

Interpretations Criteria Committee
Team Report and Recommendations
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USDA-NRCS National Soil Survey Center
100 Centennial Mall N #152
Lincoln, Nebraska 68508-3866
c/o Joyce.scheyer@nssc.nrcs.usda.gov

What are “criteria” for soil interpretations?

- Criteria form the mechanism for evaluating a set of measured or estimated soil properties according to the needs of the user for specific management of the land. Soil interpretations are an integral part of soil surveys and a necessary bridge between those who make the maps and those who use the land.
- The soil interpretations and the maps are based on a common set of definitive soil properties for each soil map unit component on the landscape. The soil survey interpretations evaluate the soil data according to criteria that are scientifically shown to relate the levels of the soil properties to the degree of success (or failure) of a chosen land use.

Why this committee was formed - the problem.

- A major problem with existing soil interpretations appears to be a mismatch between the known soil data and related soil characteristics in a given location and the predictions of soil behavior from the generalized guidelines.
- This is to be expected in part given the diversity of landscapes and soils in the USA and the wide ranges in soil properties within some soil components.

Why this committee was formed - the objective.

- On the other hand, national and regional guidelines are not useful at the field level if the predictions are inaccurate and misleading to the customer.
- The objective of this project was to find a better way to combine national scientific guidance with locally-tailored predictions of soil behavior to update soil survey interpretations.

Introduction

Two paths are useful for reviewing and updating criteria for soil survey interpretations:

- 1) testing thresholds for individual soil properties embodied in the interpretations, or
- 2) testing the resulting ratings that are based on hierarchical evaluation of a set of soil properties for a specific future use.

Introduction

To ask whether we need national criteria leaves open the possibility of locally adapted interpretation ratings where the hierarchy, the choice of soil properties, and even the specific land-use may vary.

Likewise to ask whether we need national interpretations leaves open the possibility of a standardized set of soil properties for a selected land-use but with different thresholds based on local regulations or regional variability.

Summary of Process for Reviewing Criteria

Points to review for each interpretation:

- List influential soil properties and the ranges used in evaluations currently in NASIS.
- Assume that the science behind the choice of properties and ranges is still valid.
- Determine which soil properties are no longer needed in the interpretation and which need to be added (see local interpretations for variations in the properties)

Summary of Process for Reviewing Criteria

Points to review for each interpretation:

- Compare national "template" for interpretation to examples of locally tailored interpretations (i.e. seepage based on permeability at a certain depth for drainlines). Flag the documentation where local specifications or regulations differ most often.
- Search for "new" criteria. Newer or better criteria may already be identified for specific uses.

Summary of Process for Reviewing Criteria

Points to review for each interpretation:

- Is the goal for states to borrow and adapt from each other's locally tailored interpretations rather than from a national template? Are national templates still needed for new interpretations to provide a starting set of soil properties and ranges for states to tailor? Do we need a standard naming system so that states can find each other's tailored interpretations on the same subject?
- Assess the problems or questionable areas of the whole interpretation criteria process

Septic tank absorption fields (620-30 NSSH 2001)

Septic tank absorption fields are subsurface systems of tile or perforated pipe that distribute effluent from a septic tank into the natural soil.

The centerline depth of the tile is assumed to be 60 cm (2 feet). Only the soil between depths of 60 to 150 cm (2 to 5 feet) is considered in making the ratings.

The soil properties and site features considered are those that

Summary of Soil Properties in Criteria: Septic Tank Absorption Fields

Texture related

FRAGMENTS > 75MM WEIGHTED AVE. IN DEPTH 0 -100CM

*USDA TEXTURE IN-LIEU-OF "Permafrost"

*USDA TEXTURE MODIFIER "Frozen"

DEPTH TO PERMAFROST

* Crisp Rule (All or nothing). Others are Fuzzy Rules described by linear or nonlinear equations

Summary of Soil Properties in Criteria: Septic Tank Absorption Fields

Surface water related

*FLOODING FREQUENCY (Maximum Duration)

VERY RARE

RARE

OCCASIONAL

FREQUENT

VERY FREQUENT

*PONDING DURATION

*PONDING FREQUENCY

* Crisp Rule (All or nothing). Others are Fuzzy Rules described by linear or nonlinear equations

Summary of Soil Properties in Criteria: Septic Tank Absorption Fields

Subsurface water related (see significant changes made in 1999 in NASIS)

KSAT MAX TOP ABOVE RESTRICTIVE LAYER >60

KSAT MINIMUM ABOVE RESTRICTIVE LAYER >60

This property retrieves the minimum Ksat values for those layers between 60 and 150 cm. If these layers include bedrock or some other root restrictive layer that layer is included in the evaluation. This has caused some problems where states have not populated the Ksat data for these root restrictive layers.

Resolution as recommended by the state soil scientists: For poor filter criteria for NASIS ENG - Septic Tank Absorption Fields interpretation evaluate only the soil horizons above any root restrictive layer.

Summary of Soil Properties in Criteria: Septic Tank Absorption Fields

Restrictive layers

DEPTH TO BEDROCK

DEPTH TO CEMENTED PAN

Landscape related

SLOPE

*SUBSIDENCE TOTAL

HIGH WATER TABLE DEPTH MINIMUM

* Crisp Rule (All or nothing). Others are Fuzzy Rules described by linear or nonlinear equations

SUMMARY AND RECOMMENDATIONS

At this time soil survey interpretations do not address interactive effects of soil properties. The resulting ratings reflect the single soil property that dominates soil behavior for a selected land-use. The first soil property that is most suitable (or limiting) has the greatest influence on soil behavior and subsequent properties cannot mitigate the effect of the first.

Recommendation 1: Expand interpretation criteria to address interactive effects of soil properties.

Recommendation 2: Clarify the hierarchy of soil properties and the weight of each in the rating.

SUMMARY AND RECOMMENDATIONS

We need some nationwide rating systems for resource inventory that use standardized criteria and standardized interpretations for a specific set of soil behaviors. This national need remains central to NRCS programs and is not in conflict with the current question of national or locally tailored criteria, interpretations, and land-uses.

Recommendation 3: Develop a naming system to identify nationwide rating systems for resource inventory (with standardized criteria and standardized interpretations) as independent from local and regional criteria and interpretations for individual land-use decisions.

SUMMARY AND RECOMMENDATIONS

In the future there could be a wide variety of thresholds and weightings for each soil property together with many choices of which properties to group together for any number of land-use ratings. Future expansion of the criteria depends on a creative and visionary research program to provide local and regional models of systematic changes in soil behavior.

Recommendation 4: Establish and support a creative and visionary scientific research program to provide local and regional models of systematic changes in soil behavior.

Team Members (National Soil Survey Center)

Sponsor: Karl Hipple, National Leader for Interpretations

- Joyce Scheyer (Chair), Soil Scientist, Interpretations
- Jim Fortner, Soil Scientists - NASIS, Interpretations
- Dave Lightle, Conservation Agronomist, Interpretations
- Gary Muckel, Soil Scientist, Classification and Standards
- Johnny Patterson, Forester, Interpretations
- Susan Samson-Liebig, Soil Scientist, Investigations
- Lyle Steffen, Fluvial Geomorphologist, Interpretations