials, when they are removed from their original places and deposited on soils.

(EGE)

Here in MO6 the bulk of the acreage of our “anthropogenic” soils is mine soils and soils that have been cut and filled (leveled). These soils are “artifact” free. To a lesser extent we have the urban/landfill type soils associated with the large urban areas along the Front Range of Colorado. Of course these areas are full of artifacts.

Let me express some general comments I agree we need to make some changes to help us better describe anthropogenic soils, particularly those filled with artifacts. To what degree we take these changes is the big question. I feel that by trying to force some of these proposed anthropogenic definitions and criteria into our current system will make it too complicated to use by most of our users. We need to keep this to the simplest level. (SP)

General Comments

My initial reaction to the criteria and definitions in this circular is that it is excessively detailed. I cannot imagine that any interpretations we would generate for anthropogenic soils would require this degree of detail and such specific descriptions. I believe every attempt should be made to develop different criteria for classification and nomenclature for anthropogenic soils and natural soils. That is, we do not need to force anthropogenic descriptions into our current description elements and categories for natural soils. “Don’t pollute our good system with garbage.”
(TH)

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