United States Department of Agriculture

Natural Resources Conservation Service

National Soil Survey Center

Miscellaneous Publication Number 1492

State Soil Geographic (STATSG0) Data Base

Data use information

For additional copies of this publication contact:
National Cartography and GIS Center
U.S. Department of Agriculture, Natural Resources Conservation Service
P.O. Box 6567
Fort Worth, Texas 76115–0567

Phone (817) 334–5559 FAX (817) 334–5469

Issued August 1991, Slightly revised May 1993, Revised December 1994.
Converted to *.PDF* September 1995

Contents

Contents continued

Figures

Examples

Tables

Introduction

The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS), formerly the Soil Conservation Service (SCS), leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining, and distributing soil survey information for privately owned lands in the United States.

Soil geographic data bases

The NRCS established three soil geographic data bases representing kinds of soil maps. The maps are produced from different intensities and scales of mapping. Each data base has a common link to an attribute data file for each map unit component. The Soil Interpretations Record data base provides the attribute data for each geographic data base.

The three soil geographic data bases are the **Soil Survey Geographic (SSURGO)** data base, the **State Soil Geographic (STATSGO)** data base, and the **National Soil Geographic (NATSGO)** data base. Components of map units in each data base are generally phases of soil series that enable the most precise interpretation. Interpretations are displayed differently for each geographic data base to be consistent with differing levels of detail. The Soil Interpretations Record data base contains physical and chemical soil properties for approximately 18,000 soil series recognized in the United States.

The SSURGO data base provides the most detailed level of information and was designed primarily for farm and ranch, landowner/user, township, county, or parish natural resource planning and management. Using the soil attributes, this data base serves as an excellent source for determining erodible areas and developing erosion control practices, reviewing site development proposals and land use potential, making land use assessments, and identifying potential wetlands and sand and gravel aquifer areas.

Using NCSS mapping standards, soil maps in the SSURGO data base are made using field methods. Surveyors observe soils along delineation boundaries and determine map unit composition by field traverses and transects. Aerial photographs are interpreted and used as the field map base. Maps are made at scales ranging from 1:12,000 to 1:63,360. Typically scales are 1:15,840, 1:20,000, or 1:24,000. The maps, along with comprehensive descriptions, produce an attribute and spatial data base for NCSS publications.

Line segments (vectors) are digitized in accordance with specifications and standards established by the NRCS for duplicating the original soil survey map. The mapping bases are normally orthophotoquads, and digitizing is performed by NRCS, by contractors, or by cooperating Federal, State, and local governments. Data for the SSURGO data base are collected and archived in 7.5 minute topographic quadrangle units and distributed as a complete coverage for a soil survey area usually consisting of 10 or more quadrangle units. The adjoining 7.5 minute units are matched within the survey areas.

The STATSGO data base was designed primarily for regional, multistate, river basin, State, and multicounty resource planning, management, and monitoring. STATSGO

data are not detailed enough to make interpretations at a county level.

Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps. Where more detailed soil survey maps are not available, data on geology, topography, vegetation, and climate are assembled, together with Land Remote Sensing Satellite (LANDSAT) images. Soils of like areas are studied, and the probable classification and extent of the soils are determined.

Map unit composition for a STATSGO map is determined by transecting or sampling areas on the more detailed maps and expanding the data statistically to characterize the whole map unit.

Using the United States Geological Survey's (USGS) 1:250,000 scale, 1- by 2-degree quadrangle series as a map base, the soil data are digitized by line segment (vector) method to comply with national guidelines and standards.

Data for the STATSGO data base are collected in 1- by 2-degree topographic quadrangle units and merged and distributed as statewide coverages. Features are edge matched between states. The map unit composition and the proportionate extent of the map unit components also match between states.

The NATSGO data base is used primarily for national and regional resource appraisal, planning, and monitoring. The boundaries of the major land resource areas (MLRA) and regions were used to form the NATSGO data base [6]. The MLRA boundaries were developed primarily from State general soil maps.

Map unit composition for NATSGO was determined by sampling done as part of the 1982 National Resources Inventory [7]. Sample data were expanded for the MLRA's, with sample design being statistically significant to State parts of the MLRA's.

The NATSGO map was compiled on an NRCS-adapted version of the 1970 Bureau of Census automated State and county map data base and it was digitized from the USGS 1:5,000,000 scale U.S. base map.

This document describes the STATSGO data, which provide national coverage at a scale of 1:250,000, except for Alaska, which is at a scale of 1:2,000,000.

Using soil maps

A soil map in a soil survey is a representation of soil patterns in a landscape. The scale of the map and the complexity of the soil patterns determine what can be shown on the soil map. In designing soil surveys, the projected uses of the survey and the complexity of the soil patterns largely determine the scale of the soil map [4].

When using soil maps, remember that scale, accuracy, and detail are not synonymous. Scale is the relationship between corresponding distance on a map and the actual distance on the ground. Accuracy is the degree or precision with which map information

is obtained, measured, and recorded, and detail is the amount of information shown.

Map scale, accuracy, and detail are interrelated. A large-scale map is not necessarily more accurate or more detailed than a small-scale map; however, it generally shows more detail than a small-scale map. Soil maps are made by using field investigation methods. The accuracy of the maps is determined by many factors, including the complexity of the soils, design of the soil map units, intensity of field observations and data collection, and skills of the mapper.

A soil map at 1:250,000 scale should not be used to locate soils for intensive land uses, such as determining suitability for house lots. It is useful for understanding the soil resources and for planning broad use in a State or region. A soil map at 1:20,000 scale is useful in understanding and planning the soil resources of fields, farms, and communities, but it is not useful for planning small (less than 1 acre) research plots. In many places the pattern of soils is very complex, and in some places soils grade imperceptibly to others. Because of this, soil delineations, even on large-scale maps, are not homogeneous or pure; thus, onsite investigations are needed to determine, for example, the suitability of a plot for a septic tank installation when using a soil map at scale of 1:20,000.

The common practice of enlarging soil maps does not result in more detailed or accurate maps. Soil survey maps enlarged to 1:12,000 scale from 1:20,000 scale are no more accurate or detailed than the original 1:20,000 map.

Many times the information on soil maps is transferred to other base maps at different scales, which diminishes the new map’s accuracy, especially if the base map is not planimetrically correct.

Soil interpretive maps for specific uses are commonly made from the soil maps. These kinds of maps are single purpose and have the same credibility and limitations as the soil maps from which they are made.

Recognizing the different kinds of soil maps, knowing their merits and limitations, and

Use of STATSGO data

STATSGO interpretive maps

understanding the relationship of map scale, accuracy, and detail are important.

In a detailed SSURGO soil map, each map unit is usually represented by a single soil component, typically a soil series phase [5]. Some SSURGO map units may have up to three named components. An interpretive map is normally made by classifying each unit according to the set of soil properties for a single component. In contrast, each map unit on a STATSGO map contains up to 21 components for which there are attribute data, but there is no visible distinction as to the location of these components within the delineation. Thus, to present information on an attribute, a series of maps must be used to portray the more complex set of available information.

The legend for STATSGO interpretive maps commonly shows the percentage of the map unit that meets a criterion or criteria. Caution must be used in evaluating the statistics presented in such a legend. Percentage ranges given represent all delineations in that class and do not represent an individual STATSGO delineation. Percentages do not statistically represent a subset of the delineation such as a county portion. They also do not represent the areas of the soil components that satisfy the criterion. However, the area of each map unit component is recorded in the data base and can be used to produce a table, even though the components cannot be displayed directly on the map.

Using STATSGO data with other data

When STATSGO data are overlayed with other data, such as land use data, caution must be used in generating statistics on the co-occurrence of the land use data with the soil data. The composition of the STATSGO map unit can be characterized independently for the land use and for the soil component, but there are no data on their joint occurrence at a more detailed level. Analysis of the overlayed data should be on a map polygon basis. It is incorrect to assign land use attributes to the soil components by multiplying the proportions of soil components by the proportions of land uses. Additional political, watershed, or other boundaries may be intersected with the soil data. Although the composition of each political and watershed unit may be described in terms of the STATSGO map units, information is not available to assign the components to the boundary units with full accuracy. As with the land use categories, the analysis should be restricted to the classified components.

Visual orientation can be provided by using additional data files. For STATSGO interpretative maps and for many other natural resource interpretive maps, a shaded relief background provides visual reference of the topography that is easily understood. An example is the shaded relief background image from USGS Digital Elevation Model data, which is formatted in 1:250,000 scale, 1- by 2-degree quadrangles [2]. Other data types, such as USGS Digital Line Graph transportation and hydrography layers, help orient a reader to a map [8]. If transportation or hydrography data need to be incorporated into an analysis, it may be desirable to create a buffer zone around the linear feature and then use an overlay operation to intersect the resulting corridor area with the interpreted soil map.

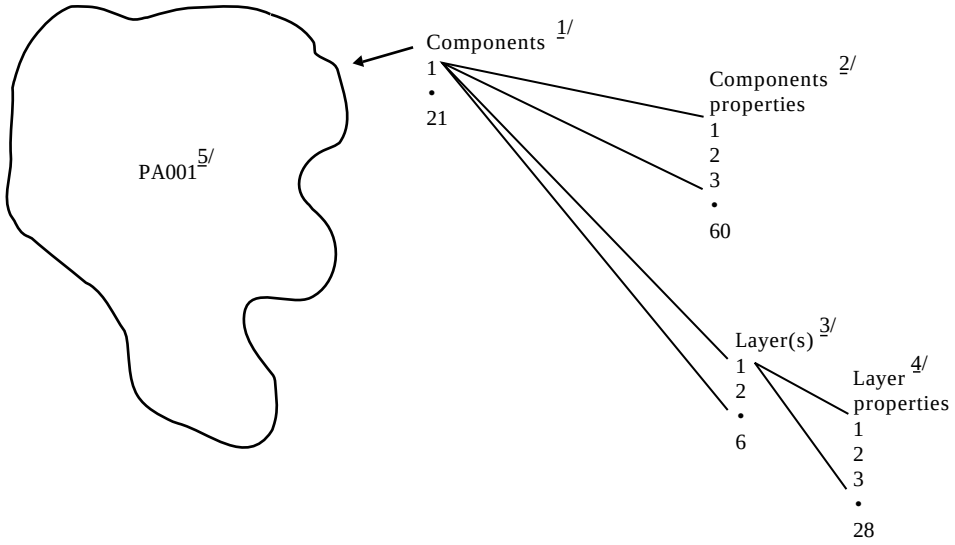
Complex models can be constructed using the soil attribute data in conjunction with other data sources. The model output can be displayed in map form using a geographic

information system. Examples include soil erosion, soil leaching potential, and land use suitability models. Calculations are typically made on the basis of each component soil phase. For example, in an erosion model, the slope and erodibility (kfactor) are extracted for each soil phase. The results of the calculation for each component can then be displayed in map form using the percentage composition techniques discussed earlier [1].

Analysis of STATSGO data

In STATSGO, each map unit can have multiple components and each component can have multiple layers (fig. 1). Therefore, the analysis must begin at the lowest level in the schema and work back to the highest level. The order from the bottom to the top is layer, comp (component), and mapunit (map unit) tables (fig. 2). The layer table is related to the comp table by muid (map unit identifier) and seqnum (sequential number), which is the component number. The comp table is related to the mapunit table by muid, and the mapunit table is related to the map data by muid. Other tables such as compyld (component yield), interp (interpretation), plantcom (plant community), rsprod (range site productivity), taxclass (taxonomic class), windbrk (windbreak), wlhabit (wildlife habitat), and woodmgt (woodland management) are on the same level with comp and relate to the comp table with muid and seqnum. Refer to figure 3 for the STATSGO attribute relational data base schema.

Figure 1. *STATSGO map unit*



[1]STATSGO map units consist of 1 to 21 components.
[2]For each component, there are 60 soil properties and interpretations in 84 different data elements (component tables), for example, flooding.
[3]For each component, there are 1 to 6 soil layers.
[4]For each layer, there are 28 soil properties; for example, percent clay.
[5]A map unit identifier created by concatenation of the two-character State FIPS code and a three-digit Arabic

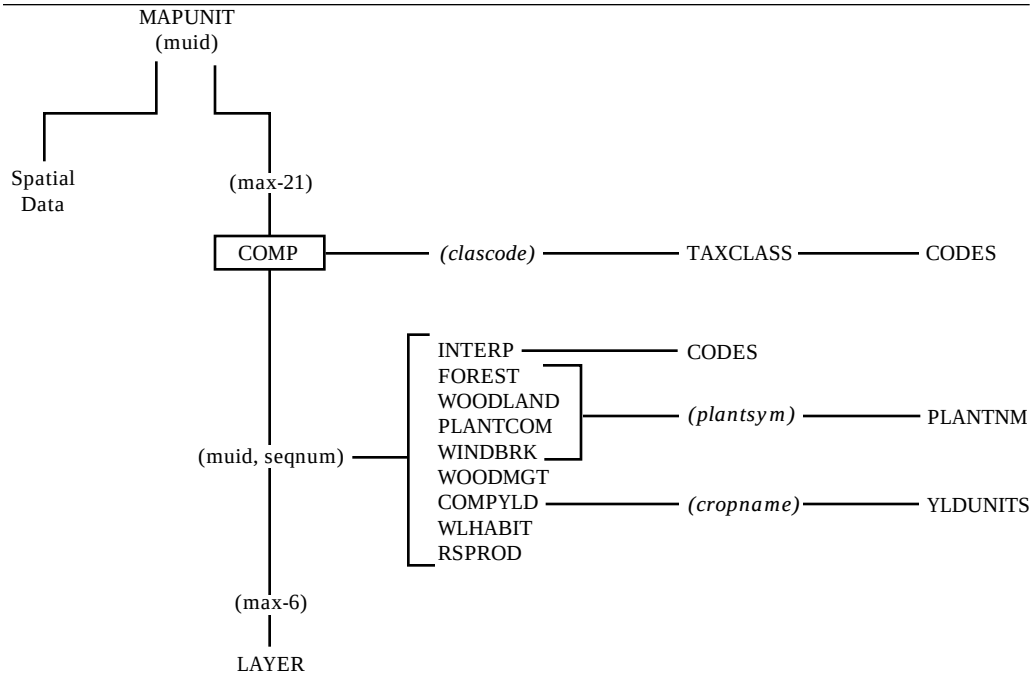
number. It uniquely identifies a map unit within a State.

The comp table can be considered as the hub through which all analyses pass (fig. 2). This is necessary to acquire the comppct (component percent) of each map unit that meets a criterion or criteria.

Because there are several layers in the layer table for each component in the comp table, a decision must be made as to how the data should be handled. Methods include selecting for the presence or absence of a property, selecting a specific layer, or aggregating the data by calculating a weighted average or the sum of the weighted average.

An example for selecting for the presence of a property is locating all map unit components that have a pH of less than 4.5 and aggregating the component percents by map units. An example of selecting a specific layer is selecting the surface layer for organic matter content and averaging the low and high values. A weighted average can be calculated for clay. The low and high values can be averaged and multiplied by the layer thickness and then divided by the total soil thickness. The sum of the weighted average can be calculated for available water capacity. The low and high values can be averaged, multiplied by the layer thickness, and then summed. These methods reduce a many-to-one relationship to a one-to-one relationship.

Figure 2. *STATSGO table relationships*



STATSGO map development

An example of layer data aggregation and map development for two map units in the Delaware STATSGO data base follows. The many-to-one relationships between the layer and the comp (component) tables are reduced to one-to-one relationships by calculating the sums of the weighted averages for the available water capacity. The attributes required for this example are in the mapunit, comp, and layer tables (fig. 3). Analysis begins at the layer table which is at the lowest level in the data base schema. The results of the data aggregation are moved to the comp table. The comppcts (component percents) are aggregated by map units to reduce the many-to-one relationships that exists between the comp and the mapunit tables.

(1) Calculate weighted averages

The column wtavg in example 1 was added to selected layer table attributes to hold the weighted averages of the available water capacity calculated as follows:

$$\text{wtavg} = (\text{laydeph} - \text{laydepl}) \times \frac{(\text{awcl} + \text{awch})}{2}$$

The wtavg is the total inches of available water in each soil layer (horizon). The laydepl and laydeph are the beginning and ending depths of the soil layer (horizon) measured from the soil surface. The awcl and awch are the low and high values for the range in the available water capacity for each soil layer.

Example 1. *Layer table attributes and weighted averages*

muid	seqnum	layernum	laydepl	laydeph	awcl	awch	wtavg
DE001	1	1	0	40	0.04	0.09	2.6
DE001	1	2	40	60	0.16	0.20	3.6
DE001	2	1	0	40	0.04	0.09	2.6
DE001	2	2	40	60	0.16	0.20	3.6
DE001	3	1	0	16	0.04	0.09	1.04
DE001	3	2	16	30	0.04	0.09	0.91
DE001	3	3	30	72	0.04	0.10	2.1
DE001	4	1	0	24	0.04	0.10	1.68
DE001	4	2	24	36	0.10	0.16	1.56
DE001	4	3	36	80	0.00	0.05	0.6
DE001	5	1	0	11	0.15	0.20	1.925
DE001	5	2	11	27	0.15	0.18	2.64
DE001	5	3	27	60	0.06	0.16	3.63
DE001	6	1	0	11	0.08	0.16	1.32
DE001	6	2	11	29	0.06	0.16	1.98
DE001	6	3	29	60	0.06	0.16	3.41
DE001	7	1	0	17	0.06	0.10	1.36

DE001	7	2	17	37	0.10	0.15	2.5
DE001	7	3	37	60	0.04	0.10	1.61
DE001	8	1	0	39	0.06	0.11	3.315

Example 1. *Layer table attributes and weighted averages*—Continued

muid	seqnum	layernum	laydepl	laydeph	awcl	awch	wtavg
DE001	8	2	39	47	0.06	0.08	0.56
DE001	8	3	47	60	0.11	0.17	1.82
DE001	9	2	0	30	0.10	0.20	4.5
DE001	9	2	30	34	0.02	0.07	0.18
DE001	9	3	34	60	0.06	0.12	2.34
DE001	10	1	0	20	0.10	0.18	2.8
DE001	10	2	20	38	0.14	0.20	3.06
DE001	10	3	38	60	0.06	0.20	2.86
DE002	1	1	0	40	0.04	0.09	2.6
DE002	1	2	40	60	0.16	0.20	3.6
DE002	2	1	0	40	0.04	0.09	2.6
DE002	2	2	40	60	0.16	0.20	3.6
DE002	3	1	0	10	0.10	0.20	1.5
DE002	3	2	10	28	0.10	0.15	2.25
DE002	3	3	28	40	0.06	0.10	0.96
DE002	3	4	40	60	0.06	0.18	2.4
DE002	4	1	0	10	0.10	0.20	1.5
DE002	4	2	10	28	0.10	0.15	2.25
DE002	4	3	28	40	0.06	0.10	0.96
DE002	4	4	40	60	0.06	0.18	2.4
DE002	5	1	0	11	0.08	0.16	1.32
DE002	5	2	11	29	0.06	0.16	1.98
DE002	5	3	29	60	0.06	0.16	3.41
DE002	6	1	0	14	0.10	0.15	1.75
DE002	6	2	14	32	0.12	0.16	2.52
DE002	6	3	32	60	0.03	0.06	1.26
DE002	7	1	0	10	0.10	0.16	1.3
DE002	7	2	10	36	0.12	0.19	4.03
DE002	7	3	36	60	0.14	0.20	4.08

DE002	8	1	0	11	0.15	0.20	1.925
DE002	8	2	11	27	0.15	0.18	2.64
DE002	8	3	27	60	0.06	0.16	3.63

(2) Calculate the sums of weighted averages

The weighted averages of the available water for the soil layers are summed by soil components into the comp table in example 2. The comp and the layer tables are related by muid and seqnum. The summation of the weighted averages (sum_wtavg) is the total inches of water available in soil profiles and is computed as follows:

$$\text{sum\_wtavg} = \sum \text{wtavg}$$

Example 2. *Comp table attributes and sums of weighted averages*

muid	seqnum	comppct	sum_wtavg
DE001	1	42	6.2
DE001	2	4	6.2
DE001	3	2	4.05
DE001	4	12	3.84
DE001	5	10	8.195
DE001	6	9	6.71
DE001	7	7	5.47
DE001	8	5	5.695
DE001	9	6	7.02
DE001	10	3	8.72
DE002	1	11	6.2
DE002	2	5	6.2
DE002	3	18	7.11
DE002	4	12	7.11
DE002	5	17	6.71

DE002	6	14	5.53
DE002	7	12	9.41
DE002	8	11	8.195

(3) Define available water capacity categories

Multiple maps, categories, are required to display the results of analyses of complex STATSGO data. The series of maps normally have legends that display the percent of the map unit that meets a criterion or criteria. Example 3 shows the available water capacity categories commonly used by NRCS [3]. In this example, five maps could be generated. Category codes based on the sums of the weighted averages are assigned.

Example 3. *Available water capacity categories*

Category code	Category label	Available water capacity (inches)
1	very low	0 to 3 inches
2	low	3 to 6 inches
3	moderate	6 to 9 inches
4	high	9 to 12 inches
5	very high	>12 inches

(4) Assign category codes

Category codes defined in example 3 are assigned to components beginning with 1 for very low and ending with 5 for very high available water capacity. The category codes are in cat_code in example 4.

Example 4. *Comp table attributes and category codes*

muid	seqnum	comppct	sum_wtavg	cat_code
DE001	1	2	6.2	3
DE001	2	4	6.2	3
DE001	3	2	4.05	2
DE001	4	12	3.84	2
DE001	5	10	8.195	3
DE001	6	9	6.71	3
DE001	7	7	5.47	2
DE001	8	5	5.695	2
DE001	9	6	7.02	3
DE001	10	3	8.72	3
DE002	1	11	6.2	3
DE002	2	5	6.2	3
DE002	3	18	7.11	3
DE002	4	12	7.11	3
DE002	5	17	6.71	3
DE002	6	14	5.53	2
DE002	7	12	9.41	4

DE002	8	11	8.195	3

(5) Aggregate the sums of component percents

Aggregate the sums of the component percents by muid into the mapunit table (example 5) to reduce the many-to-one relationships that exist between the mapunit and comp tables. With STATSGO data, it is impossible to display all of the results of the analyses on one map, so a series of maps is generated, one for each category. Because five categories have been defined for available water capacity, up to five maps may be generated. The comp table is related to the mapunit table by muid, and the sum of the comppcts will be calculated from the comp table into pct1, pct2, pct3, pct4, and pct5 in the mapunit table. Pct1 corresponds to category 1, and pct5 corresponds to category 5.

Example 5. *Mapunit table attributes and sums of comppcts*

muid	pct1	pct2	pct3	pct4	pct5
DE001	0	26	74	0	0
DE002	0	14	74	12	0

(6) Define legend classes

The legend for STATSGO maps is commonly in terms of percent of the map unit that meets a criterion or criteria. Four legend classes are defined in example 6. A class code is assigned to each of the four classes, beginning with 1 for 0 to 25 percent and ending with 4 for 76 to 100 percent. Water, if present, is assigned a class code of 5.

Example 6. *Legend classes*

Legend class code	Legend classes
1	0 to 25 percent
2	26 to 50 percent

3	51 to 75 percent
4	76 to 100 percent

Legend class codes are assigned for pct1 through pct5 in map1 through map5 in example 7. In this example, 0 percent is included in legend class 1. However, 0 percent could be separated into a legend class of *criteria not met*. The legend class codes can be linked to the map data by muid and to a color lookup table for polygon shading on each map.

Example 7. *Category percents and legend class codes*

muid	pct1	pct2	pct3	pct4	pct5	map1	map2	map3	map4	map5
DE001	0	26	74	0	0	1	2	3	1	1
DE002	0	14	74	12	0	1	1	3	1	1

Conclusion

This brief description concerns how one attribute at the layer table level is handled. Even though the logic is the same, the process becomes more complicated when several

Data collection

Specifications used for compiling STATSGO

attributes from different tables are being evaluated. An example would be pesticide leaching potential that involves organic matter and surface layer thickness from the layer table and hydrologic groups from the comp table.

Compilation procedures

Draft soil map unit lines using available references such as soil survey maps, published and unpublished; county general soil maps; State general soil maps; State major land resource area (MLRA) maps; and LANDSAT images.

Draft soil map unit lines and symbols in red pencil on a mylar overlay that is punch registered to fit the mylar USGS 1:250,000 topographic quadrangle. Do not transfer the USGS topographic quadrangle neatline to the overlay as it will be added during the digitizing process.

Maintain soil map unit line quality to facilitate scanning by:

- Periodically sharpening the pencil to maintain consistent line widths and density
- Closing all gaps or skips in lines
- Closing all delineations
- Using a dark red pencil that is easily scanned

Map units

Complete a 100 percent edit on all compiled mylar overlays before digitizing.

Map unit delineations

Approximate minimum area delineated is 625 hectares (1,544 acres), which is represented on a map of 1:250,000 scale by an area appropriately 1 cm by 1 cm (0.4 inch by 0.4 inch). Linear delineations should not be less than 0.5 cm (0.2 inch) in width. The number of delineations per 1:250,000 quadrangle should range from 100 to 200, but a range of up to 400 is allowed.

Map unit delineations must join at State boundaries and composition of map units must be coordinated across State boundaries, not only in the identity, but also in the relative extent of each component. All component phase criteria are to join across State boundaries.

Components

Map units will be a combination of associated phases of soil series. The information about map units includes reliable estimates of the components and the percentage and method by which the composition is determined. Composition is determined by transecting representative segments of map units in published or unpublished soil surveys and documenting component composition or by using acreage data in the map unit use file. Transects may be observed in the field; however, it is more likely that they will be located and examined on soil survey field sheets or in published soil surveys. A suggested procedure consists of four steps.

1. Plot transects on the general soil map so that they afford complete and representative coverage of the respective map unit. Plot transects on published soil survey atlas sheets or unpublished soil survey field sheets so that they cut across the more detailed

delineations that make up the corresponding map unit on the general soil map. Based on the judgment of the soil scientist, they should be located to intersect delineations of soils most representative of the map unit when subsequently plotted on the published atlas sheets or field sheets for measuring. Generally, transects are located at right angles to drainage patterns, include the complete range in elevation, and represent the typical landscape. Transects also include and represent uniform space across the delineated map unit. All map units are to be sampled by transects. The number of transects being used are proportional to the relative size, number, and complexity of the delineations. NRCS State staffs will submit their verification procedures to their National Technical Center with the compiled maps for review.

2. Measure and record the length of the segments of each map unit along the transect crossing the detailed soil map on the atlas or field sheets.

3. Combine data on segment lengths for all delineations of each map unit. Using routine correlation procedures, determine which map components from the atlas or field sheets can be combined and make combinations so that not more than 21 phases of soil series or comparable detailed units are identified as components of the map unit on the general soil map.

Procedures used for digitizing STATSGO

4. Determine the percentage of the general soil map unit occupied by each component by the percentage of the total length of the transects crossing the area of the general soil map unit.

Features to be digitized

The following map features are digitized:
- Line features - State boundaries
- Area features - soil and water (shoreline) boundaries

Note: Do not digitize the map neatline.

Line features are not labeled in the STATSGO data. Soil and water polygons and areas beyond the data limits and within the quadrangle are labeled. Feature labels for STATSGO data are in table 1.

Table 1. *Soil feature labels*

Type	Description	Feature labels
Line	Soil boundary	—
Line	Water boundary	—
Line	Map neatline	—
Line	State boundary	—
Point	Map unit identifier	PA001

Data capture

Point	Water	PAW
Point	Area beyond data and within quadrangle	NODATA

The following standards and specifications apply to digitizing STATSGO data from 1:250,000 scale USGS topographic quadrangles.

Soil and water boundaries
Digitize all soil and water boundaries within a 0.01-inch line width following the center line of the digitizing source. Represent each soil boundary with no greater number of coordinate pairs than is necessary to maintain the 0.01-inch accuracy limit.

Digitize islands (polygons that do not connect to or intersect with another soil or water boundary) as a continuous line segment with only a beginning and ending node. Connect beginning and ending points of each digitized line at a common intersecting point with another soil boundary, water boundary, State boundary, or the map neatline.

State boundaries
State boundaries are the limit of the survey and must meet the same 0.01-inch accuracy standard as soil and water boundaries. The State boundary is considered as part of soil and water delineations.

Map neatline
The map neatline is considered as part of soil and water boundaries and forms the maximum extent of the digital data set. Construct the map neatline as four separate line boundary segments. The beginning and ending point of each neatline will be identical to the four corner coordinate values of the 1– by 2–degree quadrangle. These values must be explicitly entered and not digitized. Enter all 7.5 minute tic marks for geographic control. Soil boundaries intersecting the map neatline must have a common point of intersection and must not extend beyond or fall short of the map neatline.

Labeling

Map unit identifiers
The map unit identifiers will consist of the alpha state FIPS code followed by a three-character Arabic number and will be identical to those shown on the original soil map, for example, PA001. Position the label point for the map unit identifier at the centroid of the soil area. If the centroid falls outside of the soil area, move the label point for the map unit identifier into the soil area.

Quality control

Soil areas missing a map unit identifier should be labeled **XXX** until the symbol is determined. Areas outside the limit of the soil survey boundary but within the neatline are to be labeled **NODATA**. Water areas are to be labeled with the alpha state FIPS code followed by the letter **W**, for example, **PAW**.

Edge matching

The soil boundaries ending at all four edges of each quadrangle should be computer joined to any adjoining map sheets to achieve an exact match. However, if this is not possible due to system limitations, match the soil boundaries on the adjoining quadrangles within 0.01-inch, center line to center line. Check the adjoining map sheets before digitizing and revise, if necessary, to ensure that lines and boundaries match.

Statistics

Develop acreage calculations and a total polygon count by map unit for each soil map data set on each 1:250,000 quadrangle. Print a computer generated hard copy of the statistics for each soil map data set. A sample printout with acreage and polygon statistics is in table 2. Sort the records by map unit identifier, water, and NODATA. Show the acreages to the nearest acre.

Table 2. *Acreages and polygon statistics*

PA001	27,081
PA002	2,371
PA003	289,688
NODATA	3,067
PAW	532
Total Acres	———
Total Polygons	——

Calculate the total acreage within the map neatline, including the areas outside the limit of the soil survey that are labeled NODATA, and summarize the acreage.

State edit

A complete and detailed edit of the digitizing work is required. The state soil scientist is responsible for ensuring that the digital soil data match the digitizing source. The digitized soil data must be carefully checked against the source maps to ensure that all data are correctly and completely digitized.

Check plots

Generate a check plot for each digitized soil map data set at the same scale and map projection as the original soil map sheet. The check plots are to accurately represent the data on the magnetic tape data sets.

- Generate the check plots with either ball pen (standard point) or wet ink, using a 0.01-inch line width on mylar material. Plot all data within 0.005 inch of its coordinate location in the data base.

- Plot map unit identifiers as a line of single stroke characters, height and width of 0.10 inch. The map unit identifiers should duplicate the sequence of the source maps. The digital origin points for the map unit identifiers will not appear on the check plots. Plot soil boundaries, neatlines, State boundaries, and map unit identifiers in black. Plot water boundaries and water area names in blue. Soil symbols that are unidentifiable

and labeled as XXX are plotted in red.

- Label the check plot with the appropriate data set name and plotting scale at some point beyond the data set limits.

- Check plots are to be free of dirt, smudges, scratches, and other defects.

National Technical Center review

The National Technical Center GIS specialist is responsible for:

- Resolving discrepencies among states
- Checking map unit composition within and among states
- Maintaining consistency among states

National Cartography and GIS Center preliminary review

A preliminary edit is required after the first two adjoining soil map sheets are digitized. Forward the following materials to the NRCS National Cartography and GIS Center:

- Check plots
- Digital data sets on magnetic tape
- Summary acreage calculation with a total polygon count for each map sheet
- Original source materials

Data structure

Projection information

National Cartography and GIS Center final review

A final review is required before the data are archived into the STATSGO data base. The data are joined to adjoining States and the distribution of map unit identifiers in the spatial data are compared to those in the data base tables.

Map information for the STATSGO data base was captured as 1:250,000 scale USGS topographic quadrangle units in a Universal Transverse Mercator ground based system. The horizontal datum reference system was the North American Datum of 1927 which is based upon the Clarke 1866 spheroid. The topographic quadrangle units were projected into an Albers Equal Area projection and merged into statewide coverage. The projection parameters are in table 3.

Table 3. *Projection parameters*

projection	Albers equal area
units	meters
1st standard parallel	29 30 00
2nd standard parallel	45 30 00
central meridian	–96 00 00
latitude of origin	23 00 00
false easting	0.00
false northing	0.00

Spatial data distribution formats

Digital Line Graph

The spatial component of the STATSGO data base is archived and distributed in a modified Digital Line Graph optional format and in an uncompressed ARC/INFO export file format.

An example of a modified Digital Line Graph optional format file is shown in example 8. The Digital Line Graph contains header records and data records consisting of node identification records, area identification records, and line identification records. The area identification records in the Digital Line Graph contain major and minor code pairs.

Example 8. *Digital Line Graph file*

```
ESRI    DLG DATA - CHARACTER FORMAT - 05-08-92 VERSION
PENNSYLVANIA                              1991         250000
USDA/NRCS STATSGO DATA
     3     3     0     2 0.63500127000D+01     4     0     4     1  0  0
   0.000000000000000D+00   0.000000000000000D+00   0.293000000000000D+06
   0.453000000000000D+06  -0.960000000000000D+06   0.230000000000000D+06
   0.000000000000000D+00   0.000000000000000D+00   0.000000000000000D+00
   0.000000000000000D+00   0.000000000000000D+00   0.000000000000000D+00
   0.000000000000000D+00   0.000000000000000D+00   0.000000000000000D+00
 0.10000000000D+01 0.00000000000D+00 0.00000000000D+00 0.00000000000D+00
SW       32.000000  -84.000000        1196917.29  1863172.95
NW       36.000000  -84.000000        1131189.23  2306107.79
NE       36.000000  -78.000000        1768136.86  2428214.30
SE       32.000000  -78.000000        1870874.93  1992374.49
SOILS                   0  2380  2380 010  1288  1288 010  3416  3416   1
N    1  1679039.38  2293269.75           3           0     0
  2921  2920    -9
N    2  1684550.75  2294351.25           2           0     0
 -2923 -2920
N    3  1673456.00  2292043.75           3           0     0
  2922 -2921    -1
.
.
.
(printout continues)
.
.
.
A    1  1131188.23  1863171.95     0   243     0     1     0     0
 -2920  2921  2922 -2924  2927  2928  2929 -2930  2931  2932  2936 -2937
 -2951 -2952 -2956 -2958 -2962 -2963 -2964  2965  2966  2967 -2968 -2969
 -2970  2973  2974 -2975 -2976 -2979 -2980 -2984 -2994 -2997 -3003 -3004
 -3009 -3011 -3015 -3016 -3018 -3020 -3021 -3022 -3023 -3024 -3025 -3026
 -3027 -3029 -3030 -3031 -3032 -3033  3019  3017  2978 -3005 -3013 -3035
 -3058 -3062 -3071 -3080 -3133 -3138 -3141 -3142 -3145 -3159 -3162 -3164
 -3165 -3166 -3200 -3242 -3249 -3272 -3275  3323 -3328 -3338 -3350  3409
  3413 -3416  3414  3411  3410  3408  3407  3406  3405  3403  3402  3400
 -3398 -3390 -3388  3386  3385 -3384 -3382 -3379 -3374 -3371  3365  3362
  3358  3353  3351  3345  3340  3334  3331  3327  3325  3324  3322  3321
```

```
  3320  3319  3318  3317  3316  3315  3314  3312  3311  3310  3309  3307
  3306  3305  3304  3303  3302  3301  3299  3297 -3295  3293 -3292 -3291
 -3289 -3286 -3284 -3282  3279 -3276  3274  3270  3266  3264  3235  3233
  3231  3228  3226  3225  3223  3222  3213  3207 -3179 -3184 -3186 -3185
  3137  3134  3132  3116  3114  3110  3088  3083  3081  3078  3075  3072
```

Example 8. *Digital Line Graph file*—Continued

```
  3069  3055  3052  3049  3048  3046  3045  3037  3028   3014  3012  3010
  3008  3007  3006  3000  2996  3002  2998  2999  3001   2995  2993  2992
  2991  2990  2989  2988  2985  2986  2987  2983  2982   2981  2977  2972
  2971  2961  2960  2959  2957  2954  2955  2953  2950   2949  2947  2948
  2946  2940  2939  2942  2938  2941  2943  2945  2944   2935  2934  2933
  2925  2926  2923
     0     0
A    2  1686811.12  2289302.00     0    19     0     1      0     0
     9  2920 -2923   -10 -2945   -13 -2941 -2938 -2942  -2939 -2940 -2946
 -2948 -2947 -2949 -2950 -2953    26    29
   900    26
A    3  1680287.00  2289372.75     0     7     0     1      0     1
     1 -2921    -9   -12    11     0     6
   900    25
A    4  1669851.25  2289142.50     0     4     0     1      0     0
    -1    -4     3 -2922
   900    98
.
.
.
(printout continues)
.
.
.
L    1     4     3    4     3      6     0     0
  1673728.38  2290495.25  1673642.25  2290578.50  1673541.38  2290727.25
  1673402.12  2291346.00  1673356.50  2291848.50  1673456.00  2292043.75
L    2    10    11    8      9          38     00
  1661458.00  2289424.75  1661462.12  2289406.50  1661698.62  2289254.75
  1662381.88  2289066.50  1662679.88  2288791.50  1662834.75  2288552.75
  1663154.62  2288180.25  1663538.75  2287822.25  1663836.75  2287547.00
  1663920.25  2287326.25  1663956.88  2287163.50  1663929.25  2286986.50
  1663716.62  2286733.00  1663316.75  2286711.50  1663006.00  2286743.50
  1662680.38  2286841.50  1662544.75  2286845.00  1662290.75  2286924.75
  1662155.12  2286928.25  1661829.62  2287025.75  1661422.50  2287036.50
  1660743.88  2287055.00  1660704.50  2287080.25  1660215.88  2287004.00
  1659410.75  2286685.50  1659168.62  2286562.75  1659143.88  2286522.50
  1658669.88  2286381.50  1658284.75  2286294.75  1657692.38  2286229.75
  1657009.38  2286417.50  1656683.88  2286515.00  1656462.00  2286601.75
  1656171.25  2286844.50  1655836.62  2287282.25  1655642.25  2287546.25
```

```
  1655447.88  2287810.00   1655252.75  2288078.00
L    3    16    5     7      4                25     0     0
  1668350.50  2285622.25   1668388.12  2285904.50  1668386.38  2286211.75
  1668389.12  2286349.25   1668414.00  2286389.00  1668362.62  2286617.00
  1668178.38  2286986.00   1668124.25  2287076.50  1668008.75  2287290.25
```

Example 8. *Digital Line Graph file*—Continued

```
  1667969.38  2287315.25   1667950.12  2287550.75  1667898.88  2287778.75
  1667748.38  2287847.50   1667215.75  2287966.50  1667026.00  2288060.50
  1666900.38  2288169.00   1666752.75  2288375.50  1666521.75  2288802.50
  1666421.00  2288950.75   1666266.00  2289189.50  1666035.00  2289616.75
  1665988.12  2289674.75   1665793.88  2289938.75  1665417.00  2290264.25
  1665418.75  2290287.50
.
.
.
(printout continues)
.
.
```

Digital Line Graph attribute file

```
.
L 3416  2366  2365     1  1279                    3    0     0
  1320186.62  1964287.88   1309551.62  1962560.88  1309214.90
1964436.36
```

Map unit identifiers (e.g., PA001) are not carried within the modified Digital Line Graph file; however, they are made available in a companion attribute file. The attribute file links the minor codes in the Digital Line Graph files to the feature labels. Similar map unit identifiers in the map sets will have the same minor code, so the conversion file is a universal conversion legend. Example 9 shows the format and contents of an attribute file. The columns are space delimited and the columns are left justified. The first column corresponds to the minor code in the Digital Line Graph. The second column is the map unit identifier, which is the muid element in the data base tables.

Example 9. *Attribute file*

```
0 UNIV
1 PA001
2 PA002
3 PA003
4 PA004
6 PA006
.
.
.
(printout continues)
.
.
.
98 PA100
99 PA101
100 PAW
```

ARC/INFO export

```
101 PA103
102 PA104
103 PA105
104 PA106
```

An example of an uncompressed ESRI ARC/INFO export file is shown in example 10. The map unit identifier is carried in the export file.

Example 10. *ARC/INFO export file*

```
EXP 0 /DATA_SGIS1/EXPORT/TEMP/PENNSYLVANIA.E00
ARC 3
         1       415              1          2       4      5
38
 1.66145800000000E+06 2.28942475000000E+06
 1.66146212500000E+06 2.28940650000000E+06
 1.66169862500000E+06 2.28925475000000E+06
 1.66238187500000E+06 2.28906650000000E+06
 1.66267987500000E+06 2.28879150000000E+06
 1.66283475000000E+06 2.28855275000000E+06
 1.66315462500000E+06 2.28818025000000E+06
 1.66353875000000E+06 2.28782225000000E+06
 1.66383675000000E+06 2.28754700000000E+06
 1.66392025000000E+06 2.28732625000000E+06
 1.66395687500000E+06 2.28716350000000E+06
 1.66392925000000E+06 2.28698650000000E+06
 1.66371662500000E+06 2.28673300000000E+06
 1.66331675000000E+06 2.28671150000000E+06
 1.66300600000000E+06 2.28674350000000E+06
 1.66268037500000E+06 2.28684150000000E+06
 1.66254475000000E+06 2.28684500000000E+06
 1.66229075000000E+06 2.28692475000000E+06
 1.66215512500000E+06 2.28692825000000E+06
 1.66182962500000E+06 2.28702575000000E+06
 1.66142250000000E+06 2.28703650000000E+06
 1.66074387500000E+06 2.28705500000000E+06
 1.66070450000000E+06 2.28708025000000E+06
 1.66021587500000E+06 2.28700400000000E+06
 1.65941075000000E+06 2.28668550000000E+06
 1.65916862500000E+06 2.28656275000000E+06
 1.65914387500000E+06 2.28652250000000E+06
 1.65866987500000E+06 2.28638150000000E+06
 1.65828475000000E+06 2.28629475000000E+06
 1.65769237500000E+06 2.28622975000000E+06
 1.65700937500000E+06 2.28641750000000E+06
 1.65668387500000E+06 2.28651500000000E+06
```

```
 1.65646200000000E+06 2.28660175000000E+06
 1.65617125000000E+06 2.28684450000000E+06
 1.65583662500000E+06 2.28728225000000E+06
 1.65564225000000E+06 2.28754625000000E+06
 1.65544787500000E+06 2.28781000000000E+06
 1.65525275000000E+06 2.28807800000000E+06
```

Example 10. *ARC/INFO export file*—Continued

```
         2        409          3          4         3             2
25
 1.66835050000000E+06 2.28562225000000E+06
 1.66838812500000E+06 2.28590450000000E+06
 1.66838637500000E+06 2.28621175000000E+06
 1.66838912500000E+06 2.28634925000000E+06
 1.66841400000000E+06 2.28638900000000E+06
 1.66836262500000E+06 2.28661700000000E+06
 1.66817837500000E+06 2.28698600000000E+06
 1.66812425000000E+06 2.28707650000000E+06
 1.66800875000000E+06 2.28729025000000E+06
 1.66796937500000E+06 2.28731525000000E+06
 1.66795012500000E+06 2.28755075000000E+06
 1.66789887500000E+06 2.28777875000000E+06
 1.66774837500000E+06 2.28784750000000E+06
 1.66721575000000E+06 2.28796650000000E+06
 1.66702600000000E+06 2.28806050000000E+06
 1.66690037500000E+06 2.28816900000000E+06
 1.66675275000000E+06 2.28837550000000E+06
 1.66652175000000E+06 2.28880250000000E+06
 1.66642100000000E+06 2.28895075000000E+06
 1.66626600000000E+06 2.28918950000000E+06
 1.66603500000000E+06 2.28961675000000E+06
 1.66598812500000E+06 2.28967475000000E+06
 1.66579387500000E+06 2.28993875000000E+06
 1.66541700000000E+06 2.29026425000000E+06
 1.66541875000000E+06 2.29028750000000E+06
.
.
.
(printout continues)
.
.
.
900       55
 9.09248217187500000E+06 1.95738239953091324E+04      1275
1275PA054
900        54
```

```
 3.42588714296875000E+07 3.51416440596391767E+04      1276
1278PA052
900        52
 8.92557403125000000E+06 1.46329345386831810E+04      1277
1279PA043
900        43
```

Example 10. *ARC/INFO export file*—Continued

```
 1.79475905468750000E+06 5.62948103835544134E+03      1278
1280PA055
900        55
 3.25968743195953369E+07 6.36109159277651052E+04      1279
1281PA041
900        41
 1.28652600781250000E+06 5.12377500485368091E+03      1280
1283PA040
900        40
 1.01487028125000000E+06 5.43340858518251116E+03      1281
1284PA040
900        40
 3.09885935909710693E+09 1.19718178573947051E+06      1282
1137PA040
900        40
 3.34124028589425087E+07 5.53501553408423060E+04      1283
1272PA041
900        41
 1.08174580271874070E+07 2.55930252448080100E+04      1284
1282PA041
900        41
PENN.TIC                          XX   3   3  20       25
IDTIC             4-1   14-1   5-1 50-1  -1  -1-1
1-
XTIC              8-1   54-1  18 5 60-1  -1  -1-1
2-
YTIC              8-1  134-1  18 5 60-1  -1  -1-1
3-
          1 1.87087493353809579E+06 1.99237448876657616E+06
          4 1.76813686135980324E+06 2.42821430020608567E+06
          2 1.19691728670086781E+06 1.86317295168879256E+06
          3 1.13118922952925996E+06 2.30610779476504587E+06
          5 1.70344261104499944E+06 1.95476180387122929E+06
          6 1.53525585357473581E+06 1.92068085182895791E+06
          7 1.36638914909168426E+06 1.89014672669817694E+06
          8 1.60989899314310472E+06 2.39266709529891144E+06
          9 1.45094811933275824E+06 2.36045768006974086E+06
         10 1.29135463742738101E+06 2.33160031969503872E+06
         11 1.84516310240168893E+06 2.10145031038418133E+06
```

```
        12 1.68003183783905394E+06 2.06435454459725786E+06
        13 1.51415650665920344E+06 2.03074197430951707E+06
        14 1.34761057312261965E+06 2.00062748613852821E+06
        15 1.18046779849178740E+06 1.97402441744185332E+06
        16 1.81946363089675712E+06 2.21047369944842812E+06
        17 1.65663231815013057E+06 2.17389460428783204E+06
```

Example 10. *ARC/INFO export file*—Continued

```
        18 1.49306730216218880E+06 2.14075019060434680E+06
        19 1.32884102398160798E+06 2.11105513767440896E+06
        20 1.16402621752241836E+06 2.08482259709257912E+06
        21 1.79378519370816555E+06 2.31940785584290326E+06
        22 1.63325195032972936E+06 2.28334500842782203E+06
```

Attribute data distribution formats

```
        23 1.47199535860373732E+06 2.25066836817518249E+06
        24 1.31008683720453177E+06 2.22139240718999412E+06
        25 1.14759809353854344E+06 2.19553009145585541E+06
EOI
EOS
```

Prelude table

VentureCom's Prelude tables are simple ASCII text files. The first two lines of a table are called the header lines. The first line contains the names of each column, and the second line contains at least one dash underneath each column name. Tabs separate the column names and the dashes. A newline character is at the end of each of these lines. Each subsequent line (row) is also delimited by a newline character and forms a record in the table. A row consists of tab-separated fields (columns). Each row has the same number of columns as the table header. If a column is empty, two consecutive tabs indicate that the column is present.

ARC/INFO export

Attribute (tabular) data

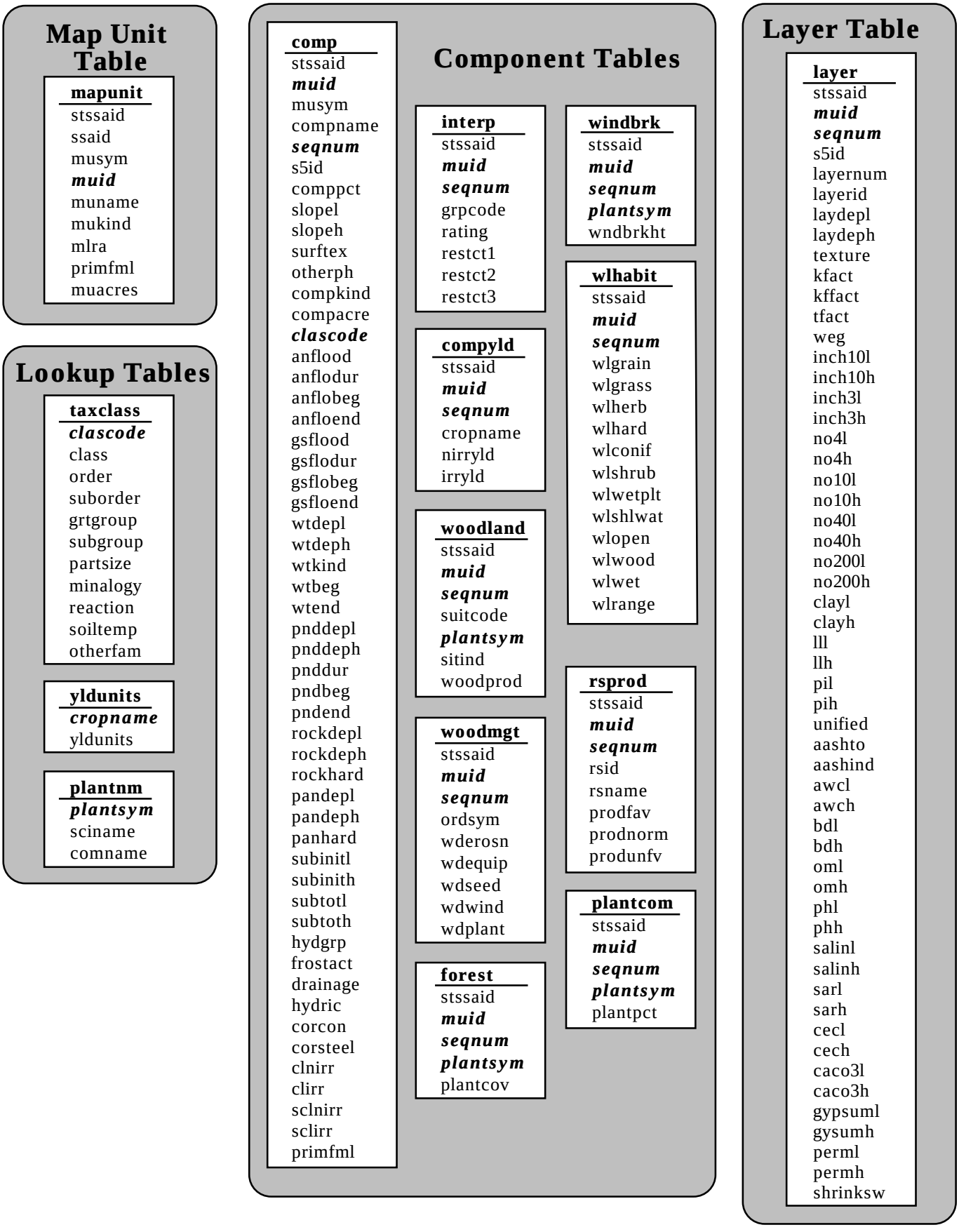
The INFO data file structures for the export files are in appendix A. The data base schema for the export files are similar to the schema for the Prelude tables described above except for changes in the layer table. The texture, unified, and aashto elements in the Prelude table contain multiple values, three in texture and four each in unified and aashto. These values from these three elements were split into texture1, texture2, texture3, aashto1, aashto2, aashto3, aashto4, unified1, unified2, unified3, and unified4 elements in the INFO layer table to facilitate queries.
The attribute information for the spatial data is provided in relational tables that are downloaded from the Soil Interpretations Record data base. The Soil Interpretations Record data contain estimated and derived data on the physical and chemical soil properties and soil interpretations for engineering, water management, recreation, agronomic, woodland, range, and wildlife uses of the soil.

The soil data elements are defined in appendix B, and the soil data codes are defined in appendix C. The column types, lengths, precision value, and low and high range values for the soil data elements are listed in appendix D.

The Soil Interpretations Record data for STATSGO consist of the following tables:

- **codes** (data base codes) stores information on all codes used in the data base
- **comp** (soil component) stores soil component information
- **compyld** (component crop yield) stores crop yield information for soil components
- **forest** (forest understory) stores information for plant cover as forest understory for soil components
- **interp** (interpretation) stores interpretive ratings (both limitation ratings and suitability ratings) for soil components
- **layer** (soil layer) stores characteristics of soil layers for soil components
- **mapunit** (map units) stores information that applies to all components of a soil map unit
- **plantcom** (plant composition) stores plant symbols and percent of plant composition associated for soil components
- **plantnm** (plant name) stores the common and scientific names for plants listed in the data base
- **rsprod** (range site production) stores range site productivity information for soil components
- **taxclass** (taxonomic classification) stores the taxonomic classification for soil components
- **windbrk** (windbreak) stores information on recommended windbreak species for soil components
- **wlhabit** (wildlife habitat) stores wildlife habitat information for soil components
- **woodland** (woodland) stores information on common indicator trees for soil components
- **woodmgt** (woodland management) stores woodland management information on

Figure 3. *STATSGO attribute relational data base schema*



Data voids

soil components

- **yldunits** (yield units) stores crop names and the units used to measure yield

The STATSGO attribute relational data base schema is shown in figure 3. The attributes that link the data base tables are shown in bold italic. Appendix A contains all of the data elements in the schema. However, not all elements are populated with data in the tables.

Map hard copy production

Also, not all tables are relevant for all states.
Attribute data for some data elements may be incomplete or missing for certain portions of the United States. For example, data were not available for forest and range productivity for some STATSGO map units on U.S. Department of Agriculture's Forest Service lands in some Western States. In instances where data are unavailable, a mask should be used to exclude the area from analysis.

User support

Maps that use NRCS STATSGO data must show the source and date. The maps should also contain the following notation:

> The soil information used for this map was Natural Resources Conservation Service 199_ STATSGO data. STATSGO was compiled at 1:250,000 and designed to be used primarily for regional, multistate, State, and river basin resource planning, management and monitoring.

The user should be knowledgeable of soils data. If you need assistance, contact an NRCS soil scientist for help. The following is a listing of NRCS State soil scientist addresses and telephone numbers:

665 Opelika Rd.
P.O. Box 311
Auburn, AL 36830
(205) 887-4540

949 East 36th Avenue
Anchorage, AK 99508-4302
(907) 271-2424

Federal Office Bldg.
Rm. 5404
700 West Capitol Ave.
Little Rock, AR 72201
(501) 324-5410

Suite 200
201 E. Indianola Ave.
Phoenix, AZ 85012
(602) 280–8836

2121-C Second Street
Davis, CA 95616
(916) 757-8203

655 Parfet Street, Rm. E200C
Lakewood, CO 80215-5517
(303) 236-2910

16 Professional Park Rd.
Storrs, CT 06268-1299
(203) 487-4047

1203 College Park Drive
Dover, DE 19901-7377
(302) 678-4170

Federal Bldg., Room 248
401 S.E. 1st Ave.
Gainesville, FL 32601
(904) 377-1092

Federal Bldg., Box 13
355 East Hancock Ave.
Athens, GA 30601
(506) 546-2278

Pacific Basin Office
Suite 602, CGIC Bldg.
414 W. Soledad Ave.
Agana, Guam 96910
(700) 550–7490

300 Ala Moana Blvd.
Room 4316
P. O. Box 50004
Honolulu, HI 96850
(808) 541-2602

3244 Elder Street
Room 124
Boise, ID 83705
(208) 334-1348

1902 Fox Drive
Champaign, IL 61820
(217) 398-5286

6013 Lakeside Blvd.
Indianapolis, IN 46278
(317) 290-3203

693 Federal Bldg.
210 Walnut Street
Des Moines, IA 50309
(515) 284-4353

760 South Broadway
Salina, KS 67401
(913) 823-4558

771 Corporate Drive
Lexington, KY 40503
(606) 224-7358

3737 Government Street
Alexandria, LA 71302
(318) 473-7757

451 West Street
Amherst, MA 01002
(413) 253-4370

Busch's Frontage Road
Annapolis, MD 21401
(410) 757-2872

5 Godfrey Drive
Orono, ME 04473
(207) 866-7245

Room 101
1405 S. Harrison Road
East Lansing, MI 48823-5202
(517) 337-6680, Ext. 1205

375 Jackson St., Room 600
St. Paul, MN 55101-1854
(612) 290-3682

Federal Bldg, Suite 1321
100 West Capitol Street
Jackson, MS 39269
(601) 965-4341

601 Business Loop 80 West
Columbia, MO 65203
(314) 876-0907

Federal Bldg., Room 443
10 East Babcock Street
Bozeman, MT 59715-4704

(406) 587-6818

4405 Bland Rd.
Suite 205
Raleigh, NC 27609
(919) 790-2905

200 E. Rosser Avenue
Bismarck, ND 58502-1458
(701) 250-4435

Federal Building, Room 152
100 Centennial Mall North
Lincoln, NE 68508-3866
(402) 437-5322

Federal Building
Durham, NH 03824
(603) 868-7581

1370 Hamilton Street
Somerset, NJ 08873
(908) 246-4110, Ext. 170

517 Gold Avenue, SW
Room 3301
Albuquerque, NM 87102
(505) 766-3277

5301 Longley Lane
Reno, NV 89511
(702) 784-5875

James M. Hanley Fed. Bldg.
Room 171
100 S. Clinton Street
Syracuse, NY 13260-7248
(315) 423-5510

200 North High Street
Columbus, OH 43215
(614) 469-6914

USDA Agricultural
Center Bldg.
Stillwater, OK 74074
(405) 624-4448

Federal Bldg, Room 1640
1220 S.W. Third Avenue
Portland, OR 97204
(503) 326-2794

One Credit Union Place
Suite 340
Harrisburg, PA 17710-2993
(717) 782-3889

150 Carlos A. Chardon Ave.
Hato Rey, PR 00918-7013
(809) 766-5206

60 Quaker Lane
West Warwick, RI 02886
(401) 828-1300

1835 Assembly Street
Room 950
Strom Thurmond Fed.l Bldg.
Columbia, SC 29201
(803) 253-3896

Federal Building
200 4th Street S.W.
Huron, SD 57350-2475
(603) 353-1810

675 Estes Kefauver,
Fed. Bldg.-USCH
801 Broadway
Nashville, TN 37203
(615) 736-5476

W. R. Poage Federal Bldg.
101 S. Main Street
Temple, TX 76501-7682
(817) 774-1261

Wallace F. Bennett
Federal Bldg., Room 4402
125 So. State Street
Salt Lake City, UT 84138
(801) 524-5064

Federal Building, Rm. 9201
400 North 8th Street
Richmond, VA 23240-9999
(804) 287-1646

69 Union Street
Winooski, VT 05404
(802) 951-6795

Rock Pointe Tower II
Suite 450
W. 316 Boone Avenue
Spokane, WA 99201-2348
(509) 353-2339

6515 Watts Road, Suite 200
Madison, WI 53719-2726
(608) 264-5589

75 High Street, Room 301
Morgantown, WV 26505

Distribution

Source

(304) 291-4484

Federal Office Bldg.
100 East B Street, Rm. 3124
Casper, WY 82601
(307) 261-5208

The State Soil Geographic (STATSGO) data base is archived and distributed from the NRCS National Cartography and GIS Center in Fort Worth, Texas. Information requests may be directed to the following address:

National Cartography and GIS Center
U.S. Department of Agriculture
Natural Resources Conservation Service
501 Felix Street, Building 23
Fort Worth, TX 76115-3495
or
P.O. Box 6567
Fort Worth, TX 76115-0567

Phone (817) 334-5559
FAX (817) 334-5469

Format

Order requests are to be directed to:
Phone (800) 672-5559
FAX (817) 334-5469

The STATSGO spatial data are available in modified USGS Digital Line Graph (DLG-3) optional and ARC/INFO export file formats which are described in the section, Data structure. The spatial data are also available in GRASS, Version 4.13 format and in ARC/INFO, Version 7 coverages.

The STATSGO attribute data are available in ASCII table or ARC/INFO export formats that are described in the section, Data structure. The attribute data are also available in INFO table format when ordering ARC/INFO coverages.

Media

The NRCS National Cartography and GIS Center operates a Geographic Resource Analysis Support System (GRASS) Geographic Information System (GIS) and an ARC/INFO GIS. GRASS. Other software formats may be made available by mutual agreement.

Ordering Information

The STATSGO spatial and attribute data are distributed as one data set as a state-wide coverage. CD-ROMs have data for the 48 conterminous States, Hawaii, and Puerto Rico.

The distribution medium for STATSGO data is normally CD-ROM. However, data can also be provided on 8mm or 1/4 cartridge tapes. Please call the National Cartography and GIS Center for pricing and data format information.

Before ordering STATSGO data, the user needs to identify the State(s) of interest. Additional information and costs may be obtained from the National Cartography and GIS Center.

References

The STATSGO data are periodically updated, data files are dated, and users are responsible for obtaining the latest version.

[1] Bliss, N.B., and W.U. Reybold. 1989. Small-scale digital soil maps for interpreting natural resources. J. Soil and Water Cons. Jan.-Feb., pp. 30-34.

[2] Elissal, A.A., and V.M. Caruso. 1983. Digital elevation models. Circ. 895-B. U.S. Geol. Surv., Reston, VA.

[3] U.S. Department of Agriculture. 1993. National Soil Survey Handbook, Title 430–VI. Soil Surv. Staff, Soil Conserv. Serv.,

[4] U.S. Department of Agriculture. 1993. Soil Survey Manual. Soil Surv. Staff, U.S. Dep. Agric. Handb. 18.

[5] U.S. Department of Agriculture. 1975. Soil Taxonomy: A basic system of soil classification for making and interpreting soil surveys. Soil Conserv. Serv., U.S. Dep. Agric. Handb. 436.

[6] U.S. Department of Agriculture. 1981. Land resource regions and major land resource areas of the United States. U.S. Dep. Agric. Handb. 296.

[7] U.S. Department of Agriculture and Iowa State University Statistical Laboratory. 1987. Basic Statistics 1982 National Resources Inventory. Statistical Bulletin No. 756.

[8] U.S. Geological Survey. 1987. Digital line graphs from 1:2,000,000-scale maps. Data Users Guide 3. Reston, VA.

Appendixes

Appendix A: INFO datafile structures

DATAFILE NAME: COMP (292) 8/14/1991

53 ITEMS: STARTING IN POSITION 1

COL	ITEM NAME	WDTH	OPUT	TYP	N.DEC	ALTERNATE NAME
1	STSSAID	5	5	C	-	
6	MUID	7	7	C	-	
13	SEQNUM	2	2	I	-	
15	MUSYM	5	5	C	-	
20	COMPNAME	30	30	C	-	
50	S5ID	6	6	C	-	
56	COMPPCT	3	3	I	-	
59	SLOPEL	2	2	I	-	
61	SLOPEH	2	2	I	-	
63	SURFTEX	8	8	C	-	
71	OTHERPH	40	40	C	-	
111	COMPKIND	1	1	C	-	
112	COMPACRE	6	6	I	-	
118	CLASCODE	20	20	C	-	
138	ANFLOOD	5	5	C	-	
143	ANFLODUR	12	12	C	-	
155	ANFLOBEG	3	3	C	-	
158	ANFLOEND	3	3	C	-	
161	GSFLOOD	5	5	C	-	
166	GSFLODUR	12	12	C	-	
178	GSFLOBEG	3	3	C	-	
181	GSFLOEND	3	3	C	-	
184	WTDEPL	4	4	N	1	
188	WTDEPH	4	4	N	1	
192	WTKIND	5	5	C	-	
197	WTBEG	3	3	C	-	
200	WTEND	3	3	C	-	
203	PNDDEPL	4	4	N	1	
207	PNDDEPH	4	4	N	1	
211	PNDDUR	10	10	C	-	
217	PNDBEG	3	3	C	-	
220	PNDEND	3	3	C	-	
223	ROCKDEPL	2	2	I	-	
225	ROCKDEPH	2	2	I	-	
227	ROCKHARD	4	4	C	-	
231	PANDEPL	2	2	I	-	
233	PANDEPH	2	2	I	-	
235	PANHARD	5	5	C	-	
240	SUBINITL	2	2	I	-	
242	SUBINITH	2	2	I	-	
244	SUBTOTL	2	2	I	-	
246	SUBTOTH	2	2	I	-	
248	HYDGRP	3	3	C	-	
251	FROSTACT	8	8	C	-	
259	DRAINAGE	5	5	C	-	
264	HYDRIC	1	1	C	-	
265	CORCON	8	8	C	-	
273	CORSTEEL	8	8	C	-	

281	CLNIRR	1	1	C	-
282	CLIRR	1	1	C	-
283	SCLNIRR	2	2	C	-
285	SCLIRR	2	2	C	-
287	PRIMFML	2	2	C	-

DATAFILE NAME: **COMPYLD** (60) 8/14/1991

6 ITEMS: STARTING IN POSITION 1

COL	ITEM NAME	WDTH	OPUT	TYP	N.DEC	ALTERNATE NAME
1	STSSAID	5	5	C	-	
6	MUID	7	7	C	-	
13	SEQNUM	2	2	I	-	
15	CROPNAME	30	30	C	-	
45	NIRRYLD	8	8	N	1	
53	IRRYLD	8	8	N	1	

DATAFILE NAME: **FOREST** (24) 8/14/1991

5 ITEMS: STARTING IN POSITION 1

COL	ITEM NAME	WDTH	OPUT	TYP	N.DEC	ALTERNATE NAME
1	STSSAID	5	5	C	-	
6	MUID	7	7	C	-	
13	SEQNUM	2	2	I	-	
15	PLANTSYM	7	7	C	-	
22	PLANTCOV	3	3	I	-	

DATAFILE NAME: **INTERP** (24) 8/14/1991

8 ITEMS: STARTING IN POSITION 1

COL	ITEM NAME	WDTH	OPUT	TYP	N.DEC	ALTERNATE NAME
1	SSTSSAID	5	5	C	-	
6	MUID	7	7	C	-	
13	SEQNUM	2	2	I	-	
15	GRPCODE	2	2	C	-	
17	RATING	2	2	C	-	
19	RESTCT1	2	2	C	-	
21	RESTCT2	2	2	C	-	
23	RESTCT3	2	2	C	-	

DATAFILE NAME: **LAYER** (240) 12/14/1991

63 ITEMS: STARTING IN POSITION 1

COL	ITEM NAME	WDTH	OPUT	TYP	N.DEC	ALTERNATE NAME
1	STSSAID	5	5	C	-	
6	MUID	7	7	C	-	
13	SEQNUM	2	2	I	-	
15	S5ID	6	6	C	-	
21	LAYERNUM	1	1	I	-	
22	LAYERID	2	2	I	-	
24	LAYDEPL	2	2	I	-	
26	LAYDEPH	2	2	I	-	
28	TEXTURE1	8	8	C	-	
36	TEXTURE2	8	8	C	-	
44	TEXTURE3	8	8	C	-	
52	KFACT	4	4	N	2	
56	KFFACT	4	4	N	2	

60	TFACT	3	3	C	-
63	WEG	2	2	C	-
65	INCH10L	2	2	I	-
67	INCH10H	2	2	I	-
69	INCH3L	2	2	I	-
71	INCH3H	2	2	I	-
73	NO4L	3	3	I	-
76	NO4H	3	3	I	-
79	NO10L	3	3	I	-
82	NO10H	3	3	I	-
85	NO40L	3	3	I	-
88	NO40H	3	3	I	-
91	NO200L	3	3	I	-
93	NO200H	3	3	I	-
96	CLAYL	2	2	I	-
98	CLAYH	2	2	I	-
100	LLL	3	3	I	-
103	LLH	3	3	I	-
106	PIL	3	3	I	-
109	PIH	3	3	I	-
112	UNIFIED1	5	5	C	-
117	UNIFIED2	5	5	C	-
122	UNIFIED3	5	5	C	-
127	UNIFIED4	5	5	C	-
132	AASHTO1	5	5	C	-
137	AASHTO2	5	5	C	-
142	AASHTO3	5	5	C	-
147	AASHTO4	5	5	C	-
152	AASHIND	4	4	N	1
156	AWCL	4	4	N	2
160	AWCH	4	4	N	2
164	BDL	4	4	N	2
168	BDH	4	4	N	2
172	OML	4	4	N	1
176	OMH	4	4	N	1
180	PHL	4	4	N	1
184	PHH	4	4	N	1
188	SALINL	2	2	I	-
190	SALINH	2	2	I	-
192	SARL	5	5	N	1
196	SARH	5	5	N	1
200	CECL	5	5	N	1
204	CECH	5	5	N	1
209	CACO3L	2	2	I	-
211	CACO3H	2	2	I	-
213	GYPSUML	2	2	I	-
215	GYPSUMH	2	2	I	-
217	PERML	5	5	N	2
222	PERMH	5	5	N	2
227	SHRINKSW	10	10	C	-

DATAFILE NAME: **MAPUNIT** (142) 8/14/1991

9 ITEMS: STARTING IN POSITION 1

COL	ITEM NAME	WDTH	OPUT	TYP	N.DEC	ALTERNATE NAME
1	STSSAID	5	5	C	-	
6	SSAID	3	3	C	-	

9	MUSYM	5	5	C	-	
14	MUID	7	7	C	-	
21	MUNAME	109	109	C	-	
130	MUKIND	1	1	C	-	
131	MLRA	4	4	C	-	
135	PRIMFML	2	2	C	-	
137	MUACRES	6	6	I	-	

DATAFILE NAME: **PLANTCOM** (24) 8/14/1991

5 ITEMS: STARTING IN POSITION 1

COL	ITEM NAME	WDTH	OPUT	TYP	N.DEC	ALTERNATE NAME
1	STSSAID	5	5	C	-	
6	MUID	7	7	C	-	
13	SEQNUM	2	2	I	-	
15	PLANTSYM	7	7	C	-	
22	PLANTPCT	3	3	C	-	

DATAFILE NAME: **PLANTNM** (98) 8/14/1991

3 ITEMS: STARTING IN POSITION 1

COL	ITEM NAME	WDTH	OPUT	TYP	N.DEC	ALTERNATE NAME
1	PLANTSYM	7	7	C	-	
8	SCINAME	60	60	C	-	
68	COMNAME	31	31	C	-	

DATAFILE NAME: **RSPROD** (88) 8/14/1991

8 ITEMS: STARTING IN POSITION 1

COL	ITEM NAME	WDTH	OPUT	TYP	N.DEC	ALTERNATE NAME
1	STSSAID	5	5	C	-	
6	MUID	7	7	C	-	
13	SEQNUM	2	2	I	-	
15	RSID	8	8	C	-	
23	RSNAME	51	51	C	-	
74	PRODFAV	5	5	I	-	
79	PRODNORM	5	5	I	-	
84	PRODUNFV	5	5	I	-	

DATAFILE NAME: **TAXCLASS** (164) 8/14/1991

11 ITEMS: STARTING IN POSITION 1

COL	ITEM NAME	WDTH	OPUT	TYP	N.DEC	ALTERNATE NAME
1	CLASCODE	20	20	C	-	
21	CLASS	120	120	C	-	
141	ORDER	1	1	C	-	
142	SUBORDER	3	3	C	-	
145	GRTGROUP	5	5	C	-	
150	SUBGROUP	4	4	C	-	
154	PARTSIZE	3	3	C	-	
157	MINALOGY	2	2	C	-	
159	REACTION	2	2	C	-	
161	SOILTEMP	2	2	C	-	
163	OTHERFAM	2	2	C	-	

DATAFILE NAME: **WINDBRK** (24) 8/14/1991

5 ITEMS: STARTING IN POSITION 1

COL	ITEM NAME	WDTH	OPUT	TYP	N.DEC	ALTERNATE NAME
1	STSSAID	5	5	C	-	
6	MUID	7	7	C	-	
13	SEQNUM	2	2	I	-	
15	PLANTSYM	7	7	C	-	
22	WNDBRKHT	3	3	I	-	

DATAFILE NAME: **WLHABIT** (122) 8/14/1991

15 ITEMS: STARTING IN POSITION 1

COL	ITEM NAME	WDTH	OPUT	TYP	N.DEC	ALTERNATE NAME
1	STSSAID	5	5	C	-	
6	MUID	7	7	C	-	
13	SEQNUM	2	2	I	-	
15	WLGRAIN	9	9	C	-	
24	WLGRASS	9	9	C	-	
33	WLHERB	9	9	C	-	
42	WLHARD	9	9	C	-	
51	WLCONIF	9	9	C	-	
60	WLSHRUB	9	9	C	-	
69	WLWETPLT	9	9	C	-	
78	WLSHLWAT	9	9	C	-	
87	WLOPEN	9	9	C	-	
96	WLWOOD	9	9	C	-	
105	WLWET	9	9	C	-	
114	RLRANGE	9	9	C	-	

DATAFILE NAME: **WOODLAND** (28) 8/14/1991

7 ITEMS: STARTING IN POSITION 1

COL	ITEM NAME	WDTH	OPUT	TYP	N.DEC	ALTERNATE NAME
1	STSSAID	5	5	C	-	
6	MUID	7	7	C	-	
13	SEQNUM	2	2	I	-	
15	SUITCODE	2	2	C	-	
17	PLANTSYM	7	7	C	-	
24	SITIND	3	3	I	-	
27	WOODPROD	2	2	I	-	

DATAFILE NAME: **WOODMGT** (58) 8/14/1991

9 ITEMS: STARTING IN POSITION 1

COL	ITEM NAME	WDTH	OPUT	TYP	N.DEC	ALTERNATE NAME
1	STSSAID	5	5	C	-	
6	MUID	7	7	C	-	
13	SEQNUM	2	2	I	-	
15	ORDSYM	3	3	C	-	
18	WDEROSN	8	8	C	-	
26	WDEQUIP	8	8	C	-	
34	WDSEED	8	8	C	-	
42	WDWIND	8	8	C	-	
50	WDPLANT	9	9	C	-	

DATAFILE NAME: **YLDUNITS** 40) 8/14/1991

2 ITEMS: STARTING IN POSITION 1

COL	ITEM NAME	WDTH	OPUT	TYP	N.DEC	ALTERNATE NAME
1	CROPNAME	31	31	C	-	
32	YLDUNITS	9	9	C	-	

Appendix B: Definition of soil data elements

Element	Tables	Long name	Description
aashind	layer	AASHTO Group Index	AASHTO (American Assoc. of State Highway and Transportation Officials) group index. A modification to AASHTO group classification of a soil.
aashto	layer	AASHTO Group Classification	AASHTO (American Assoc. of State Highway and Transportation Officials) group classification. A code for AASHTO group classification for a soil.
anflobeg	comp	Annual Flooding Month Begin	Month in which annual flooding (flooding likely to occur during the year) begins in a normal year.
anflodur	comp	Flood Duration Class	The duration of annual flooding in a normal year.
anfloend	comp	Annual Flooding Month End	Month in which annual flooding (flooding likely to occur during the year) ends in a normal year.
anflood	comp	Annual Flooding Frequency	Descriptive term used to describe the frequency of annual flooding (flooding likely to occur during the year) that is likely to occur. Frequent (FREQ) - > 50% chance of flooding; Occasional (OCCAS) - 5-50% chance of flooding; Rare (RARE) - 0-5% chance of flooding.
awch	layer	Available Water Capacity	Maximum value for the range of available water capacity for the soil layer or horizon, expressed as inches/inch.
awcl	layer	Available Water Capacity	Minimum value for the range of available water capacity for the soil layer or horizon, expressed as inches/inch.
bdh	layer	Bulk Density	Maximum value for the range in moist bulk density of the soil layer or horizon, expressed as grams per cubic centimeter.
bd	llayer	Bulk Density	Minimum value for the range in moist bulk density of the soil layer or horizon, expressed as grams per cubic centimeter.
caco3h	layer	Carbonate as $CaCO_3$	Maximum value for the range of calcium carbonate ($CaCO_3$) in the soil layer or horizon, expressed as a percent.

Element	Tables	Long name	Description
caco3l	layer	Carbonate as $CaCO_3$	Minimum value for the range of calcium carbonate ($CaCO_3$) in the soil layer or horizon, expressed as a percent.
cech	layer	Cation Exchange Capacity	Maximum value for the range in cation exchange capacity for the soil layer or horizon.
cecl	layer	Cation Exchange Capacity	Minimum value for the range in cation exchange capacity for the soil layer or horizon.
clascode	comp taxclass	Taxonomic Classification code	Code for the taxonomic classification for the soil. Definition of codes are in the taxclass table.
class	taxclass	Taxonomic Classification	The taxonomic classification (name) of the soil.
clayh	layer	Clay	Maximum value for the range in clay content of the soil layer or horizon, expressed as a percentage of the material less than 2 mm in size.
clayl	layer	Clay	Minimum value for the range in clay content of the soil layer or horizon, expressed as a percentage of the material less than 2 mm in size.
clirr	comp	Irrigated Capability Class	Irrigated Capability Class. A rating of the soil for irrigated agricultural use. The number indicates progressively greater limitations and narrower choices for use.
clnirr	comp	Nonirrigated Capability Class	A rating of the soil for nonirrigated agricultural use. The number indicates progressively greater limitations and narrower choices for use.
code	codes	Data base code	A listing of codes used in the specified data base.
codedesc	codes	Code Description or Meaning	Narrative description or explanation of codes used in the data base.
codename	codes	Code Name	The long name (unabbreviated) for the code.
col	element tblelt valrange	Column Name	Column name used in data base.
comname	plantnm	Plant Common Name	The common name for the plant most widely used by the state.
compacre	comp	Component Acres	The acreage of the component of a soil map unit. Component acres are normalized to 100 percent to exclude inclusions. The sum of all the component acres for a map unit will equal 100 percent.
compkind	comp	Kind of Component	Code identifying the kind of component of the map unit. Example: Series (S); Family (F); Variant (V); Taxadjunct (T); Taxon above family (G); Miscellaneous area (M).

Element	Tables	Long name	Description
compname	comp	Component Name	The name of the component (series, taxonomic unit or miscellaneous area) of the map unit.
comppct	comp	Component Percent	The percentage of the component of the map unit.
corcon	comp	Corrosion - Concrete	An interpretation rating of the susceptibility of concrete to corrosion when in contact with the soil.
corsteel	comp	Corrosion - Uncoated Steel	An interpretation rating of the susceptibility of uncoated steel to corrosion when in contact with the soil.
cropname	compyld yldunits	Crop Name	The common name for the crop for which a yield is given.
domid	codes element	Domain ID	A code identifying the domain for the data element. Domain contains the broad definition and codes used for all data elements within its domain.
drainage	comp	Soil Drainage Class	Code identifying the natural drainage condition of the soil and refers to the frequency and duration of periods when the soil is free of saturation. Example: Well Drained (W); Excessive (E); Moderately Well (MW); Poorly (P); Somewhat Excessively (SE); Somewhat Poorly (SP).
eldesc	element	Element Description	The characteristics or properties that define or describe an element.
ellable	element	Element Label - long name	The long name assigned to an element.
frostact	comp	Potential Frost Action	An interpretation rating of the susceptibility of the soil to frost heaving.
grpcode	interp	Interpretative Group Code	Code identifying the interpretative group or category for the interpretation specified. Examples of interpretative groups are septic tank absorption fields and shallow excavations.
grtgroup	taxclass	Great Group	Code for the taxonomic GREAT GROUP category.
gsflobeg	comp	Growing Season Flooding Begins	Month in which growing season (season for common field crops in the area) flooding begins in a normal year.
gsflodur	comp	Growing Season Duration	The duration of flooding during the growing season (season for common field crops in the area).
gsfloend	comp	Growing Season Flooding Ends	Month in which growing season (season for common field crops in the area) flooding ends in a normal year.
gsflood	comp	Growing Season Flooding Frequency	Descriptive term describing the frequency of flooding during the growing season (season for the common field crops in the area). Frequent (FREQ); Occasional (OCCAS); Rare (RARE).

Element	Tables	Long name	Description
gypsumh	layer	Gypsum	Maximum value for the range in sulfates reported as gypsum ($CaSO_4$) in the soil layer or horizon, expressed as a percent.
gypsuml	layer	Gypsum	Minimum value for the range in sulfates reported as gypsum ($CaSO_4$) in the soil layer or horizon, expressed as a percent.
hydgrp	comp	Hydrologic Group	The hydrologic group for the soil. Example: A, A/D.
hydric	comp	Hydric Soil Rating	The symbol (Y/N) identifying hydric soils.
inch10h	layer	Weight Percent Greater than 10 inches	The maximum value for the range in percent by weight of the rock fragments greater than 10 inches size in the soil layer or horizon.
inch10l	layer	Weight Percent Greater than 10 inches	The minimum value for the range in percent by weight of the rock fragments greater than 10 inches size in the soil layer or horizon.
inch3h	layer	Weight Percent 3 to 10 inches	The maximum value for the range in percent by weight of the rock fragments 3 to 10 inches size in the soil layer or horizon.
inch3l	layer	Weight Percent 3 to 10 inches	The minimum value for the range in percent by weight of the rock fragments 3 to 10 inches size in the soil layer or horizon.
irryld	compyld	Irrigated Crop Yield	The expected yield of the specific crop with irrigation. Defined as the yield expected in an average year under a high level of management.
kfact	layer	Soil Erodibility Factor, includes rock fragments	An erodibility factor which is adjusted for the effect of rock fragments.
kffact	layer	Soil Erodibility Factor, rock fragments free	An erodibility factor which quantifies the susceptibility of soil particles to detachment and movement by water. This factor is used in the Universal Soil Loss Equation to calculate soil loss by water.
laydeph	layer	Layer Depth	The depth to the lower boundary of the soil layer or horizon, expressed in inches.
laydepl	layer	Layer Depth	Depth to the upper boundary of the soil layer or horizon, expressed in inches.
layerid	layer	Layer Identification Number	A convention to identify the original layers on the SOI-5 record. Example: layerid 11 for the first surface of a multisurface record, 12 for the second surface layer, 2 thru 9 for subsurface layers.

Element	Tables	Long name	Description
layernum	layer	Layer Number	The sequence number identifying layers in the soil profile. A layer number of 1 would indicate the layer is the surface layer.
len	valrange	Column Length	The maximum length of a column.
llh	layer	Liquid Limit	The maximum value for the range in liquid limit of the soil layer or horizon, expressed as percent moisture by weight.
lll	layer	Liquid Limit	The minimum value for the range in liquid limit of the soil layer or horizon, expressed as percent moisture by weight.
minalogy	taxclass	Mineralogy	Code for the MINERALOGY class of the Family category of taxonomic classification.
mlra	mapunit	Major Land Resource Area	The code used to identify the dominant Major Land Resource Area (MLRA) within which the soil map unit is mapped.
muacres	mapunit	Mapunit Acres	The acreage of the soil map unit in the soil survey area.
muid	comp compyld forest interp layer mapunit plantcom rsprod windbrk wlhabit woodland woodmgt	Mapunit Identification Symbol	A symbol that consists of the state alpha symbol FIPS code and a three digit Arabic number. It uniquely identifies a map unit within a state. For example, KS001. The muid is used as a key for linking information in the MUIR tables.
mukind	mapunit	Mapunit Kind	Code identifying the kind of map unit: Consociation (C); Association (A); Undifferentiated Group (U); Complex (X).
muname	mapunit	Mapunit Name	Correlated name of the map unit (recommended name or field name for surveys in progress).
musym	mapunit comp	Mapunit Symbol	The symbol used to identify the soil map unit on the soil map.
nirryld	compyld	Nonirrigated Crop Yield	The expected yield of the specific crop without supplemental irrigation. Defined as the yield expected in an average year under a high level of management.
no10h	layer	Percent Passing Sieve Number 10	The maximum value for the range in percent by weight of the soil material in a layer or horizon which is less than 3 inches in size and passes a no. 10 sieve.

Element	Tables	Long name	Description
no10l	layer	Percent Passing Sieve Number 10	The minimum value for the range in percent by weight of the soil material in a layer or horizon which is less than three inches in size and passes a no. 10 sieve.
no200h	layer	Percent Passing Sieve Number 200	The maximum value for the range in percent by weight of the soil material in a layer or horizon which is less than 3 inches in size and passes a no. 200 sieve.
no200l	layer	Percent Passing Sieve Number 200	The minimum value for the range in percent by weight of the soil material in a layer or horizon which is less than 3 inches in size and passes a no. 200 sieve.
no40h	layer	Percent Passing Sieve Number 40	The maximum value for the range in percent by weight of the soil material in a layer or horizon which is less than 3 inches in size and passes a no. 40 sieve.
no40l	layer	Percent Passing Sieve Number 40	The minimum value for the range in percent by weight of the soil material in a layer or horizon which is less than 3 inches in size and passes a no. 40 sieve.
no4h	layer	Percent Passing Sieve Number 4	The maximum value for the range in percent by weight of the soil material in a layer or horizon which is less than 3 inches in size and passes a no. 4 sieve.
no4l	layer	Percent Passing Sieve Number 4	The minimum value for the range in percent by weight of the soil material in a layer or horizon which is less than 3 inches in size and passes a no. 4 sieve.
omh	layer	Organic Matter	The maximum value for the range in organic matter content of the soil layer or horizon, expressed in percent by weight.
oml	layer	Organic Matter	The minimum value for the range in organic matter content of the soil layer or horizon, expressed in percent by weight.
order	taxclass	Order	Code for the taxonomic ORDER category of the record.

Element	Tables	Long name	Description
ordsym	woodmgt	Ordination Symbol	The ordination symbol is the class and subclass part of the woodland suitability group. The first element in ordination symbol is the productivity class. This is a number that denotes potential productivity in cubic meters of wood per hectare per year for an indicator tree (1 m^3/ha is equal to 14.3 ft^3/ac.). The second part of the ordination is the subclass, a capital letter symbol which indicates certain soil or physiographic characteristics that contribute to important hazards or limitations in management. Example: W - Excessive wetness. Subclasses are listed in ranked order.
otherfam	taxclass	Other Family	This field consists of OTHER FAMILY codes for soil depth class, slope class, consistence class, classes of coatings and classes of cracks of the Family category of taxonomic classification.
otherph	comp	Class-Determining Criteria	Phase Class-determining phase criteria, other than slope and texture, recorded on the SOI-6 and used to select appropriate interpretation and rating from the SOI-5 Record.
pandeph	comp	Depth to Cemented Pan	Maximum value for the range in depth to the upper boundary of a cemented pan, expressed in inches.
pandepl	comp	Depth to Cemented Pan	Minimum value for the range in depth to the upper boundary of a cemented pan, expressed in inches.
panhard	comp	Cemented Pan Thickness	The degree of induration and thickness of the cemented pan. A pan is rated as “THICK” if it is more than 3 inches thick and continually indurated or more than 18 inches thick and discontinuous or fractured. Pans not meeting these criteria are rated THIN.
partsize	taxclass	Particle Size	Code for the PARTICLE-SIZE class of the Family category of taxonomic classification.
permh	layer	Permeability Rate	The maximum value for the range in permeability rate for the soil layer or horizon, expressed as inches/hour.
perml	layer	Permeability Rate	The minimum value for the range in permeability rate for the soil layer or horizon, expressed as inches/hour.
phh	layer	Soil Reaction (pH)	The maximum value for the range in soil reaction (pH) for the soil layer or horizon.

Element	Tables	Long name	Description
phl	layer	Soil Reaction (pH)	The minimum value for the range in soil reaction (pH) for the soil layer or horizon.
pih	layer	Plasticity Index	The maximum value for the range in plasticity index for the soil layer or horizon, expressed as percent of moisture by weight.
pil	layer	Plasticity Index	The minimum value for the range in plasticity index for the soil layer or horizon, expressed as percent of moisture by weight.
plantcov	forest	Plant Ground Cover	The percentage of the ground covered by the plant (forest understory).
plantpct	plantcom	Plant Production Percentage	The percentage of total site production attributed to the specified plant, expressed as percent of air dry plant material weight.
plantsym	forest plantcom plantnm windbrk woodland	Plant Symbol	Symbol used to identify a specific plant.
pndbeg	comp	Ponding Begin	Month in which soil surface ponding begins in a normal year.
pnddeph	comp	Ponding Depth	The maximum value for the range in depth of surface water ponding on the soil.
pnddepl	comp	Ponding Depth	The minimum value for the range in depth of surface water ponding on the soil.
pnddur	comp	Ponding Duration	The duration of surface water ponding.
pndend	comp	Ponding End	Month in which surface water ponding ends in a normal year.
prec	valrange	Precision Value	The number of digits to the right of a decimal.
primfml	comp mapunit	Prime Farmland Classification	The prime farmland classification of the map unit. State codes have been developed for some states.
prodfav	rsprod	Range Production Favorable	The estimated annual potential production of range forage for the soil in a year with favorable or above average growing conditions. Round to nearest 100 pounds.
prodnorm	rsprod	Range Production Normal	The estimated annual potential production of range forage for the soil in a year with normal or average growing conditions. Round to nearest 100 pounds.

Element	Tables	Long name	Description
produnfv	rsprod	Range Production Unfavorable	The estimated annual potential production of range forage for the soil in a year with unfavorable or below average growing conditions. Round to nearest 100 pounds.
rangeh	valrange	High Range	The maximum value for the range in values of an element.
rangel	valrange	Low Range	The minimum value for the range in values of an element.
rating	interp	Soil Interpretative Rating	Rating of soil for specified use. Suitability ratings are good, fair, and poor. Limitation ratings are slight, moderate, and severe.
reaction	taxclass	Reaction	Code for the REACTION class of the Family category of taxonomic classification.
restct1	interp	Rating Limitation Restrictions	Restrictive feature code, 1st.
restct2	interp	Rating Limitation Restrictions	Restrictive feature code, 2nd.
restct3	interp	Rating Limitation Restrictions	Restrictive feature code, 3rd.
rockdeph	comp	Depth to Bedrock	The maximum value for the range in depth to bedrock, expressed in inches.
rockdepl	comp	Depth to Bedrock	The minimum value for the range in depth to bedrock, expressed in inches.
rockhard	comp	bedrock hardness	The degree of hardness of the underlying rock. Rated as: HARD - Excavation requires blasting or special equipment or SOFT - Excavation can be made with trenching machines, backhoes, or small rippers.
rsid	rsprod	Range Site Identification	Code used to identify the NRCS range site.
rsname	rsprod	Range Site Name	Name for the NRCS range site.
s5id	comp layer	Soil Interpretations Record Number	The Soil Interpretations Record (SOI-5) identification number assigned to the particular SOI-5. Example: CO0034.
salinh	layer	Salinity	The maximum value for the range in soil salinity of the soil layer or horizon measured as electrical conductivity of the soil in a saturated paste. Values are expressed in mmhos/cm.
salinl	layer	Salinity	The minimum value for the range in soil salinity of the soil layer or horizon measured as electrical conductivity of the soil in a saturated paste. Values are expressed in mmhos/cm.

Element	Tables	Long name	Description
sarh	layer	Sodium Absorption Ratio	The maximum value for the range in Sodium Absorption Ratio (SAR) for the soil layer or horizon.
sarl	layer	Sodium Absorption Ratio	The minimum value for the range in Sodium Absorption Ratio (SAR) for the soil layer or horizon.
sciname	plantnm	Scientific Plant Name	The scientific name of a plant.
sclirr	comp	Irrigated Capability Subclass	Irrigated Capability Subclass. Concatenation of capability class and subclass codes: Example: class 2 and subclass e are combined and entered as 2E.
sclnirr	comp	Nonirrigated Capability Subclass	Nonirrigated Capability Subclass. Concatenation of capability class and subclass codes. Example: class 2 and subclass e are combined and entered as 2E.
seqnum	comp compyld forest interp layer plantcom rsprod windbrk wlhabit woodland woodmgt	Sequence Number	A number identifing the sequence of components in a map unit. The first component of a multitaxa map unit has a seqnum of 1, the second component 2, and so on.
shrinksw	layer	Shrink-Swell Potential	An interpretation rating of the soil layer or horizons behavior of changing volume (shrinking and swelling) upon wetting and drying.
sitind	woodland	Site Index	The height in feet of the larger trees at some given age, normally 100 years in the western U.S., and 50 years in the east. The pinyon-juniper forest type is an exception, where the site index is determined by basal area.
slopeh	comp	Soil Slope	The maximum value for the range of slope of a soil component within a map unit.
slopel	comp	Slope of Soil	The minimum value for the range of slope of a soil component within a map unit.
soiltemp	taxclass	Soil Temperature	Code for the SOIL TEMPERATURE class of the Family category of taxonomic classification.
ssaid	mapunit	Soil Survey Symbol	Three character numeric code which identifies the soil survey area. For survey areas covering a single county the ssaid is the county FIPS code. For multicounty survey areas the ssaid is identified in the Soil Survey Schedule. Example: 617,...012.

Element	Tables	Long name	Description
stssaid	comp compyld forest interp layer mapunit plantcom rsprod windbrk wlhabit woodland woodmgt	State Soil Survey Area ID	A concatenation of FIPS alpha code for a state and the soil survey area symbol (ssaid). Example: CO017.
subgroup	taxclass	Subgroup	Code for the taxonomic SUBGROUP category of the record.
subinith	comp	Initial Subsidence	Maximum value for the range in initial subsidence that can be expected when drained, expressed in inches (organic soils only).
subinitl	comp	Initial Subsidence	Minimum value for the range in initial subsidence that can be expected when drained, expressed in inches (organic soils only).
suborder	taxclass	Suborder	Code for the taxonomic SUBORDER category of the record.
subtoth	comp	Total Subsidence	Maximum value for the range in total subsidence that can be expected when drained, expressed in inches (organic soils only).
subtotl	comp	Total Subsidence	Minimum value for the range in total subsidence that can be expected when drained, expressed in inches (organic soils only).
suitcode	woodland	Woodland Tree Suitability	Code indicating if the tree is common to the site; Existing (E), or a tree which could be planted as a tree crop; Potential (P). Trees which are both existing and have a potential for planting are giving a dual code (EP).
surftex	comp	Surface Soil Texture	Code for the USDA texture for the surface layer or horizon. Example: Loam (L); Sandy loam (SL). Also includes terms used to modify texture and terms used in lieu of texture.
table	table element tblelt valrange	Table Name	Data dictionary - Identifies the short name used to identify the table in the data base.
texture	layer	Soil Texture Class	Code for the USDA texture for the specified layer or horizon of the soil. Example: Sandy Loam (SL); Loam (L). Also includes terms used to modify texture and terms used in lieu of texture.

Element	Tables	Long name	Description
tfact	layer	T Factor	Soil loss tolerance factor. The maximum rate of soil erosion that will permit a high level of crop production.
unified	layer	Unified Soil Classification	The Unified soil classification. An engineering classification of soils.
wdequip	woodmgt	Woodland Equipment	Woodland limitation rating for the use of equipment, year round or seasonal.
wderosn	woodmgt	Woodland Erosion	Woodland limitation rating identifying the probability that damage may occur as a result of site preparation and following cutting operations where soil is exposed.
wdplant	woodmgt	Woodland Plant Competition	Woodland limitation rating for the likelihood of the invasion or growth of undesirable species when openings are made in the canopy.
wdseed	woodmgt	Woodland Seeding Mortality	Woodland limitation rating identifying the probability of death of naturally occurring or planted tree seedlings as influenced by kinds of soil or topographic conditions.
wdwind	woodmgt	Woodland Windthrow Hazard	Woodland limitation rating identifying the windthrow hazard. Windthrow is the likelihood of trees being uprooted by wind as a result of insufficient depth of the soil to give adequate root anchorage.
weg	layer	Wind Erodibility Group	The wind erodibility group (weg) assigned to the soil layer or horizon.
wei	layer	Wind erodibility index	The wind erodibility index assigned to the soil layer or horizon.
wlconif	wlhabit	Wildlife Habitat Element (coniferous trees)	Suitability of the soil to produce the wildlife habitat element coniferous trees.
wlgrain	wlhabit	Wildlife Habitat Element (grain)	Suitability of the soil to produce the wildlife habitat element grain.
wlgrass	wlhabit	Wildlife Habitat Element (grass)	Suitability of the soil to produce the wildlife habitat element grass.
wlhard	wlhabit	Wildlife Habitat Element (hardwood trees)	Suitability of the soil to produce the wildlife habitat element hardwood trees.
wlherb	wlhabit	Wildlife Habitat Element (herbaceous plants)	Suitability of the soil to produce the wildlife habitat element herbaceous plants.
wlopen	wlhabit	Wildlife Habitat Potential (openland)	Suitability of the soil to produce the habitat requirements for openland wildlife.
wlrange	wlhabit	Wildlife Habitat Potential (rangeland)	Suitability of the soil to produce the habitat requirements for rangeland wildlife.

Element	Tables	Long name	Description
wlshlwat	wlhabit	Wildlife Habitat Element (shallow water)	Suitability of the soil to produce the habitat element shallow water.
wlshrub	wlhabit	Wildlife Habitat Element (shrubs)	Suitability of the soil to produce the wildlife habitat element shrubs.
wlwet	wlhabit	Wildlife Habitat Potential (wetland)	Suitability of the soil to produce the habitat requirements for wetland wildlife.
wlwetplt	wlhabit	Wildlife Habitat Element (wetland plants)	Suitability of the soil to produce the wildlife habitat element wetland plants.
wlwood	wlhabit	Wildlife Habitat Potential (woodland)	Suitability of the soil to produce the habitat requirements for woodland wildlife.
wndbrkht	windbrk	Windbreak Tree Height	Windbreak tree height in feet at age in 20 years.
woodprod	woodland	Production Class	Production class information for a specific tree measured in cubic meters per hectare per year (1 m^3/ha = 14.3 $ft.^3$/ac.).
wtbeg	comp	Water Table Begins	Month in which seasonal water table occurs at the depth specified in a normal year.
wtdeph	comp	Water Table Depth	Maximum value for the range in depth to the seasonally high water table during the months specified.
wtdepl	comp	Water Table Depth	Minimum value for the range in depth to the seasonally high water table during the months specified.
wtend	comp	Water Table Ends	Month in which seasonal water table subsides below the depth specified in a normal year.
wtkind	comp	Water Table Kind	The type of water table: Apparent (APPAR); Artesian (ARTES); Perched (PERCH).
yldunits	yldunits	Yield Units	The units used to record the yield for the specified crop.

Appendix C: Definition of soil data codes

Element	Code	Code Name	Code Description
aashto	A-1	Group Classification A-1	Granular materials (35% or less passing No. 200), Stone Fragments, Gravel and Sand.
aashto	A-1-A	Group Classification A-1-A	
aashto	A-1-B	Group Classification A-1-B	
aashto	A-2	Group Classification A-2	Granular materials (35% or less passing No. 200), Silty, or Clayey Gravel and Sand.
aashto	A-2-4	Group Classification A-2-4	
aashto	A-2-5	Group Classification A-2-5	
aashto	A-2-6	Group Classification A-2-6	
aashto	A-2-7	Group Classification A-2-7	
aashto	A-3	Group Classification A-3	Granular materials (35% or less passing No. 200), Fine Sand.
aashto	A-4	Group Classification A-4	Silt-Clay Materials (more than 35% passing No. 200), Silty Soils.
aashto	A-5	Group Classification A-5	Silt-Clay Materials (more than 35% passing No. 200), Silty Soils.
aashto	A-6	Group Classification A-6	Silt-Clay Materials (more than 35% passing No. 200), Clayey Soils.
aashto	A-7	Group Classification A-7	Silt-Clay Materials (more than 35% passing No. 200), Clayey Soils.
aashto	A-7-5	Group Classification A-7-5	
aashto	A-7-6	Group Classification A-7-6	
aashto	A-8	Group Classification A-8	
cl	1	Capability Class - I	Soils in Class I have few limitations that restrict their use.
cl	2	Capability Class - II	Soils in Class II have some limitations that reduce the choice of plants or require moderate conservation practices.
cl	3	Capability Class - III	Soils in Class III have severe limitations that reduce the choice of plants or require special conservation practices, or both.

Element	Code	Code Name	Code Description
cl	4	Capability Class - IV	Soils in Class IV have very severe limitations that restrict the choice of plants, require very careful management, or both.
cl	5	CapabilityClass - V	Soils in Class V have little or no erosion hazard but have other limitations impractical remove that limit their use.
cl	6	CapabilityClass - VI	Soils in Class VI have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture, etc.
cl	7	CapabilityClass - VII	Soils in Class VII have very severe limitations that make them unsuited to cultivation and that restrict their use to grazing, etc.
cl	8	CapabilityClass - VIII	Soils (and landforms) in Class VIII have limitations that preclude their use for commercial plant production and restrict their use.
compkind	F	Family	
compkind	G	Taxon above family	
compkind	M	Miscellaneous area	
compkind	S	Series	
compkind	T	Taxadjunct	
compkind	V	Variant	
drainage	E	Excessively	Soils have very high and high hydraulic conductivity and low water holding capacity. Depth to water table is more than 6 feet.
drainage	MW	Moderately well	Soils have a layer of low hydraulic conductivity, wet state high in the profile. Depth to water table is 3 to 6 feet.
drainage	P	Poorly	Soils may have a saturated zone, a layer of low hydraulic conductivity, or seepage. Depth to water table is less than 1 foot.
drainage	SE	Somewhat excessively	Soils have high hydraulic conductivity and low water holding capacity. Depth to water table is more than 6 feet.
drainage	SP	Somewhat poorly	Soils commonly have a layer with low hydraulic conductivity, wet state high in profile, etc. Depth to water table is 1 to 3 feet.
drainage	VP	Very poorly	Soils are wet to the surface most of the time. Depth to water table is less than 1 foot, or is ponded.
drainage	W	Well	Soils have intermediate water holding capacity. Depth to water table is more than 6 feet.

Element	Code	Code Name	Code Description
fips	AK	02	
fips	AL	01	
fips	AR	05	
fips	AZ	04	
fips	CA	06	
fips	CO	08	
fips	CT	09	
fips	DE	10	
fips	FL	12	
fips	GA	13	
fips	HI	15	
fips	IA	19	
fips	ID	16	
fips	IL	17	
fips	IN	18	
fips	KS	20	
fips	KY	21	
fips	LA	22	
fips	MA	25	
fips	MD	24	
fips	ME	23	
fips	MI	26	
fips	MN	27	
fips	MNTC	63	
fips	MO	29	
fips	MS	28	
fips	MT	30	
fips	NC	37	
fips	ND	38	
fips	NE	31	
fips	NENTC	61	
fips	NH	33	
fips	NJ	34	
fips	NM	35	
fips	NV	32	
fips	NY	36	
fips	OH	39	
fips	OK	40	
fips	OR	41	
fips	PA	42	
fips	PR	72	
fips	RI	44	
fips	SC	45	
fips	SD	46	
fips	SNTC	62	
fips	TN	47	
fips	TX	48	
fips	UT	49	
fips	VA	51	
fips	VT	50	
fips	WA	53	
fips	WI	55	
fips	WNTC	64	
fips	WV	54	
fips	WY	56	

Element	Code	Code Name	Code Description
flodur	BRIEF	Brief	Flood Duration Class - Brief — Average duration of inundation per flood is 2 to 7 days.
flodur	LONG	Long	Flood Duration Class - Long — Average duration of inundation per flood is 7 days to 1 month.
flodur	VERY BRIEF	Very brief	Flood Duration Class - Very brief — Average duration of inundation per flood is less than 2 days.
flodur	VERY LONG	Very long	Flood Duration Class - Very long — Average duration of inundation per flood is more than 1 month.
flofreq	COMM	Common Frequency	Class - Common — Is OCCAS/FREQ
flofreq	FREQ	Frequent Frequency	Class - Frequent — Flooding is likely to occur often, more than 50 percent chance of flooding in any year (at least 50 times in 100 years).
flofreq	NONE	None Frequency	Class - None — Flooding is not likely to occur.
flofreq	OCCAS	Occasional Frequency	Class - Occasional — Flooding is expected infrequently, 5 to 50 percent chance of flooding in any year (5 to 50 times in 100 years).
flofreq	RARE	Rare Frequency	Class - Rare — Flooding unlikely but possible, 0 to 5 percent chance of flooding in any year (0 to 5 times in 100 years).
flood	FREQ	Frequent Frequency	Class - Frequent (Hydric Only) — Flooding is likely to occur often, more than 50 percent chance of flooding in any year (at least 50 times in 100 years).
flood	NONE	None Frequency	Class - None (Hydric Only) — Flooding is not likely to occur.
flood	OCCAS	Occasional	Flooding is expected infrequently, 5 to 50 percent chance of flooding in any year (5 to 50 times in 100 years).
flood	RARE	Rare	Frequency Class - Rare (Hydric Only) — Flooding unlikely but possible, 0 to 5 percent chance of flooding in any year (0 to 5 times in 100 years).
frostact	HIGH	High	
frostact	LOW	Low	
frostact	MODERATE	Moderate	

Element	Code	Code Name	Code Description
grpcode	—	Null value indicator	
grpcode	1	Septic tank absorption fields	
grpcode	10	Local roads and streets	
grpcode	11	Lawns, landscaping, and golf fairways	
grpcode	12	Roadfill	
grpcode	13	Sand	
grpcode	14	Gravel	
grpcode	15	Topsoil	
grpcode	16	Pond reservoir area	
grpcode	17	Embankments, dikes, and levees	
grpcode	18	Aquifer-fed excavated ponds	
grpcode	19	Drainage	
grpcode	2	Sewage lagoons	
grpcode	20	Irrigation	
grpcode	21	Terraces and diversions	
grpcode	22	Grassed waterways	
grpcode	23	Camp areas	
grpcode	24	Picnic areas	
grpcode	25	Playgrounds	
grpcode	26	Paths and trails	
grpcode	3	Trench sanitary landfill	
grpcode	4	Area sanitary landfill	
grpcode	5	Daily cover for landfill	
grpcode	6	Shallow excavations	
grpcode	7	Dwellings without basements	
grpcode	8	Dwellings with basements	
grpcode	9	Small commercial buildings	
grtgroup	AAQAL	Albaqualfs	
grtgroup	AAQDU	Duraqualfs	
grtgroup	AAQEN	Endoaqualfs	
grtgroup	AAQEP	Epiaqualfs	
grtgroup	AAQFR	Fragiaqualfs	
grtgroup	AAQGL	Glossaqualfs	
grtgroup	AAQKA	Kandiaqualfs	
grtgroup	AAQNA	Natraqualfs	
grtgroup	AAQOC	Ochraqualfs	
grtgroup	AAQPN	Plinthaqualfs	
grtgroup	AAQTR	Tropaqualfs	
grtgroup	AAQUM	Umbraqualfs	
grtgroup	ABOCR	Cryoboralfs	
grtgroup	ABOEU	Eutroboralfs	
grtgroup	ABOFR	Fragiboralfs	
grtgroup	ABOGL	Glossoboralfs	
grtgroup	ABONA	Natriboralfs	
grtgroup	ABOPA	Paleboralfs	
grtgroup	AUDAG	Agrudalfs	
grtgroup	AUDFE	Ferrudalfs	
grtgroup	AUDFR	Fragiudalfs	
grtgroup	AUDFS	Fraglossudalfs	
grtgroup	AUDGL	Glossudalfs	
grtgroup	AUDHA	Hapludalfs	
grtgroup	AUDKA	Kandiudalfs	

Element	Code	Code Name	Code Description
grtgroup	AUDKH	Kanhapludalfs	
grtgroup	AUDNA	Natrudalfs	
grtgroup	AUDPA	Paleudalfs	
grtgroup	AUDRH	Rhodudalfs	
grtgroup	AUDTR	Tropudalfs	
grtgroup	AUSDU	Durustalfs	
grtgroup	AUSHA	Haplustalfs	
grtgroup	AUSKA	Kandiustalfs	
grtgroup	AUSKH	Kanhaplustalfs	
grtgroup	AUSNA	Natrustalfs	
grtgroup	AUSPA	Paleustalfs	
grtgroup	AUSPN	Plinthustalfs	
grtgroup	AUSRH	Rhodustalfs	
grtgroup	AXEDU	Durixeralfs	
grtgroup	AXEFR	Fragixeralfs	
grtgroup	AXEHA	Haploxeralfs	
grtgroup	AXENA	Natrixeralfs	
grtgroup	AXEPA	Palexeralfs	
grtgroup	AXEPN	Plinthoxeralfs	
grtgroup	AXERH	Rhodoxeralfs	
grtgroup	CAQCR	Cryaquands	
grtgroup	CAQDU	Duraquands	
grtgroup	CAQEN	Endoaquands	
grtgroup	CAQEP	Epiaquands	
grtgroup	CAQHA	Haplaquands	
grtgroup	CAQME	Melanaquands	
grtgroup	CAQPK	Placaquands	
grtgroup	CAQVI	Vitraquands	
grtgroup	CCRFU	Fulvicryands	
grtgroup	CCRGE	Gelicryands	
grtgroup	CCRHA	Haplocryands	
grtgroup	CCRHY	Hydrocryands	
grtgroup	CCRME	Melanocryands	
grtgroup	CCRVI	Vitricryands	
grtgroup	CTOVI	Vitritorrands	
grtgroup	CUDDU	Durudands	
grtgroup	CUDFU	Fulvudands	
grtgroup	CUDHA	Hapludands	
grtgroup	CUDHY	Hydrudands	
grtgroup	CUDME	Melanudands	
grtgroup	CUDPK	Placudands	
grtgroup	CUSDU	Durustands	
grtgroup	CUSHA	Haplustands	
grtgroup	CVlUD	Udivitrands	
grtgroup	CVlUS	Ustivitrands	
grtgroup	CXEHA	Haploxerands	
grtgroup	CXEME	Melanoxerands	
grtgroup	CXEVI	Vitrixerands	
grtgroup	DARDU	Durargids	
grtgroup	DARHA	Haplargids	
grtgroup	DARND	Nadurargids	
grtgroup	DARNT	Natrargids	
grtgroup	DARPA	Paleargids	
grtgroup	DORCL	Calciorthids	
grtgroup	DORCM	Camborthids	

Element	Code	Code Name	Code Description
grtgroup	DORDU	Durorthids	
grtgroup	DORGY	Gypsiorthids	
grtgroup	DORPA	Paleorthids	
grtgroup	DORSA	Salorthids	
grtgroup	EAQCR	Cryaquents	
grtgroup	EAQEN	Endoaquents	
grtgroup	EAQEP	Epiaquents	
grtgroup	EAQFL	Fluvaquents	
grtgroup	EAQHA	Haplaquents	
grtgroup	EAQHY	Hydraquents	
grtgroup	EAQPS	Psammaquents	
grtgroup	EAQSU	Sulfaquents	
grtgroup	EAQTR	Tropaquents	
grtgroup	EARTO	Torriarents	
grtgroup	EARUD	Udarents	
grtgroup	EARUS	Ustarents	
grtgroup	EARXE	Xerarents	
grtgroup	EFLCR	Cryofluvents	
grtgroup	EFLTO	Torrifluvents	
grtgroup	EFLTR	Tropofluvents	
grtgroup	EFLUD	Udifluvents	
grtgroup	EFLUS	Ustifluvents	
grtgroup	EFLXE	Xerofluvents	
grtgroup	EORCR	Cryorthents	
grtgroup	EORTO	Torriorthents	
grtgroup	EORTR	Troporthents	
grtgroup	EORUD	Udorthents	
grtgroup	EORUS	Ustorthents	
grtgroup	EORXE	Xerorthents	
grtgroup	EPSCR	Cryopsamments	
grtgroup	EPSQU	Quartzipsamments	
grtgroup	EPSTO	Torripsamments	
grtgroup	EPSTR	Tropopsamments	
grtgroup	EPSUD	Udipsamments	
grtgroup	EPSUS	Ustipsamments	
grtgroup	EPSXE	Xeropsamments	
grtgroup	HFIBO	Borofibrists	
grtgroup	HFICR	Cryofibrists	
grtgroup	HFILU	Luvifibrists	
grtgroup	HFIME	Medifibrists	
grtgroup	HFISP	Sphagnofibrists	
grtgroup	HFITR	Tropofibrists	
grtgroup	HFOBO	Borofolists	
grtgroup	HFOCR	Cryofolists	
grtgroup	HFOME	Medifolists	
grtgroup	HFOTR	Tropofolists	
grtgroup	HHEBO	Borohemists	
grtgroup	HHECR	Cryohemists	
grtgroup	HHELU	Luvihemists	
grtgroup	HHEME	Medihemists	
grtgroup	HHESI	Sulfihemists	
grtgroup	HHESO	Sulfohemists	
grtgroup	HHETR	Tropohemists	
grtgroup	HSABO	Borosaprists	
grtgroup	HSACR	Cryosaprists	

Element	Code	Code Name	Code Description
grtgroup	HSAME	Medisaprists	
grtgroup	HSASI	Sulfisaprists	
grtgroup	HSASO	Sulfosaprists	
grtgroup	HSATR	Troposaprists	
grtgroup	IANCR	Cryandepts	
grtgroup	IANDU	Durandepts	
grtgroup	IANDY	Dystrandepts	
grtgroup	IANEU	Eutrandepts	
grtgroup	IANHY	Hydrandepts	
grtgroup	IANPK	Placandepts	
grtgroup	IANVI	Vitrandepts	
grtgroup	IAQAN	Andaquepts	
grtgroup	IAQCR	Cryaquepts	
grtgroup	IAQEN	Endoaquepts	
grtgroup	IAQEP	Epiaquepts	
grtgroup	IAQFR	Fragiaquepts	
grtgroup	IAQHL	Halaquepts	
grtgroup	IAQHP	Haplaquepts	
grtgroup	IAQHU	Humaquepts	
grtgroup	IAQPK	Placaquepts	
grtgroup	IAQPN	Plinthaquepts	
grtgroup	IAQSU	Sulfaquepts	
grtgroup	IAQTR	Tropaquepts	
grtgroup	IOCCR	Cryochrepts	
grtgroup	IOCDU	Durochrepts	
grtgroup	IOCDY	Dystrochrepts	
grtgroup	IOCEU	Eutrochrepts	
grtgroup	IOCFR	Fragiochrepts	
grtgroup	IOCSU	Sulfochrepts	
grtgroup	IOCUS	Ustochrepts	
grtgroup	IOCXE	Xerochrepts	
grtgroup	IPLPL	Plaggepts	
grtgroup	ITRDY	Dystropepts	
grtgroup	ITREU	Eutropepts	
grtgroup	ITRHU	Humitropepts	
grtgroup	ITRSO	Sombritropepts	
grtgroup	ITRUS	Ustropepts	
grtgroup	IUMCR	Cryumbrepts	
grtgroup	IUMFR	Fragiumbrepts	
grtgroup	IUMHA	Haplumbrepts	
grtgroup	IUMXE	Xerumbrepts	
grtgroup	MALAR	Argialbolls	
grtgroup	MALNA	Natralbolls	
grtgroup	MAQAR	Argiaquolls	
grtgroup	MAQCA	Calciaquolls	
grtgroup	MAQCR	Cryaquolls	
grtgroup	MAQDU	Duraquolls	
grtgroup	MAQEN	Endoaquolls	
grtgroup	MAQEP	Epiaquolls	
grtgroup	MAQHA	Haplaquolls	
grtgroup	MAQNA	Natraquolls	
grtgroup	MBOAR	Argiborolls	
grtgroup	MBOCA	Calciborolls	
grtgroup	MBOCR	Cryoborolls	
grtgroup	MBOHA	Haploborolls	

Element	Code	Code Name	Code Description
grtgroup	MBONA	Natriborolls	
grtgroup	MBOPA	Paleborolls	
grtgroup	MBOVE	Vermiborolls	
grtgroup	MRERE	Rendolls	
grtgroup	MUDAR	Argiudolls	
grtgroup	MUDCA	Calciudolls	
grtgroup	MUDHA	Hapludolls	
grtgroup	MUDPA	Paleudolls	
grtgroup	MUDVE	Vermudolls	
grtgroup	MUSAR	Argiustolls	
grtgroup	MUSCA	Calciustolls	
grtgroup	MUSDU	Durustolls	
grtgroup	MUSHA	Haplustolls	
grtgroup	MUSNA	Natrustolls	
grtgroup	MUSPA	Paleustolls	
grtgroup	MUSVE	Vermustolls	
grtgroup	MXEAR	Argixerolls	
grtgroup	MXECA	Calcixerolls	
grtgroup	MXEDU	Durixerolls	
grtgroup	MXEHA	Haploxerolls	
grtgroup	MXENA	Natrixerolls	
grtgroup	MXEPA	Palexerolls	
grtgroup	OAQAC	Acraquox	
grtgroup	OAQEU	Eutraquox	
grtgroup	OAQGI	Gibbsiaquox	
grtgroup	OAQHA	Haplaquox	
grtgroup	OAQOC	Ochraquox	
grtgroup	OAQPN	Plinthaquox	
grtgroup	OAQUM	Umbraquox	
grtgroup	OHUAC	Acrohumox	
grtgroup	OHUGI	Gibbsihumox	
grtgroup	OHUHA	Haplohumox	
grtgroup	OHUSO	Sombrihumox	
grtgroup	OORAC	Acrorthox	
grtgroup	OOREU	Eutrorthox	
grtgroup	OORGI	Gibbsiorthox	
grtgroup	OORHA	Haplorthox	
grtgroup	OORSO	Sombriorthox	
grtgroup	OORUM	Umbriorthox	
grtgroup	OPRAC	Acroperox	
grtgroup	OPREU	Eutroperox	
grtgroup	OPRHA	Haploperox	
grtgroup	OPRKA	Kandiperox	
grtgroup	OPRSO	Sombriperox	
grtgroup	OTOAC	Acrotorrox	
grtgroup	OTOEU	Eutrotorrox	
grtgroup	OTOHA	Haplotorrox	
grtgroup	OTOTO	Torrox	
grtgroup	OUDAC	Acrudox	
grtgroup	OUDEU	Eutrudox	
grtgroup	OUDHA	Hapludox	
grtgroup	OUDKA	Kandiudox	
grtgroup	OUDSO	Sombriudox	
grtgroup	OUSAC	Acrustox	
grtgroup	OUSEU	Eutrustox	

Element	Code	Code Name	Code Description
grtgroup	OUSHA	Haplustox	
grtgroup	OUSKA	Kandiustox	
grtgroup	OUSSO	Sombriustox	
grtgroup	SAQA2	Alaquods	
grtgroup	SAQCR	Cryaquods	
grtgroup	SAQDU	Duraquods	
grtgroup	SAQEN	Endoaquods	
grtgroup	SAQEP	Epiaquods	
grtgroup	SAQFR	Fragiaquods	
grtgroup	SAQHA	Haplaquods	
grtgroup	SAQPK	Placaquods	
grtgroup	SAQSI	Sideraquods	
grtgroup	SAQTR	Tropaquods	
grtgroup	SCRDU	Duricryods	
grtgroup	SCRHA	Haplocryods	
grtgroup	SCRHU	Humicryods	
grtgroup	SCRPK	Placocryods	
grtgroup	SFEFE	Ferrods	
grtgroup	SHUCR	Cryohumods	
grtgroup	SHUDU	Durihumods	
grtgroup	SHUFR	Fragihumods	
grtgroup	SHUHA	Haplohumods	
grtgroup	SHUPK	Placohumods	
grtgroup	SHUTR	Tropohumods	
grtgroup	SORA2	Alorthods	
grtgroup	SORCR	Cryorthods	
grtgroup	SORDU	Durorthods	
grtgroup	SORFR	Fragiorthods	
grtgroup	SORHA	Haplorthods	
grtgroup	SORPK	Placorthods	
grtgroup	SORTR	Troporthods	
grtgroup	UAQAL	Albaquults	
grtgroup	UAQEN	Endoaquults	
grtgroup	UAQEP	Epiaquults	
grtgroup	UAQFR	Fragiaquults	
grtgroup	UAQKA	Kandiaquults	
grtgroup	UAQKH	Kanhaplaquults	
grtgroup	UAQOC	Ochraquults	
grtgroup	UAQPA	Paleaquults	
grtgroup	UAQPN	Plinthaquults	
grtgroup	UAQTR	Tropaquults	
grtgroup	UAQUM	Umbraquults	
grtgroup	UHUHA	Haplohumults	
grtgroup	UHUKA	Kandihumults	
grtgroup	UHUKH	Kanhaplohumults	
grtgroup	UHUPA	Palehumults	
grtgroup	UHUPN	Plinthohumults	
grtgroup	UHUSO	Sombrihumults	
grtgroup	UHUTR	Tropohumults	
grtgroup	UUDFR	Fragiudults	
grtgroup	UUDHA	Hapludults	
grtgroup	UUDKA	Kandiudults	
grtgroup	UUDKH	Kanhapludults	
grtgroup	UUDPA	Paleudults	
grtgroup	UUDPN	Plinthudults	

Element	Code	Code Name	Code Description
grtgroup	UUDRH	Rhodudults	
grtgroup	UUDTR	Tropudults	
grtgroup	UUSHA	Haplustults	
grtgroup	UUSKA	Kandiustults	
grtgroup	UUSKH	Kanhaplustults	
grtgroup	UUSPA	Paleustults	
grtgroup	UUSPN	Plinthustults	
grtgroup	UUSRH	Rhodustults	
grtgroup	UXEHA	Haploxerults	
grtgroup	UXEPA	Palexerults	
grtgroup	VAQCA	Calciaquerts	
grtgroup	VAQDU	Duraquerts	
grtgroup	VAQDY	Dystraquerts	
grtgroup	VAQEN	Endoaquerts	
grtgroup	VAQEP	Epiaquerts	
grtgroup	VAQNA	Natraquerts	
grtgroup	VAQSA	Salaquerts	
grtgroup	VCRHA	Haplocryerts	
grtgroup	VCRHU	Humicryerts	
grtgroup	VTOCA	Calcitorrerts	
grtgroup	VTOGY	Gypsitorrerts	
grtgroup	VTOHA	Haplotorrerts	
grtgroup	VTOSA	Salitorrerts	
grtgroup	VTOTO	Torrerts	
grtgroup	VUDCH	Chromuderts	
grtgroup	VUDDY	Dystruderts	
grtgroup	VUDHA	Hapluderts	
grtgroup	VUDPE	Pelluderts	
grtgroup	VUSCA	Calciusterts	
grtgroup	VUSCH	Chromusterts	
grtgroup	VUSDY	Dystrusterts	
grtgroup	VUSGY	Gypsiusterts	
grtgroup	VUSHA	Haplusterts	
grtgroup	VUSPE	Pellusterts	
grtgroup	VUSSA	Salusterts	
grtgroup	VXECA	Calcixererts	
grtgroup	VXECH	Chromoxererts	
grtgroup	VXEDU	Durixererts	
grtgroup	VXEHA	Haploxererts	
grtgroup	VXEPE	Pelloxererts	
hydgrp	A	Hydrology	Class - A High infiltration rates. Soils are deep, well drained to excessively drained sands and gravels.
hydgrp	A/D	Hydrology	Class - A/D Drained/undrained hydrology class of soils that can be drained and are classified.
hydgrp	B	Hydrology	Class - B Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.
hydgrp	B/D	Hydrology	Class - B/D Drained/undrained hydrology class of soils that can be drained and are classified.

Element	Code	Code Name	Code Description
ydgrp	C	Hydrology	Class - C Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.
hydgrp	C/D	Hydrology	Class - C/D Drained/undrained hydrology class of soils that can be drained and classified.
hydgrp	D	Hydrology	Class - D Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.
hydric	N	No	Soil does not meet the requirements for a hydric soil.
hydric	U	Unranked	Soil has not been ranked with hydric criteria.
hydric	Y	Yes	Soil meets the requirements for a hydric soil.
kfact	.02		
kfact	.05		
kfact	.1		
kfact	.10		
kfact	.15		
kfact	.17		
kfact	.2		
kfact	.20		
kfact	.24		
kfact	.28		
kfact	.32		
kfact	.37		
kfact	.43		
kfact	.49		
kfact	.55		
kfact	.64		
kfact	0.02		
kfact	0.05		
kfact	0.10		
kfact	0.15		
kfact	0.17		
kfact	0.20		
kfact	0.24		
kfact	0.28		
kfact	0.32		
kfact	0.37		
kfact	0.43		
kfact	0.49		
kfact	0.55		
kfact	0.64		
minalogy	01	unclassified	
minalogy	02	not used	
minalogy	03	allitic	
minalogy	04	calcareous	
minalogy	05	carbonatic	
minalogy	07	clastic	
minalogy	08	coprogenous	

Element	Code	Code Name	Code Description
minalogy	09	chloritic	
minalogy	10	diatomaceous	
minalogy	12	ferrihumic	
minalogy	14	ferritic	
minalogy	16	ferruginous	
minalogy	18	gibbsitic	
minalogy	20	glauconitic	
minalogy	22	gypsic	
minalogy	24	halloysitic	
minalogy	26	illitic	
minalogy	27	illitic (calcareous)	
minalogy	28	kaolinitic	
minalogy	30	marly	
minalogy	32	micaceous	
minalogy	33	micaceous (calcareous)	
minalogy	34	mixed	
minalogy	35	mixed (calcareous)	
minalogy	37	montmorillonitic	
minalogy	38	montmorillonitic (calcareous)	
minalogy	40	oxidic	
minalogy	42	sepiolitic	
minalogy	44	serpentinitic	
minalogy	46	siliceous	
minalogy	47	siliceous (calcareous)	
minalogy	48	sesquic	
minalogy	50	vermiculitic	
minalogy	51	vermiculitic (calcareous)	
mlra	1	Northern Pacific Coast Range, foothills, and Valleys	
mlra	10	Upper Snake River Lava Plains and Hills	
mlra	100	Erie Fruit and Truck Area	
mlra	101	Ontario Plain and Finger Lakes Region	
mlra	102A	Rolling Till Prairie	
mlra	102B	Loess Upland and Till Plains	
mlra	103	Central Iowa and Minnesota Till Prairies	
mlra	104	Eastern Iowa and Minnesota Till Prairies	
mlra	105	Northern Mississippi Valley Loess Hills	
mlra	106	Nebraska and Kansas Loess-Drift Hills	

Element	Code	Code Name	Code Description
mlra	107	Iowa and Missouri Deep Loess Hills	
mlra	108	Illinois and Iowa Deep Loess and Drift	
mlra	108A	Illinois and Iowa Deep Loess and Drift, Eastern Part (proposed)	
mlra	108B	Illinois and Iowa Deep Loess and Drift, East Central Part (proposed)	
mlra	108C	Illinois and Iowa Deep Loess and Drift, West Central Part (proposed)	
mlra	108D	Illinois and Iowa Deep Loess and Drift, Western Part (proposed)	
mlra	109	Iowa and Missouri Heavy Till Plain	
mlra	10A	Big and Little Wood River Footslopes and Plains (proposed)	
mlra	11	Snake River Plains	
mlra	110	Northern Illinois and Indiana Heavy Till Plain	
mlra	111	Indiana and Ohio Till Plain	
mlra	112	Cherokee Prairies	
mlra	113	Central Claypan Areas	
mlra	114	Southern Illinois and Indiana Thin Loess and Till Plain	
mlra	115	Central Mississippi Valley Wooded Slopes	
mlra	115A	Central Mississippi Valley Wooded Slopes, Eastern Part (proposed)	
mlra	115B	Central Mississippi Valley Wooded Slopes, Southern Part (proposed)	

Element	Code	Code Name	Code Description
mlra	115C	Central Mississippi Valley Wooded Slopes, Northern Part (proposed)	
mlra	116A	Ozark Highland	
mlra	116B	Ozark Border	
mlra	117	Boston Mountains	
mlra	118	Arkansas Valley and Ridges	
mlra	118A	Arkansas Valley and Ridges, Eastern Part (proposed)	
mlra	118B	Arkansas Valley and Ridges, Western Part (proposed)	
mlra	119	Ouachita Mountains	
mlra	11A	Central Snake River Plains (proposed)	
mlra	11B	Upper Snake River Plains (proposed)	
mlra	12	Lost River Valleys and Mountains	
mlra	120	Kentucky and Indiana Sandstone and Shale Hills and Valleys	
mlra	121	Kentucky Bluegrass	
mlra	122	Highland Rim and Pennyroyal	
mlra	123	Nashville Basin	
mlra	124	Western Allegheny Plateau	
mlra	125	Cumberland Plateau and Mountains	
mlra	126	Central Allegheny Plateau	
mlra	127	Eastern Allegheny Plateau and Mountains	
mlra	128	Southern Appalachian Ridges and Valleys	
mlra	129	Sand Mountain	
mlra	13	Eastern Idaho Plateaus	

Element	Code	Code Name	Code Description
mlra	130	Blue Ridge	
mlra	131	Southern Mississippi Valley Alluvium	
mlra	133A	Southern Coastal Plain	
mlra	133B	Western Coastal Plain	
mlra	134	Southern Mississippi Valley Silty Uplands	
mlra	135	Alabama, Mississippi, and Arkansas Blackland Prairies	
mlra	136	Southern Piedmont	
mlra	137	Carolina and Georgia Sand Hills	
mlra	138	North-Central Florida Ridge	
mlra	139	Eastern Ohio Till Plain	
mlra	14	Central California Coastal Valleys	
mlra	140	Glaciated Allegheny Plateau and Catskill Mountains	
mlra	141	Tughill Plateau	
mlra	142	St. Lawrence-Champlain Plain	
mlra	143	Northeastern Mountains	
mlra	144A	New England and Eastern New York Upland, Southern Part	
mlra	144B	New England and Eastern New York Upland, Northern Part	
mlra	145	Connecticut Valley	
mlra	146	Aroostock Area	
mlra	147	Northern Appalachain Ridges and Valleys	
mlra	148	Northern Piedmont	
mlra	149A	Northern Coastal Plain	
mlra	149B	Long Island-Cape Cod Coastal Lowland	

Element	Code	Code Name	Code Description
mlra	15	Central California Coast Range	
mlra	150A	Gulf Coast Prairies	
mlra	150B	Gulf Coast Saline Prairies	
mlra	151	Gulf Coast Marsh	
mlra	152A	Eastern Gulf Coast Flatwoods	
mlra	152B	Western Gulf Coast Flatwoods	
mlra	153A	Atlantic Coast Flatwoods	
mlra	153B	Tidewater Area	
mlra	153C	Mid-Atlantic Coastal Plain	
mlra	154	South-Central Florida Ridge	
mlra	155	Southern Florida Flatwoods	
mlra	156A	Florida Everglades and Associated Areas	
mlra	156B	Southern Florida Lowlands	
mlra	157	Arid and Semiarid Low Mountain Slopes	
mlra	158	Semiarid and Subhumid Low Mountain Slopes	
mlra	159	Humid and Very Humid Low and Intermediate Mountain Slopes	
mlra	16	California Delta	
mlra	160	Subhumid and Humid Intermediate and High Mountain Slopes	
mlra	161	Lava Flows and Rock Outcrops	
mlra	162	Very Humid Areas on East and West Maui Mountains, Kohala Mountains, and Mount Waialeale	
mlra	163	Alluvial Fans and Coastal Plains	
mlra	164	Rough Mountainous Lands	

Element	Code	Code Name	Code Description
mlra	165	Subhumid Intermediate Mountain Slopes	
mlra	166	Very Stony Land and Rock Land	
mlra	167	Humid Low and Intermediate Mountain Slopes	
mlra	168	Southeastern Alaska	
mlra	169	South-Central Alaska Mountains	
mlra	17	Sacramento and San Joaquin Valleys	
mlra	170	Cook Inlet-Susitna Lowland	
mlra	171	Alaska Peninsula and Southwestern Islands	
mlra	172	Cooper River Plateau	
mlra	173	Alaska Range	
mlra	174	Interior Alaska Lowlands	
mlra	175	Kuskokwim Highlands	
mlra	176	Interior Alaska Highlands	
mlra	177	Norton Sound Highlands	
mlra	178	Western Alaska Coastal Plains and Deltas	
mlra	179	Bering Sea Islands	
mlra	18	Sierra Nevada Foothills	
mlra	180	Brooks Range	
mlra	181	Arctic Foothills	
mlra	182	Arctic Coastal Plains	
mlra	19	Southern California Coastal Plain	
mlra	190	Ponape (proposed)	Pacific Basin Area
mlra	191	Kosrae (proposed)	Pacific Basin Area
mlra	192	Marshall Islands (proposed)	Pacific Basin Area

Element	Code	Code Name	Code Description
mlra	193	Truk (proposed)	Pacific Basin Area
mlra	194	Yap (proposed)	Pacific Basin Area
mlra	195	Palau (proposed)	Pacific Basin Area
mlra	196	Tutuila, Aunu'u (proposed)	Pacific Basin Area
mlra	197	Tau (proposed)	Pacific Basin Area
mlra	198	Ofu, Olosega (proposed)	Pacific Basin Area
mlra	199	Northern Guam (proposed)	Pacific Basin Area
mlra	2	Willamette and Puget Sound Valleys	
mlra	20	Southern California Mountains	
mlra	200	Southern Guam (proposed)	Pacific Basin Area
mlra	201	Saipan (proposed)	Pacific Basin Area
mlra	202	Aguijan, Tinian (proposed)	Pacific Basin Area
mlra	203	Rota (proposed)	Pacific Basin Area
mlra	21	Klamath and Shasta Valleys and Basins	
mlra	22	Sierra Nevada Range	
mlra	23	Malheur High Plateau	
mlra	24	Humboldt Area	
mlra	25	Owyhee High Plateau	
mlra	26	Carson Basin and Mountains	
mlra	27	Fallon-Lovelock Area	
mlra	270	Humid Mountains and Valleys (proposed)	
mlra	271	Semiarid Mountains and Valleys (proposed)	
mlra	272	Humid Coastal Plains (proposed)	
mlra	273	Semiarid Coastal Plains (proposed)	
mlra	28A	Great Salt Lake Area	

Element	Code	Code Name	Code Description
mlra	28B	Central Nevada Basin And Range	
mlra	29	Southern Nevada Basin and Range	
mlra	3	Olympic and Cascade Mountains	
mlra	30	Sonoran Basin and Range	
mlra	31	Imperial Valley	
mlra	32	Northern Intermountain Desertic Basins	
mlra	33	Semiarid Rocky Mountains	
mlra	34	Central Desertic Basins, Mountains, and Plateaus	
mlra	35	Colorado and Green River Plateaus	
mlra	36	New Mexico and Arizona Plateaus and Mesas	
mlra	36A	Western Mesas, Plateaus and Basins (proposed)	
mlra	36B	Western Plateaus and Plains (proposed)	
mlra	37	San Juan River Valley Mesas and Plateaus	
mlra	39	Arizona and New Mexico Mountains	
mlra	4	California Coastal Redwood Belt	
mlra	40	Central Arizona Basin and Range	
mlra	41	Southeastern Arizona Basin and Range	
mlra	42	Southern Desertic Basins, Plains, and Mountains	
mlra	42A	Southern Desert Rio Grande Central Basin (proposed)	

Element	Code	Code Name	Code Description
mlra	42B	Southern Desert Basin and Range (proposed)	
mlra	42C	Southern Desert Pecos Basin (proposed)	
mlra	43	Northern Rocky Mountains	
mlra	44	Northern Rocky Mountain Valleys	
mlra	46	Northern Rocky Mountain Foothills	
mlra	47	Wasatch and Uinta Mountains	
mlra	48A	Southern Rocky Mountains	
mlra	48B	Southern Rocky Mountain Parks	
mlra	49	Southern Rocky Mountain Foothills	
mlra	5	Siskiyou-Trinity Area	
mlra	51	High Intermountain Valleys	
mlra	52	Brown Glaciated Plain	
mlra	53A	Northern Dark Brown Glaciated Plains	
mlra	53B	Central Dark Brown Glaciated Plains	
mlra	53C	Southern Dark Brown Glaciated Plains	
mlra	54	Rolling Soft Shale Plain	
mlra	55A	Northern Black Glaciated Plains	
mlra	55B	Central Black Glaciated Plains	
mlra	55C	Southern Black Glaciated Plains	
mlra	56	Red River Valley of the North	
mlra	57	Northern Minnesota Gray Drift	

Element	Code	Code Name	Code Description
mlra	58A	Northern Rolling High Plains, Northern Part	
mlra	58B	Northern Rolling High Plains, Southern Part	
mlra	58C	Northern Rolling High Plains, Northeastern Part	
mlra	58D	Northern Rolling High Plains, Eastern Part	
mlra	6	Cascade Mountains, Eastern Slope	
mlra	60A	Pierre Shale Plains and Badlands	
mlra	60B	Pierre Shale Plains, Northern Part	
mlra	61	Black Hills Foot Slopes	
mlra	62	Black Hills	
mlra	63A	Northern Rolling Pierre Shale Plains	
mlra	63B	Southern Rolling Pierre Shale Plains	
mlra	64	Mixed Sandy and Silty Tableland	
mlra	65	Nebraska Sand Hills	
mlra	66	Dakota-Nebraska Eroded Tableland	
mlra	67	Central High Plains	
mlra	69	Upper Arkansas Valley Rolling Plains	
mlra	7	Columbia Basin	
mlra	70	Pecos-Canadian Plains and Valleys	
mlra	70A	Canadian Plains and Valleys (proposed)	
mlra	70B	Upper Pecos Valley (proposed)	

Element	Code	Code Name	Code Description
mlra	70C	Central New Mexico Highlands (proposed)	
mlra	70D	Southern Desert Foothills (proposed)	
mlra	70E	Upper Pecos Canadian Breaks and Terraces (proposed)	
mlra	71	Central Nebraska Loess Hills	
mlra	72	Central High Tableland	
mlra	73	Rolling Plains and Breaks	
mlra	74	Central Kansas Sandstone Hills	
mlra	75	Central Loess Plains	
mlra	76	Bluestem Hills	
mlra	77	Southern High Plains	
mlra	77A	Southern High Plains, Northern Part (proposed)	
mlra	77B	Southern High Plains, Northwestern Part (proposed)	
mlra	77C	Southern High Plains, Southern Part (proposed)	
mlra	77D	Southern High Plains, Southwestern Part (proposed)	
mlra	77E	Southern High Plains, Breaks (proposed)	
mlra	78	Central Rolling Red Plains	
mlra	78A	Central Rolling Red Plains, Northern Part (proposed)	
mlra	78B	Central Rolling Red Plains, Western Part (proposed)	
mlra	78C	Central Rolling Red Plains, Eastern Part (proposed)	
mlra	78D	Rolling Limestone Prairie (proposed)	
5 mlra	79	Great Bend Sand Plains	
mlra	8	Columbia Plateau	

Element	Code	Code Name	Code Description
mlra	80A	Central Rolling Red Prairies	
mlra	80B	Texas North-Central Prairies	
mlra	81	Edwards Plateau	
mlra	81A	Edwards Plateau, Western Part (proposed)	
mlra	81B	Edwards Plateau, Central Part (proposed)	
mlra	81C	Edwards Plateau, Eastern Part (proposed)	
mlra	81D	Southern Edwards Plateau (proposed)	
mlra	82	Texas Central Basin	
mlra	82A	Texas Central Basin (proposed)	
mlra	82B	Wichita Mountains (proposed)	
mlra	83A	Northern Rio Grande Plain	
mlra	83B	Western Rio Grande Plain	
mlra	83C	Central Rio Grande Plain	
mlra	83D	Lower Rio Grande Plain	
mlra	84A	Cross Timbers	
mlra	84B	West Cross Timbers	
mlra	84C	East Cross Timbers	
mlra	85	Grand Prairie	
mlra	85A	Grand Prairie (proposed)	
mlra	85B	Arbuckle Mountains (proposed)	
mlra	86	Texas Blackland Prairie	
mlra	86A	Texas Blackland Prairie, Northern Part (proposed)	
mlra	86B	Texas Blackland Prairie, Southern Part (proposed)	
mlra	87	Texas Claypan Area	

Element	Code	Code Name	Code Description
mlra	87A	Texas Claypan Area, Southern Part (proposed)	
mlra	87B	Texas Claypan Area, Northern Part (proposed)	
mlra	88	Northern Minnesota Glacial Lake Basins	
mlra	9	Palouse and Nez Perce Prairies	
mlra	90	Central Wisconsin and Minnesota Thin Loess and Till	
mlra	91	Wisconsin and Minnesota Sandy Outwash	
mlra	92	Superior Lake Plain	
mlra	93	Superior Stony and Rocky Loamy Plains and Hills	
mlra	94A	Northern Michigan and Wisconsin Sandy Drift	
mlra	94B	Michigan Eastern Upper Penninsula Sandy Drift	
mlra	95A	Northeastern Wisconsin Drift Plain	
mlra	95B	Southern Wisconsin and Northern Illinois Drift Plain	
mlra	96	Western Michigan and Northeastern Wisconsin Fruit Belt	
mlra	97	Southwestern Michigan Fruit and Truck Belt	
mlra	98	Southern Michigan and Northern Indiana Drift Plain	
mlra	99	Erie-Huron Lake Plain	

Element	Code	Code Name	Code Description
month	APR	Apr	April
month	AUG	Aug	August
month	DEC	Dec	December
month	FEB	Feb	February
month	JAN	Jan	January
month	JUL	Jul	July
month	JUN	Jun	June
month	MAR	Mar	March
month	MAY	May	May
month	NOV	Nov	November
month	OCT	Oct	October
month	SEP	Sep	September
mukind	A	Association	Two or more soils with a repeating pattern.
mukind	C	Consociation	Seventy-five percent (75%) of map unit within range of taxon.
mukind	U	Undifferentiated Group	Two or more soils that are not continuously coterminous.
mukind	X	Complex	Two or more soils that cannot be mapped seperatey caused by map scale limitations.
noperm	CE	coprogenous earth	Allowable textural code for which no permeability is given.
noperm	CEM	cemented	Allowable textural code for which no permeability is given.
noperm	CIND	cinders	Allowable textural code for which no permeability is given.
noperm	DE	diotomaceous earth	Allowable textural code for which no permeability is given.
noperm	FB	fibric material	Allowable textural code for which no permeability is given.
noperm	FRAG	fragmental material	Allowable textural code for which no permeability is given.
noperm	G	gravel	Allowable textural code for which no permeability is given.
noperm	GYP	gypsiferous material	Allowable textural code for which no permeability is given.
noperm	HM	hemic material	Allowable textural code for which no permeability is given.
noperm	ICE	ice or frozen soil	Allowable textural code for which no permeability is given.

Element	Code	Code Name	Code Description
noperm	IND	indurated	Allowable textural code for which no permeability is given.
noperm	MARL	marl	Allowable textural code for which no permeability is given.
noperm	MPT	mucky-peat	Allowable textural code for which no permeability is given.
noperm	MUCK	muck	Allowable textural code for which no permeability is given.
noperm	PEAT	peat	Allowable textural code for which no permeability is given.
noperm	SG	sand and gravel	Allowable textural code for which no permeability is given.
noperm	SP	sapric material	Allowable textural code for which no permeability is given.
noperm	UNK	unknown	Allowable textural code for which no permeability is given.
noperm	UWB	unweathered bedrock	Allowable textural code for which no permeability is given.
noperm	VAR	variable	Allowable textural code for which no permeability is given.
noperm	WB	weathered bedrock	Allowable textural code for which no permeability is given.
order	A	Alfisols	
order	C	Andisols	
order	D	Aridisols	
order	E	Entisols	
order	H	Histosols	
order	I	Inceptisols	
order	M	Mollisols	
order	O	Oxisols	
order	S	Spodosols	
order	U	Ultisols	
order	V	Vertisols	
ordsym	A	no limitations or slight limitation	
ordsym	C	clayey soils	
ordsym	D	restricted rooting depth	
ordsym	F	fragmental or skeletal soils	
ordsym	N	snow pack	
ordsym	R	relief or slope steepness	
ordsym	S	sandy soils	
ordsym	T	toxic substances	
ordsym	W	excessive wetness	
ordsym	X	stoniness or rockiness	

Element	Code	Code Name	Code Description
otherfam	01	unclassified	
otherfam	02	not used	
otherfam	04	coated	
otherfam	05	cracked	
otherfam	06	level	
otherfam	08	micro	
otherfam	12	ortstein	
otherfam	14	shallow	
otherfam	15	shallow & uncoated	
otherfam	16	sloping	
otherfam	17	shallow & coated	
otherfam	19	ortstein & shallow	
otherfam	20	uncoated	
otherph	AFFR	annual frost-free rainfall	
otherph	ALKALI	alkali	
otherph	ALL	all	
otherph	BRIEF	brief	
otherph	CALC SURF	calcareous surface	
otherph	CHANNELED	channeled	
otherph	COASTAL	coastal	
otherph	COLD	cold	
otherph	COMMON	common flooding	
otherph	COOL	cool	
otherph	DEPTH	depth	
otherph	DISSECTED	dissected	
otherph	DRAINED	drained	
otherph	DRY	dry	
otherph	ELEV	elevation	
otherph	ERODED	eroded	
otherph	ETA	evapotranspiration; actual	
otherph	FFS	frost-free	
otherph	FREQ	frequent flooding	
otherph	GULLIED	gullied	
otherph	HIGH ELEV	high elevation	
otherph	HIGH PE	high potential evapotranspiration	
otherph	HIGH PPT	high precipitation	
otherph	HUMMOCKY	hummocky	
otherph	IRR	irrigated	
otherph	LONG	long	
otherph	LONG FFS	long frost-free season	
otherph	LOW ELEV	low elevation	
otherph	LOW PE	low potential evapotranspiration	
otherph	LOW PPT	low precipitation	
otherph	MAAT	mean annual air temperature	
otherph	MAP	mean annual precipitation	
otherph	MAST	mean annual soil temperature	
otherph	MED PE	medium potential evapotranspiration	
otherph	MED PPT	medium precipitation	
otherph	MOD ALKALI	moderately alkali	
otherph	MOD DEEP	moderately deep	
otherph	MOD SAL-ALK	moderately saline-alkali	

Element	Code	Code Name	Code Description
otherph	MOD SALINE	moderately saline	
otherph	MOD TEMP	moderate temperature	
otherph	MOD THICK	moderately thick	
otherph	MOD WELL DR	moderately well drained	
otherph	MOIST	moist	
otherph	NIRR	nonirrigated	
otherph	NONCALC SURF	noncalcareous surface	
otherph	NONE	no flooding	
otherph	NONERODED	noneroded	
otherph	NONSALINE	nonsaline	
otherph	NORTH	north or east aspect	
otherph	OCCAS	occasional flooding	
otherph	OVERWASH	overwash	
otherph	PARTIALLY DR	partially drained	
otherph	PE	precipitation effectivity	
otherph	PONDED	ponded	
otherph	POORLY DR	poorly drained	
otherph	RANGELAND	rangeland	
otherph	RARE	rare flooding	
otherph	ROCKY	rocky	
otherph	SAL-ALK	saline-alkali	
otherph	SALINE	saline	
otherph	SER ER	severely eroded	
otherph	SHALLOW	shallow	
otherph	SHORT FFS	short frost-free season	
otherph	SLI ALKALI	slight alkali	
otherph	SLI SAL-ALK	slightly saline-alkali	
otherph	SLI SALINE	slightly saline	
otherph	SMD	soil moisture deficit	
otherph	SOUTH	south or west aspect	
otherph	STR ALKALI	strongly alkali	
otherph	STR SAL	strongly saline	
otherph	STR SAL-ALK	strongly saline-alkali	
otherph	SUBIRR	subirrigated	
otherph	SW POORLY DR	somewhat poorly drained	
otherph	THICK	thick solum	
otherph	THICK SURF	thick surface	
otherph	THIN SURF	thin surface	
otherph	UNDRAINED	undrained	
otherph	UNDULATING	undulating	
otherph	V BRIEF	very brief	
otherph	V COLD	very cold	
otherph	V Long	very long	
otherph	V POORLY DR	very poorly drained	
otherph	V ROCKY	very rocky	
otherph	V SHALLOW	very shallow	
otherph	WARM	warm	
otherph	WELL DR	well drained	
otherph	WET	wet	
otherph	WINTER PPT	winter precipitation	
otherph	WOODLAND	woodland	

Element	Code	Code Name	Code Description
panhard	THICK	Thick	Cemented Pan Class - Thick — Pan is more than 3 inches if continuously indurated and more than 18 inches if discontinous or fractured.
panhard	THIN	Thin	Cemented Pan Class - Thin — Pan is less than 3 inches if continuously indurated and less than 18 inches if discontinuous or fractured.
partsize	001	unclassified	
partsize	002	not used	
partsize	003	cindery	
partsize	004	cindery over sandy or sandy-skeletal	
partsize	005	ashy	
partsize	006	cindery over loamy	
partsize	007	ashy over pumiceous or cindery	
partsize	008	ashy over loamy	
partsize	009	ashy-skeletal	
partsize	010	medial	
partsize	011	medial-skeletal	
partsize	012	medial over pumiceous or cindery	
partsize	013	ashy over loamy-skeletal	
partsize	014	medial over clayey	
partsize	015	cindery over medial-skeletal	
partsize	016	medial over fragmental	
partsize	017	cindery over medial	
partsize	018	medial over loamy	
partsize	019	ashy over medial	
partsize	020	medial over loamy-skeletal	
partsize	021	ashy over sandy or sandy-skeletal	
partsize	022	medial over sandy or sandy-skeletal	
partsize	024	medial over thixotropic	
partsize	026	thixotropic	
partsize	027	thixotropic-skeletal	
partsize	028	thixotropic over fragmental	
partsize	030	thixotropic over sandy or sandy-skeletal	
partsize	032	thixotropic over loamy-skeletal	
partsize	034	thixotropic over loamy	
partsize	036	fragmental	
partsize	044	sandy-skeletal	
partsize	046	sandy-skeletal over loamy	
partsize	047	sandy-skeletal over clayey	
partsize	050	loamy-skeletal	
partsize	051	loamy-skeletal over fragmental	
partsize	052	loamy-skeletal over sandy or sandy-skeletal	
partsize	054	loamy-skeletal over clayey	
partsize	055	loamy-skeletal or clayey-skeletal	
partsize	056	clayey-skeletal	
partsize	058	clayey-skeletal over sandy or sandy-skeletal	

Element	Code	Code Name	Code Description
partsize	062	sandy	
partsize	063	sandy or sandy-skeletal	
partsize	064	sandy over loamy	
partsize	066	sandy over clayey	
partsize	068	loamy	
partsize	072	loamy over sandy or sandy-skeletal	
partsize	080	coarse-loamy	
partsize	082	coarse-loamy over fragmental	
partsize	084	coarse-loamy over sandy or sandy-skeletal	
partsize	086	coarse-loamy over clayey	
partsize	088	coarse-silty	
partsize	090	coarse-silty over fragmental	
partsize	092	coarse-silty over sandy or sandy-skeletal	
partsize	094	coarse-silty over clayey	
partsize	096	fine-loamy	
partsize	097	loamy over pumiceous or cindery	
partsize	098	fine-loamy over fragmental	
partsize	100	fine-loamy over sandy or sandy-skeletal	
partsize	102	fine-loamy over clayey	
partsize	104	ashy over clayey	
partsize	106	fine-silty	
partsize	108	fine-silty over fragmental	
partsize	110	fine-silty over sandy or sandy-skeletal	
partsize	112	fine-silty over clayey	
partsize	114	clayey	
partsize	116	clayey over fragmental	
partsize	118	clayey over sandy or sandy-skeletal	
partsize	120	clayey over loamy-skeletal	
partsize	122	clayey over fine-silty	
partsize	124	clayey over loamy	
partsize	126	fine	
partsize	134	very fine	
partsize	136	hydrous	
partsize	138	hydrous-pumiceous	
partsize	140	hydrous-skeletal	
partsize	142	hydrous over clayey	
partsize	144	hydrous over clayey-skeletal	
partsize	146	hydrous over fragmental	
partsize	148	hydrous over loamy	
partsize	150	hydrous over loamy-skeletal	
partsize	152	hydrous over sandy or sandy-skeletal	
partsize	153	ashy-pumiceous	
partsize	154	ashy over medial-skeletal	
partsize	155	medial-pumiceous	
partsize	158	medial over ashy	
partsize	160	medial over clayey-skeletal	

Element	Code	Code Name	Code Description
partsize	162	medial over hydrous	
partsize	163	pumiceous	
partsize	164	pumiceous or ashy-pumiceous over sandy or sandy-skeletal	
partsize	165	pumiceous or ashy-pumiceous over loamy	
partsize	166	pumiceous or ashy-pumiceous over medial-skeletal	
partsize	167	pumiceous or ashy-pumiceous over medial	
partsize	169	ashy-skeletal over fragmental or cindery	
pnddur	BRIEF	brief	Flood Duration Class - Brief (Hydric Only) — Average duration of inundation per flood is 2 to 7 days.
pnddur	LONG	long	Flood Duration Class - Long (Hydric Only) — Average duration of inundation per flood is 7 days to 1 month.
pnddur	VERY BRIEF	very brief	Flood Duration Class - Very brief (Hydric Only) — Average duration of inundation per flood is less than 2 days.
pnddur	VERY LONG	very long	Flood Duration Class - Very long (Hydric Only) — Average duration of inundation more than 1 month.
per flood is			
primfml	0	not prime farmland	Not Prime Farmland.
primfml	1	all areas are prime farmland	All areas are prime farmland.
primfml	2	where drained	Only drained areas are prime farmland.
primfml	3	where protected from flooding or not frequently flooded during the growing season	Only areas protected from flooding or not frequently flooded during the growing season are prime farmland.
primfml	4	where irrigated	Only irrigated areas are prime farmland.
primfml	5	where drained and protected from flooding or not frequently flooded during the growing season	Only drained areas that are either protected from flooding or not frequently flooded during the growing season are prime farmland.
primfml	6	where irrigated and drained	Only irrigated areas that have been drained are prime farmland.
primfml	7	where irrigated and protected from flooding or not frequently flooded during the growing season	Only irrigated areas that are either protected from flooding or not frequently flooded during the growing season are prime farmland.

Element	Code	Code Name	Code Description
primfml	8	when subsoiled (completely remove root inhibiting soil layer)	When subsoiled (completely remove root inhibiting soil layer) are prime farmland.
primfml	9	irrigated area that the product of I (soil erodibility) and C (climate factor) does not exceed 60	Only irrigated area that the product of I (soil erodibility) and C (climate factor) does not exceed 60 are prime farmland.
rating	—	Null value indicator	
rating	1	Fair	
rating	10	Favorable	
rating	11	Limitation	
rating	2	Good	
rating	3	Moderate	
rating	4	Poor	
rating	5	Severe	
rating	6	Slight	
rating	7	Unsuited	
rating	8	Probable	
rating	9	Improbable	
reaction	01	unclassified	
reaction	02	not used	
reaction	04	acid	
reaction	06	allic	
reaction	08	dysic	
reaction	10	euic	
reaction	12	nonacid	
reaction	14	noncalcareous	
restct	–	null value indicator	
restct	1	area reclaim	
restct	10	dusty	
restct	11	erodes easily	
restct	12	excess sodium	
restct	13	excess humus	
restct	14	excess lime	
restct	15	excess salt	
restct	16	fast intake	
restct	17	favorable	
restct	18	flooding	
restct	19	frost action	
restct	2	cemented pan	
restct	20	hard to pack	
restct	21	large stones	
restct	22	low strength	
restct	23	no water	
restct	24	not needed	
restct	25	seepage	
restct	26	percs slowly	
restct	27	piping	
restct	28	poor outlets	
restct	3	complex slope	
restct	30	rooting depth	

Element	Code	Code Name	Code Description
restct	31	shrink-swell	
restct	32	slope	
restct	33	slow intake	
restct	34	slow refill	
restct	35	small stones	
restct	36	thin layer	
restct	37	too clayey	
restct	38	too sandy	
restct	39	unstable fill	
restct	4	compressible	
restct	40	wetness	
restct	41	excess fines	
restct	42	soil blowing	
restct	43	permafrost	
restct	44	pitting	
restct	45	salty water	
restct	46	subsides	
restct	47	too acid	
restct	48	ponding	
restct	49	excess sulfur	
restct	5	corrosive	
restct	50	poor filter	
restct	51	dense layer	
restct	52	fragile	
restct	53	slippage	
restct	54	variable	
restct	55	excess gypsum	
restct	56	too arid	
restct	6	cutbanks cave	
restct	7	deep to water	
restct	8	depth to rock	
restct	9	droughty	
rockhard	HARD	Hard	Hardness Class - Hard — Excavation requires blasting or special equipment.
rockhard	SOFT	Soft	Hardness Class - Soft — Excavation can be made with trenching machines, backhoes, or small rippers.
scl	2C		
scl	2E		
scl	2S		
scl	2W		
scl	3C		
scl	3E		
scl	3S		
scl	3W		
scl	4C		
scl	4E		
scl	4S		
scl	4W		
scl	5C		
scl	5E		
scl	5S		
scl	5W		
scl	6C		

Element	Code	Code Name	Code Description
scl	6E		
scl	6S		
scl	6W		
scl	7C		
scl	7E		
scl	7S		
scl	7W		
scl	8C		
scl	8E		
scl	8S		
scl	8W		
shrinksw	HIGH	High	
shrinksw	LOW	Low	
shrinksw	MODERATE	Moderate	
shrinksw	VERY HIGH	Very high	
soiltemp	01	Unclassified	
soiltemp	02	Not used	
soiltemp	03	Cryic	
soiltemp	04	Frigid	
soiltemp	06	Hyperthermic	
soiltemp	08	Isofrigid	
soiltemp	10	Isohyperthermic	
soiltemp	12	Isomesic	
soiltemp	14	Isothermic	
soiltemp	16	Mesic	
soiltemp	17	Pergelic	
soiltemp	18	Thermic	
soiltemp	20	Cryic	
soiltemp	22	Pergelic	
state	AK	Alaska	
state	AL	Alabama	
state	AR	Arkansas	
state	AS	American Samoa	
state	AZ	Arizona	
state	CA	California	
state	CO	Colorado	
state	CT	Connecticut	
state	CZ	Canal Zone	
state	DC	District of Columbia	
state	DE	Delaware	
state	FL	Florida	
state	FM	Federated States of Micronesia	
state	FN	Foreign	
state	GA	Georgia	
state	GU	Guam	
state	HI	Hawaii	
state	IA	Iowa	
state	ID	Idaho	
state	IL	Illinois	
state	IN	Indiana	
state	KS	Kansas	
state	KY	Kentucky	

Element	Code	Code Name	Code Description
state	LA	Louisiana	
state	MA	Massachusetts	
state	MD	Maryland	
state	ME	Maine	
state	MH	Marshall Islands	
state	MI	Michigan	
state	MN	Minnesota	
state	MO	Missouri	
state	MP	Northern Mariana Islands	
state	MS	Mississippi	
state	MT	Montana	
state	NC	North Carolina	
state	ND	North Dakota	
state	NE	Nebraska	
state	NH	New Hampshire	
state	NJ	New Jersey	
state	NM	New Mexico	
state	NV	Nevada	
state	NY	New York	
state	OH	Ohio	
state	OK	Oklahoma	
state	OR	Oregon	
state	PA	Pennsylvania	
state	PR	Puerto Rico	
state	PW	Palau	
state	RI	Rhode Island	
state	SC	South Carolina	
state	SD	South Dakota	
state	TN	Tennessee	
state	TX	Texas	
state	UM	U.S. Minor Outlying Islands	
state	UT	Utah	
state	VA	Virginia	
state	VI	Virgin Islands	
state	VT	Vermont	
state	WA	Washington	
state	WI	Wisconsin	
state	WV	West Virginia	
state	WY	Wyoming	
subgroup	AA	typic	
subgroup	AB	abruptic	
subgroup	AB04	abruptic aridic	
subgroup	AB08	abruptic cryic	
subgroup	AB10	abruptic haplic	
subgroup	AB14	abruptic udic	
subgroup	AB16	abruptic xerollic	
subgroup	AC	acric	
subgroup	AC05	acric plinthic	old code - This code is outdated and should no longer be used.
subgroup	AE	aeric	
subgroup	AE03	aeric arenic	old code - This code is outdated and should no longer be used.

Element	Code	Code Name	Code Description
subgroup	AE05	aeric grossarenic	old code - This code is outdated and should no longer be used.
subgroup	AE06	aeric humic	
subgroup	AE08	aeric mollic	old code - This code is outdated and should no longer be used.
subgroup	AE09	aeric tropic	
subgroup	AE10	aeric umbric	
subgroup	AE12	aeric xeric	old code - This code is outdated and should no longer be used.
subgroup	AL	albaquic	
subgroup	AL02	albaquultic	
subgroup	AL04	albic	
subgroup	AL08	albic glossic	
subgroup	AL09	albollic	
subgroup	AL10	alfic	
subgroup	AL12	alfic arenic	
subgroup	AL13	alfic andeptic	old code - This code is outdated and should no longer be used.
subgroup	AL14	alfic humic	
subgroup	AL14	ruptic-alfic lithic	old code - This code is outdated and should no longer be used.
subgroup	AL16	alfic lithic	
subgroup	AL20	alic	
subgroup	AL22	alic aquic	
subgroup	AL24	alic pachic	
subgroup	AL26	alic thaptic	
subgroup	AN	andic	
subgroup	AN01	andeptic	old code - This code is outdated and should no longer be used.
subgroup	AN03	andaquic	old code - This code is outdated and should no longer be used.
subgroup	AN06	andic dystric	old code - This code is outdated and should no longer be used.
subgroup	AN08	andic epiaquic	old code - This code is outdated and should no longer be used.
subgroup	AN08	andic ombroaquic	
subgroup	AN11	andeptic glossoboric	old code - This code is outdated and should no longer be used.
subgroup	AN12	andic udic	old code - This code is outdated and should no longer be used.
subgroup	AN22	andic ustic	old code - This code is outdated and should no longer be used.
subgroup	AN24	andaqueptic	old code - This code is outdated and should no longer be used.
subgroup	AN25	anionic	
subgroup	AN26	anionic aquic	
subgroup	AN28	anthraquic	
subgroup	AN30	anthropic	
subgroup	AQ	aqualfic	
subgroup	AQ01	aquandic	
subgroup	AQ02	aquentic	
subgroup	AQ04	aqueptic	
subgroup	AQ06	aquic	
subgroup	AQ07	aquic anionic	old code - This code is outdated and should no longer be used.

Element	Code	Code Name	Code Description
subgroup	AQ08	aquic arenic	
subgroup	AQ14	aquic duric	
subgroup	AQ16	aquic durorthidic	
subgroup	AQ18	aquic dystric	
subgroup	AQ24	aquic haplic	
subgroup	AQ26	aquic lithic	
subgroup	AQ28	aquic petroferric	
subgroup	AQ31	aquic psammentic	old code - This code is outdated and should no longer be used.
subgroup	AQ32	aquodic	
subgroup	AQ34	aquollic	
subgroup	AQ36	aquultic	
subgroup	AQ38	aquertic	
subgroup	AR	arenic	
subgroup	AR02	arenic aridic	
subgroup	AR03	arenic orthoxic	old code - This code is outdated and should no longer be used.
subgroup	AR04	arenic plinthaquic	
subgroup	AR06	arenic plinthic	
subgroup	AR08	arenic rhodic	
subgroup	AR10	arenic ultic	
subgroup	AR14	arenic umbric	
subgroup	AR16	arenic ustalfic	
subgroup	AR18	arenic ustollic	
subgroup	AR22	argiaquic	
subgroup	AR24	argiaquic xeric	
subgroup	AR26	argic	
subgroup	AR27	argixerollic	old code - This code is outdated and should no longer be used.
subgroup	AR28	argic lithic	
subgroup	AR30	argic pachic	
subgroup	AR32	argic vertic	
subgroup	AR33	argidic	old code - This code is outdated and should no longer be used.
subgroup	AR34	aridic	
subgroup	AR36	aridic calcic	
subgroup	AR42	aridic duric	
subgroup	AR50	aridic pachic	old code - This code is outdated and should no longer be used.
subgroup	AR52	aridic petrocalcic	
subgroup	AR54	argic ustic	
subgroup	AX	acrudoxic	
subgroup	AX02	acrudoxic hydric	
subgroup	AX03	acrudoxic plinthic	
subgroup	AX04	acrudoxic thaptic	
subgroup	AX06	acrudoxic ultic	
subgroup	AX08	acrudoxic vitric	
subgroup	AX10	acraquoxic	
subgroup	AX12	acrustoxic	
subgroup	BO	boralfic	
subgroup	BO02	boralfic lithic	
subgroup	BO04	boralfic udic	
subgroup	BO06	borollic	
subgroup	BO08	borollic glossic	

Element	Code	Code Name	Code Description
subgroup	BO10	borollic lithic	
subgroup	BO12	borollic vertic	
subgroup	CA	calcic	
subgroup	CA04	calcic pachic	
subgroup	CA05	calcic udic	
subgroup	CA06	calciorthidic	
subgroup	CA10	calcixerollic	
subgroup	CA20	cambic	
subgroup	CH	chromic	
subgroup	CH04	chromic udic	
subgroup	CH06	chromudic	old code - This code is outdated and should no longer be used.
subgroup	CR	cryic	
subgroup	CR10	cryic lithic	
subgroup	CR14	cryic pachic	
subgroup	CU	cumulic	
subgroup	CU02	cumulic udic	
subgroup	CU04	cumulic ultic	
subgroup	DU	durargidic	
subgroup	DU02	duric	
subgroup	DU04	duric histic	
subgroup	DU08	durixerollic	
subgroup	DU10	durixerollic lithic	
subgroup	DU11	durochreptic	old code - This code is outdated and should no longer be used.
subgroup	DU12	durorthidic	
subgroup	DU14	durorthidic xeric	
subgroup	DY02	dystric	
subgroup	DY03	dystric entic	
subgroup	DY04	dystric fluventic	
subgroup	DY06	dystric lithic	
subgroup	DY08	dystropeptic	old code - This code is outdated and should no longer be used.
subgroup	DY09	dystric vitric	
subgroup	EN	entic	
subgroup	EN02	entic lithic	
subgroup	EN04	entic udic	
subgroup	EN04	ruptic-entic lithic	old code - This code is outdated and should no longer be used.
subgroup	EN06	entic ultic	
subgroup	EP	epiaquic	old code - This code is outdated and should no longer be used.
subgroup	EP10	epiaquic orthoxic	old code - This code is outdated and should no longer be used.
subgroup	EU	eutric	
subgroup	EU02	eutrochreptic	
subgroup	EU04	eutropeptic	
subgroup	EU06	eutric hydric	
subgroup	EU08	eutric pachic	
subgroup	EU10	eutric thaptic	
subgroup	EU12	eutric vitric	
subgroup	FE	ferrudalfic	
subgroup	FI	fibric	
subgroup	FI02	fibric terric	
subgroup	FL02	fluvaquentic	

Element	Code	Code Name	Code Description
subgroup	FL06	fluventic	
subgroup	FL12	fluventic umbric	
subgroup	FR10	fragiaquic	
subgroup	FR18	fragic	
subgroup	GL02	glossaquic	
subgroup	GL04	glossic	
subgroup	GL10	glossic udic	
subgroup	GL12	glossic ustollic	
subgroup	GL14	glossoboralfic	old code - This code is outdated and should no longer be used.
subgroup	GL16	glossoboric	
subgroup	GR	grossarenic	
subgroup	GR01	grossarenic entic	
subgroup	GR04	grossarenic plinthic	
subgroup	GY	gypsic	
subgroup	HA	haplaquodic	old code - This code is outdated and should no longer be used.
subgroup	HA01	haplaquic	old code - This code is outdated and should no longer be used.
subgroup	HA02	haplic	
subgroup	HA04	halic	
subgroup	HA07	haploxerollic	
subgroup	HA09	hapludic	
subgroup	HA12	hapludollic	old code - This code is outdated and should no longer be used.
subgroup	HA16	haplustollic	
subgroup	HE	hemic	
subgroup	HE02	hemic terric	
subgroup	HI	histic	
subgroup	HI02	histic lithic	
subgroup	HI06	histic pergelic	
subgroup	HU	humic	
subgroup	HU02	humic lithic	old code - This code is outdated and should no longer be used.
subgroup	HU05	humic pergelic	
subgroup	HU06	humoxic	old code - This code is outdated and should no longer be used.
subgroup	HU10	humaqueptic	
subgroup	HU15	humic rhodic	
subgroup	HU20	humic xanthic	
subgroup	HU22	humic xeric	
subgroup	HY	hydric	
subgroup	HY02	hydric lithic	
subgroup	HY04	hydric pachic	
subgroup	HY06	hydric thaptic	
subgroup	HY10	hydraquentic	
subgroup	IN	inceptic	
subgroup	KA	kandic	
subgroup	KA02	kandiudalfic	
subgroup	KA04	kandiustalfic	
subgroup	KH	kanhaplic	
subgroup	LE	leptic	
subgroup	LE04	leptic udic	
subgroup	LI	limnic	
subgroup	LI02	lithic	

Element	Code	Code Name	Code Description
subgroup	LI04	lithic mollic	
subgroup	LI05	lithic petrocalcic	
subgroup	LI06	lithic ruptic-alfic	
subgroup	LI07	lithic ruptic-argic	
subgroup	LI08	lithic ruptic-entic	old code - This code is outdated and should no longer be used.
subgroup	LI08	lithic ruptic-entic xerollic	
subgroup	LI09	lithic ruptic-entic	
subgroup	LI10	lithic udic	old code - This code is outdated and should no longer be used.
subgroup	LI11	lithic ruptic-xerorthentic	
subgroup	LI12	lithic ultic	
subgroup	LI13	lithic ruptic-ultic	
subgroup	LI14	lithic umbric	old code - This code is outdated and should no longer be used.
subgroup	LI15	lithic ruptic-xerochreptic	
subgroup	LI16	lithic ustic	
subgroup	LI18	lithic ustollic	
subgroup	LI20	lithic vertic	old code - This code is outdated and should no longer be used.
subgroup	LI22	lithic xeric	
subgroup	LI24	lithic xerollic	
subgroup	MO	mollic	
subgroup	NA06	natric	
subgroup	OC	ochreptic	
subgroup	OM	ombroaquic	
subgroup	OR	orthidic	
subgroup	OR01	orthic	old code - This code is outdated and should no longer be used.
subgroup	OR02	orthoxic	old code - This code is outdated and should no longer be used.
subgroup	OX	oxic	
subgroup	OX02	oxyaquic	
subgroup	PA	pachic	
subgroup	PA02	pachic udic	
subgroup	PA04	pachic ultic	
subgroup	PA06	pachic vitric	
subgroup	PA08	paleustollic	old code - This code is outdated and should no longer be used.
subgroup	PA10	palexerollic	old code - This code is outdated and should no longer be used.
subgroup	PA20	paralithic vertic	old code - This code is outdated and should no longer be used.
subgroup	PE	pergelic	
subgroup	PE01	pergelic ruptic-histic	
subgroup	PE02	pergelic sideric	old code - This code is outdated and should no longer be used.
subgroup	PE04	petrocalcic	
subgroup	PE06	petrocalcic ustalfic	
subgroup	PE08	petrocalcic ustollic	
subgroup	PE14	petrocalcic xerollic	
subgroup	PE16	petroferric	
subgroup	PE20	petrogypsic	
subgroup	PK	placic	
subgroup	PK10	plaggeptic	

Element	Code	Code Name	Code Description
subgroup	PK12	plaggic	old code - This code is outdated and should no longer be used.
subgroup	PL	plinthaquic	
subgroup	PL04	plinthic	
subgroup	PL06	plinthudic	
subgroup	PS	psammaquentic	
subgroup	PS02	psammentic	
subgroup	QU	quartzipsammentic	
subgroup	RE	rendollic	
subgroup	RH	rhodic	
subgroup	RU02	ruptic-alfic	
subgroup	RU09	ruptic-lithic	
subgroup	RU11	ruptic-lithic-entic	
subgroup	RU15	ruptic-lithic-xerochreptic	
subgroup	RU17	ruptic-ultic	
subgroup	RU19	ruptic-vertic	
subgroup	SA	salorthidic	
subgroup	SA02	sapric	
subgroup	SA04	sapric terric	
subgroup	SI	sideric	old code - This code is outdated and should no longer be used.
subgroup	SO	sombric	
subgroup	SO02	sodic	
subgroup	SO04	sombrihumic	old code - This code is outdated and should no longer be used.
subgroup	SP	sphagnic	
subgroup	SP02	sphagnic terric	
subgroup	SP04	spodic	
subgroup	SU	sulfic	
subgroup	SU02	sulfaqueptic	
subgroup	TE	terric	
subgroup	TH	thaptic	
subgroup	TH04	thapto-histic	
subgroup	TH06	thapto-histic tropic	
subgroup	TO	torrertic	
subgroup	TO02	torrifluventic	
subgroup	TO04	torriorthentic	
subgroup	TO06	torripsammentic	
subgroup	TO10	torroxic	
subgroup	TR	tropaquodic	old code - This code is outdated and should no longer be used.
subgroup	TR02	tropeptic	old code - This code is outdated and should no longer be used.
subgroup	TR04	tropic	
subgroup	U15	humic rhodic	old code - This code is outdated and should no longer be used.
subgroup	UD	udertic	
subgroup	UD01	udalfic	old code - This code is outdated and should no longer be used.
subgroup	UD02	udic	
subgroup	UD03	udollic	
subgroup	UD05	udorthentic	
subgroup	UD07	udandic	
subgroup	UD08	udifluventic	
subgroup	UD10	udoxic	
subgroup	UL	ultic	

Element	Code	Code Name	Code Description
subgroup	UL02	ultic vitric	old code - This code is outdated and should no longer be used.
subgroup	UM	umbreptic	
subgroup	UM02	umbric	
subgroup	US	ustalfic	
subgroup	US01	ustandic	
subgroup	US02	ustertic	
subgroup	US04	ustic	
subgroup	US05	ustivitrandic	
subgroup	US06	ustochreptic	
subgroup	US08	ustollic	
subgroup	US12	ustoxic	
subgroup	VE	vermic	
subgroup	VE02	vertic	
subgroup	VI	vitric	
subgroup	VI02	vitrandic	
subgroup	VI04	vitrustandic	old code - This code is outdated and should no longer be used.
subgroup	VI06	vitritorrandic	
subgroup	VI08	vitrixerandic	
subgroup	XA	xanthic	
subgroup	XE	xeralfic	
subgroup	XE02	xerertic	
subgroup	XE04	xeric	
subgroup	XE08	xerollic	
subgroup	XE10	xerochreptic	
suborder	AAQ	Aqualfs	
suborder	ABO	Boralfs	
suborder	AUD	Udalfs	
suborder	AUS	Ustalfs	
suborder	AXE	Xeralfs	
suborder	CAQ	Aquands	
suborder	CCR	Cryands	
suborder	CTO	Torrands	
suborder	CUD	Udands	
suborder	CUS	Ustands	
suborder	CVI	Vitrands	
suborder	CXE	Xerands	
suborder	DAR	Argids	
suborder	DOR	Orthids	
suborder	EAQ	Aquents	
suborder	EAR	Arents	
suborder	EFL	Fluvents	
suborder	EOR	Orthents	
suborder	EPS	Psamments	
suborder	HFI	Fibrists	
suborder	HFO	Folists	
suborder	HHE	Hemists	
suborder	HSA	Saprists	
suborder	IAN	Andepts	
suborder	IAQ	Aquepts	
suborder	IOC	Ochrepts	
suborder	IPL	Plaggepts	
suborder	ITR	Tropepts	
suborder	IUM	Umbrepts	

Element	Code	Code Name	Code Description
suborder	MAL	Albolls	
suborder	MAQ	Aquolls	
suborder	MBO	Borolls	
suborder	MRE	Rendolls	
suborder	MUD	Udolls	
suborder	MUS	Ustolls	
suborder	MXE	Xerolls	
suborder	OAQ	Aquox	
suborder	OHU	Humox	
suborder	OOR	Orthox	
suborder	OPR	Perox	
suborder	OTO	Torrox	
suborder	OUD	Udox	
suborder	OUS	Ustox	
suborder	SAQ	Aquods	
suborder	SCR	Cryods	
suborder	SFE	Ferrods	
suborder	SHU	Humods	
suborder	SOR	Orthods	
suborder	UAQ	Aquults	
suborder	UHU	Humults	
suborder	UUD	Udults	
suborder	UUS	Ustults	
suborder	UXE	Xerults	
suborder	VAQ	Aquerts	
suborder	VCR	Cryerts	
suborder	VTO	Torrerts	
suborder	VUD	Uderts	
suborder	VUS	Usterts	
suborder	VXE	Xererts	
suitcode	E	Existing	Plant exists (is common) on the site.
suitcode	EP	Existing Potential	Plant exists (is commom) on the site and has potential for planting on the site as a tree crop.
suitcode	P	Potential	Plant has potential as a species for planting on the site as a tree crop.
texture	APUM	ashy-pumiceous	
texture	ASHY	ashy	
texture	ASK	ashy-skeletal	
texture	BM	bouldery mucky	
texture	BVM	very bouldery mucky	
texture	BXM	extremely bouldery mucky	
texture	BY	bouldery	
texture	BYV	very bouldery	
texture	BYX	extremely bouldery	
texture	C	clay	
texture	CAM	angular cobbly mucky	
texture	CB	cobbly	
texture	CBA	angular cobbly	
texture	CBV	very cobbly	
texture	CBX	extremely cobbly	
texture	CE	coprogenous earth	
texture	CEM	cemented	

Element	Code	Code Name	Code Description
texture	CIND	cinders	
texture	CL	clay loam	
texture	CM	cobbly mucky	
texture	CN	channery	
texture	CNDY	cindery	
texture	CNV	very channery	
texture	CNX	extremely channery	
texture	COS	coarse sand	
texture	COSL	coarse sandy loam	
texture	CR	cherty	
texture	CRC	coarse cherty	
texture	CRV	very cherty	
texture	CRX	extremely cherty	
texture	CVM	very cobbly mucky	
texture	CXM	extremely cobbly mucky	
texture	DE	diatomaceous earth	
texture	FB	fibric material	
texture	FL	flaggy	
texture	FLV	very flaggy	
texture	FLX	extremely flaggy	
texture	FRAG	fragmental material	
texture	FS	fine sand	
texture	FSL	fine sandy loam	
texture	G	gravel	
texture	GCM	coarse gravelly mucky	
texture	GFM	fine gravelly mucky	
texture	GM	gravelly mucky	
texture	GR	gravelly	
texture	GRC	coarse gravelly	
texture	GRF	fine gravelly	
texture	GRV	very gravelly	
texture	GRX	extremely gravelly	
texture	GVM	very gravelly mucky	
texture	GXM	extremely gravelly mucky	
texture	GYP	gypsiferous material	
texture	HM	hemic material	
texture	HPUM	hydrous-pumiceous	
texture	HSK	hydrous-skeletal	
texture	HYDR	hydrous	
texture	ICE	ice or frozen soil	
texture	IND	indurated	
texture	L	loam	
texture	LCOS	loamy coarse sand	
texture	LFS	loamy fine sand	
texture	LS	loamy sand	
texture	LVFS	loamy very fine sand	
texture	MARL	marl	
texture	MEDL	medial	
texture	MK	mucky	
texture	MPT	mucky-peat	
texture	MPUM	medial-pumiceous	
texture	MSK	medial-skeletal	
texture	MUCK	muck	
texture	PEAT	peat	
texture	PT	peaty	

Element	Code	Code Name	Code Description
texture	PUM	pumiceous	
texture	RB	rubbly	
texture	S	sand	
texture	SC	sandy clay	
texture	SCL	sandy clay loam	
texture	SG	sand and gravel	
texture	SH	shaly	
texture	SHV	very shaly	
texture	SHX	extremely shaly	
texture	SI	silt	
texture	SIC	silty clay	
texture	SICL	silty clay loam	
texture	SIL	silt loam	
texture	SL	sandy loam	
texture	SM	stony mucky	
texture	SP	sapric material	
texture	SR	stratified	
texture	ST	stony	
texture	STV	very stony	
texture	STX	extremely stony	
texture	SVM	very stony mucky	
texture	SXM	extremely stony mucky	
texture	SY	slaty	
texture	SYV	very slaty	
texture	SYX	extremely slaty	
texture	UNK	unknown	
texture	UWB	unweathered bedrock	
texture	VAR	variable	
texture	VFS	very fine sand	
texture	VFSL	very fine sandy loam	
texture	WB	weathered bedrock	
unified	CH	Group Symbol - CH	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.
unified	CL	Group Symbol - CL	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay.
unified	CL-A	Group Symbol - CL-A	Andic suffix for CL.
unified	CL-K	Group Symbol - CL-K	Kaolinitic suffix for CL.
unified	CL-ML	Group Symbol - CL-ML	
unified	CL-O	Group Symbol - CL-O	Oxidic suffix for CL
unified	CL-T	Group Symbol - CL-T	Thixotropic suffix for CL.
unified	GC	Group Symbol - GC	COARSE-GRAINED SOILS ,Gravels, Gravels with fines, Clayey Gravel.
unified	GM	Group Symbol - GM	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Silty Gravel.
unified	GM-GC	Group Symbol - GM-GC	

Element	Code	Code Name	Code Description
unified	GP	Group Symbol - GP	COARSE-GRAINED SOILS, Gravels, Clean gravels, Poorly Graded Gravel.
unified	GP-GC	Group Symbol - GP-GC	
unified	GP-GM	Group Symbol - GP-GM	
unified	GW	Group Symbol - GW	COARSE-GRAINED SOIlLS, Gravels, Clean Gravels, Well-graded gravel.
unified	GW-GC	Group Symbol - GW-GC	
unified	GW-GM	Group Symbol - GW-GM	
unified	MH	Group Symbol - MH	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Elastic silt.
unified	MH-A	Group Symbol - MH-A	Andic suffix for MH.
unified	MH-K	Group Symbol - MH-K	Kaolinitic suffix for MH.
unified	MH-O	Group Symbol - MH-O	Oxidic suffix for MH.
unified	MH-T	Group Symbol - MH-T	Thixotropic suffix for MH.
unified	ML	Group Symbol - ML	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Silt.
unified	ML-A	Group Symbol - ML-A	Andic suffix for ML.
unified	ML-K	Group Symbol - ML-K	Kaolinitic suffix for ML.
unified	ML-O	Group Symbol - ML-O	Oxidic suffix for ML.
unified	ML-T	Group Symbol - ML-T	Thixotropic suffix for ML.
unified	OH	Group Symbol - OH	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Organic Clay or Organic Silt.
unified	OH-T	Group Symbol - OH-T	Thixotropic suffix for OH.
unified	OL	Group Symbol - OL	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Organic Clay or Organic Silt.
unified	PT	Group Symbol - PT	Highly organic soils, Peat.
unified	SC	Group Symbol - SC	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.
unified	SC-SM	Group Symbol - SC-SM	
unified	SM	Group Symbol - SM	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.

Element	Code	Code Name	Code Description
unified	SM-SC	Group Symbol - SM-SC	
unified	SP	Group Symbol - SP	COARSE-GRAINED SOILS, Sands, Clean Sands, Poorly graded sand.
unified	SP-SC	Group Symbol - SP-SC	
unified	SP-SM	Group Symbol - SP-SM	
unified	SW	Group Symbol - SW	COARSE-GRAINED SOILS, Sands, Clean Sands, Well-graded sand.
unified	SW-SC	Group Symbol - SW-SC	
unified	SW-SM	Group Symbol - SW-SM	
unitkind	FAMILY	family	
unitkind	FAMPHS	family phase	
unitkind	GRTGRP	great group	
unitkind	MISC	miscellaneous	
unitkind	SERIES	series	
unitkind	SUBGRP	subgroup	
unitkind	SUBORD	suborder	
unitkind	VAR	variant	
weg	1	Wind Erodibility Group 1	Surface texture - VFS,FS,S,COS. Percent aggregates - 1, Wind erodibility index 310 t/a/y.
weg	2	Wind Erodibility Group 2	Surface texture - LVFS,LFS,LCOS,Sapric material. Percent aggregates - 10, Wind erodibility index - 134 t/a/y.
weg	3	Wind Erodibility Group 3	Surface texture - VFSL,FSL,SL,COSL. Percent aggregates - 25, Wind erodibility index - 86 t/a/y.
weg	4	Wind Erodibility Group 4	Surface Texture - C,SIC,noncalcareous CL,SICL(>35% CLAY). Percent aggregates - 25, Wind erodibility index 86 t/a/y.
weg	4L	Wind Erodibility Group 4L	Surface texture - calcareous L/SIL/CL,SICL. Percent aggregates - 25, Wind Erodibility index - 86 t/a/y.
weg	5	Wind Erodibility Group 5	Surface textue - noncalcareous L/SIL(<20% CLAY),SCL,SC. Percent aggregates - 40, Wind erodibility index 56 t/a/y.
weg	6	Wind Erodibility Group 6	Surface texture - noncalcareous L/SIL(>20% CLAY),CL(<35% CLAY). Percent aggregates - 45, Wind erodibility index - 48 t/a/y.

Element	Code	Code Name	Code Description
weg	7	Wind Erodibility Group 7	Surface texture - SI,noncalcareous SICL(<35% CLAY). Percent aggregates 50, Wind erodibility index - 38 t/a/y.
weg	8	Wind Erodibility Group 8	Erosion not a problem.
wei	0		
wei	134		
wei	160		
wei	180		
wei	220		
wei	250		
wei	310		
wei	38		
wei	48		
wei	56		
wei	86		
wtkind	APPAR	Apparent	Apparent water table — Water stands in a freshly dug hole.
wtkind	ARTES	Artesian	Artesian water table — Water with an hydrostatic head below an impermeable layer.
wtkind	PERCH	Perched	Perched water table — Water standing above an unsaturated zone.

Appendix D: Value table

Table	Element	Column type	Column length	Precision value	Low range	High range
layer	aashind	float	3	0	0	120
layer	aashto	char	25			
comp	anflobeg	char	3			
comp	anflodur	char	11			
comp	anfloend	char	3			
comp	anflood	char	5			
layer	awch	float	1	2	0	0.7
layer	awcl	float	1	2	0	0.7
layer	bdh	float	1	2	0.05	2.35
layer	bdl	float	1	2	0.05	2.35
layer	caco3h	int	3	0	0	110
layer	caco3l	int	3	0	0	110
layer	cech	float	3	1	0	400
layer	cecl	float	3	1	0	400
comp	clascode	char	20			
taxclass	clascode	char	20			
taxclass	class	char	120			
layer	clayh	int	3	0	0	100
layer	clayl	int	3	0	0	100
comp	clirr	char	1			
comp	clnirr	char	1			
plantnm	comname	char	35			
comp	compacre	int	6	0	0	999999
comp	compkind	char	1			
comp	compname	char	35			
comp	comppct	int	3	0	1	100
comp	corcon	char	8			
comp	corsteel	char	8			
compyld	cropname	char	30			
yldunits	cropname	char	30			
comp	drainage	char	5			
comp	frostact	char	8			
interp	grpcode	char	2			
taxclass	grtgroup	char	5			
comp	gsflobeg	char	3			
comp	gsflodur	char	11			
comp	gsfloend	char	3			
comp	gsflood	char	5			
layer	gypsumh	int	2	0	0	99
layer	gypsuml	int	2	0	0	99
comp	hydgrp	char	3			
comp	hydric	char	1			
layer	inch10h	int	2	0	0	99
layer	inch10l	int	2	0	0	99
layer	inch3h	int	2	0	0	99
layer	inch3l	int	2	0	0	99
compyld	irryld	float	4	2	0	9999.99
layer	kfact	float	0	2		

Table	Element	Column type	Column length	Precision value	Low range	High range
layer	kffact	float	0	2		
layer	laydeph	int	2	0	0	99
layer	laydepl	int	2	0	0	99
layer	layerid	int	3	0		
layer	layernum	int	2	0		
layer	llh	int	3	0	0	999
layer	lll	int	3	0	0	999
taxclass	minalogy	char	2			
mapunit	mlra	char	4			
mapunit	muacres	int	6	0	0	999999
comp	muid	char	8			
compyld	muid	char	8			
forest	muid	char	8			
interp	muid	char	8			
layer	muid	char	8			
mapunit	muid	char	8			
plantcom	muid	char	8			
rsprod	muid	char	8			
windbrk	muid	char	8			
wlhabit	muid	char	8			
woodland	muid	char	8			
woodmgt	muid	char	8			
mapunit	mukind	char	1			
mapunit	muname	char	130			
comp	musym	char	5			
mapunit	musym	char	5			
compyld	nirryld	float	4	2	0	9999.99
layer	no10h	int	3	0	0	100
layer	no10l	int	3	0	0	100
layer	no200h	int	3	0	0	100
layer	no200l	int	3	0	0	100
layer	no40h	int	3	0	0	100
layer	no40l	int	3	0	0	100
layer	no4h	int	3	0	0	100
layer	no4l	int	3	0	0	100
layer	omh	float	3	1	0	100
layer	oml	float	3	1	0	100
taxclass	order	char	1			
woodmgt	ordsym	char	3		0	50
taxclass	otherfam	char	2			
comp	otherph	char	40			
comp	pandeph	int	2	0	0	72
comp	pandepl	int	2	0	0	72
comp	panhard	char	5			
taxclass	partsize	char	3			
layer	permh	float	2	2	0	63
layer	perml	float	2	2	0	63
layer	phh	float	2	1	2	11
layer	phl	float	2	1	2	11
layer	pih	int	2	0	0	130
layer	pil	int	2	0	0	130
forest	plantcov	int	3	0	0	100
plantcom	plantpct	int	3	0	0	100
forest	plantsym	char	8			

Table	Element	Column type	Column length	Precision value	Low range	High range
plantcom	plantsym	char	8			
plantnm	plantsym	char	8			
windbrk	plantsym	char	8			
woodland	plantsym	char	8			
comp	pndbeg	char	3			
comp	pnddeph	float	2	1	-6	6
comp	pnddepl	float	2	1	-6	6
comp	pnddur	char	11			
comp	pndend	char	3			
mapunit	primfml	char	1			
rsprod	prodfav	int	5	0	0	20000
rsprod	prodnorm	int	5	0	0	20000
rsprod	produnfv	int	5	0	0	20000
interp	rating	char	2			
taxclass	reaction	char	2			
interp	restct1	char	2			
interp	restct2	char	2			
interp	restct3	char	2			
comp	rockdeph	int	2	0	0	99
comp	rockdepl	int	2	0	0	99
comp	rockhard	char	5			
rsprod	rsid	char	10			
rsprod	rsname	char	100			
comp	s5id	char	6			
layer	s5id	char	6			
layer	salinh	int	3	0	0	999
layer	salinl	int	3	0	0	999
layer	sarh	float	3	0	0	999
layer	sarl	float	3	0	0	999
plantnm	sciname	char	45			
comp	sclirr	char	2			
comp	sclnirr	char	2			
comp	seqnum	int	1	0		
compyld	seqnum	int	1	0		
forest	seqnum	int	1	0		
interp	seqnum	int	1	0		
layer	seqnum	int	1	0		
plantcom	seqnum	int	1	0		
rsprod	seqnum	int	1	0		
windbrk	seqnum	int	1	0		
wlhabit	seqnum	int	1	0		
woodland	seqnum	int	1	0		
woodmgt	seqnum	int	1	0		
layer	shrinksw	char	9			
woodland	sitind	int	3	0	15	250
comp	slopeh	int	3	0	0	999
comp	slopel	int	3	0	0	999
taxclass	soiltemp	char	2			
mapunit	ssaid	char	3		1	999
comp	stssaid	char	5			
compyld	stssaid	char	5			
forest	stssaid	char	5			
interp	stssaid	char	5			
layer	stssaid	char	5			

Table	Element	Column type	Column length	Precision ralue	Low range	High range
mapunit	stssaid	char	5			
plantcom	stssaid	char	5			
rsprod	stssaid	char	5			
windbrk	stssaid	char	5			
wlhabit	stssaid	char	5			
woodland	stssaid	char	5			
woodmgt	stssaid	char	5			
taxclass	subgroup	char	4			
comp	subinith	int	2	0	0	99
comp	subinitl	int	2	0	0	99
taxclass	suborder	char	3			
comp	subtoth	int	2	0	0	99
comp	subtotl	int	2	0	0	99
woodland	suitcode	char	2			
comp	surftex	char	8			
layer	texture	char	26			
layer	tfact	int	1	0	1	5
layer	unified	char	20			
woodmgt	wdequip	char	8			
woodmgt	wderosn	char	8			
woodmgt	wdplant	char	8			
woodmgt	wdseed	char	8			
woodmgt	wdwind	char	8			
layer	weg	char	2			
layer	wei	int	3	0		
wlhabit	wlconif	char	9			
wlhabit	wlgrain	char	9			
wlhabit	wlgrass	char	9			
wlhabit	wlhard	char	9			
wlhabit	wlherb	char	9			
wlhabit	wlopen	char	9			
wlhabit	wlrange	char	9			
wlhabit	wlshlwat	char	9			
wlhabit	wlshrub	char	9			
wlhabit	wlwet	char	9			
wlhabit	wlwetplt	char	9			
wlhabit	wlwood	char	9			
windbrk	wndbrkht	int	2	0	1	99
woodland	woodprod	int	2	0	0	50
comp	wtbeg	char	3			
comp	wtdeph	float	2	1	-6	6
comp	wtdepl	float	2	1	-6	6
comp	wtend	char	3			
comp	wtkind	char	5			
yldunits	yldunits	char	9			