Introduction

The U.S. Department of Agriculture's (USDA) 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

SCS 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 soil survey publications.

Line segments (vectors) are digitized in accordance with specifications and standards established by the SCS for duplicating the original soil survey map. The mapping bases are normally orthophotoquads, and digitizing is performed by SCS, 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 SCS-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 understanding the relationship of map scale, accuracy, and detail are important.

Use of STATSGO data

STATSGO interpretive maps

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.

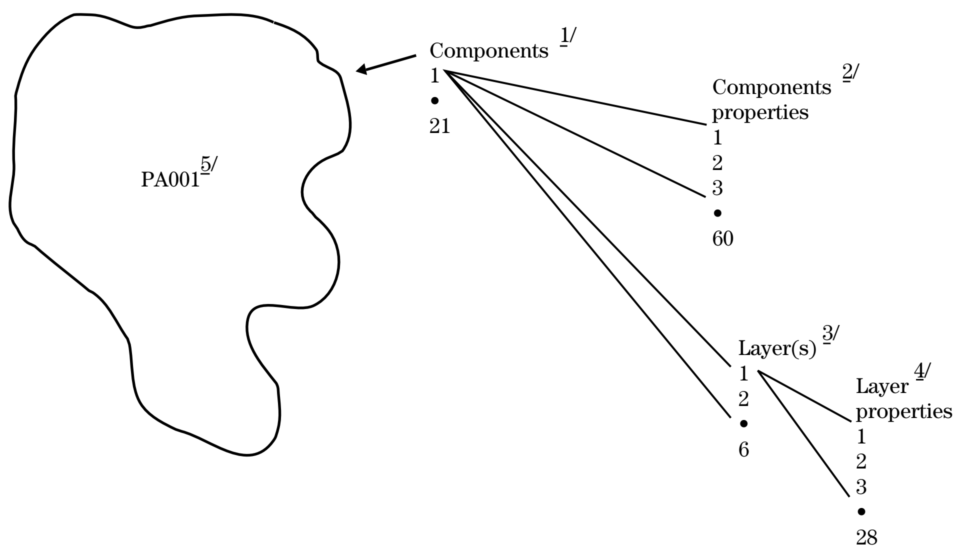
Visual orientation can be provided by using additional data files. For STATSGO interpretative maps and for many other natural resource interpretive maps, a shaded relief background provides visual reference of the topography that is easily understood. An example is the shaded relief background image 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*



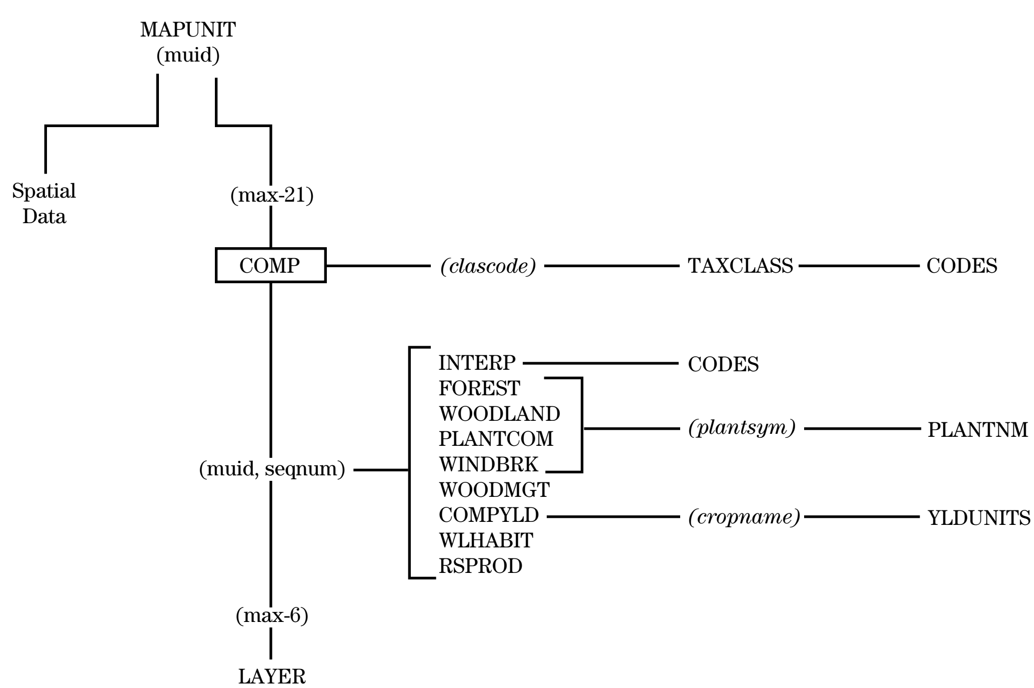
[1]STATSGO map units consist of 1 to 21 components.
[2]For each component, there are 60 soil properties and interpretations in 84 different data elements (component tables), for example, flooding.
[3]For each component, there are 1 to 6 soil layers.
[4]For each layer, there are 28 soil properties; for 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 SCS [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 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.

Data collection

Specifications used for compiling STATSGO

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

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

Map units

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. SCS State staffs will submit their verification procedures to their National Technical Center (NTC) 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.

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.

Procedures used for digitizing STATSGO

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
Point	Water	PAW
Point	Area beyond data and within quadrangle	NODATA

Data capture

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.

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**.

Quality control

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 discreprencies 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 SCS 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

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.

Data structure

Projection information

Map information for the STATSGO data base was captured as 1:250,000 scale USGS topgographic 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

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.

Digital Line Graph

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

Digital Line Graph attribute file

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
101 PA103
102 PA104
103 PA105
104 PA106
```

ARC/INFO export

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
```

Attribute data distribution formats

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

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.

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

Attribute (tabular) data

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 coded field information
- **comp** (Soil component) stores soil component information
- **compyld** (component crop yield) stores crop yield information for soil components
- **forest** (forest understory) stores forest understory information for soil components
- **interp** (interpretations for engineering uses) stores interpretive ratings and restrictive features for engineering uses for soil components
- **layer** (soil layer) stores soil properties on soil layers for soil components
- **mapunit** (Soil) stores information which applies to an entire soil
- **plantcom** (plant composition) stores plant symbols and composition percentages for soil components
- **plantnm** (plant name) stores the common and scientific plant names for plants listed in the data base
- **rsprod** (range site production) stores range site productivity information for soil components
- **taxclass** (taxonomic class) stores the taxonomic classification for soil components
- **windbrk** (windbreak) stores recommended windbreak species information for soil components
- **wlhabit** (wildlife habitat) stores wildlife habitat information on soil components
- **woodland** (woodland) stores common indicator tree information for soil components
- **woodmgt** (woodland management) stores woodland management information on 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. Also, not all tables are relevant for all states.

Figure 3. STATSGO attribute retational data base schema

Map Unit Table

mapunit
- stssaid
- ssaid
- musym
- ***muid***
- muname
- mukind
- mlra
- primfml
- muacres

Lookup Tables

taxclass
- ***clascode***
- class
- order
- suborder
- grtgroup
- subgroup
- partsize
- minalogy
- reaction
- soiltemp
- otherfam

yldunits
- ***cropname***
- yldunits

plantnm
- ***plantsym***
- sciname
- comname

Component Tables

comp
- stssaid
- ***muid***
- musym
- compname
- ***seqnum***
- s5id
- comppct
- slopel
- slopeh
- surftex
- otherph
- compkind
- compacre
- ***clascode***
- anflood
- anflodur
- anflobeg
- anfloend
- gsflood
- gsflodur
- gsflobeg
- gsfloend
- wtdepl
- wtdeph
- wtkind
- wtbeg
- wtend
- pnddepl
- pnddeph
- pnddur
- pndbeg
- pndend
- rockdepl
- rockdeph
- rockhard
- pandepl
- pandeph
- panhard
- subinitl
- subinith
- subtotl
- subtoth
- hydgrp
- frostact
- drainage
- hydric
- corcon
- corsteel
- clnirr
- clirr
- sclnirr
- sclirr
- primfml

interp
- stssaid
- ***muid***
- ***seqnum***
- grpcode
- rating
- restct1
- restct2
- restct3

compyld
- stssaid
- ***muid***
- ***seqnum***
- cropname
- nirryld
- irryld

woodland
- stssaid
- ***muid***
- ***seqnum***
- suitcode
- ***plantsym***
- sitind
- woodprod

woodmgt
- stssaid
- ***muid***
- ***seqnum***
- ordsym
- wderosn
- wdequip
- wdseed
- wdwind
- wdplant

forest
- stssaid
- ***muid***
- ***seqnum***
- ***plantsym***
- plantcov

windbrk
- stssaid
- ***muid***
- ***seqnum***
- ***plantsym***
- wndbrkht

wlhabit
- stssaid
- ***muid***
- ***seqnum***
- wlgrain
- wlgrass
- wlherb
- wlhard
- wlconif
- wlshrub
- wlwetplt
- wlshlwat
- wlopen
- wlwood
- wlwet
- wlrange

rsprod
- stssaid
- ***muid***
- ***seqnum***
- rsid
- rsname
- prodfav
- prodnorm
- produnfv

plantcom
- stssaid
- ***muid***
- ***seqnum***
- ***plantsym***
- plantpct

Layer Table

layer
- stssaid
- ***muid***
- ***seqnum***
- s5id
- layernum
- layerid
- laydepl
- laydeph
- texture
- kfact
- kffact
- tfact
- weg
- inch10l
- inch10h
- inch3l
- inch3h
- no4l
- no4h
- no10l
- no10h
- no40l
- no40h
- no200l
- no200h
- clayl
- clayh
- lll
- llh
- pil
- pih
- unified
- aashto
- aashind
- awcl
- awch
- bdl
- bdh
- oml
- omh
- phl
- phh
- salinl
- salinh
- sarl
- sarh
- cecl
- cech
- caco3l
- caco3h
- gypsuml
- gysumh
- perml
- permh
- shrinksw

Data voids

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 Forest Service lands in some Western States. In instances where data are unavailable, a mask should be used to exclude the area from analysis.

Map hard copy production

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

> "The soil information used for this map was Soil 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."

User support

The user should be knowledgeable of soils data. If you need assistance, contact an SCS soil scientist for help. The following is a listing of SCS 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) 678-4179

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 Street, 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 Avenue
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 Federal Bldg.
Columbia, SC 29201
(803) 253-3896

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

675 Estes Kefauver, FB-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
(304) 291-4484

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

Distribution

Source

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

National Cartography and GIS Center
U.S. Department of Agriculture
Soil Conservation Service
501 Felix Street, Building 23 76115-3495
P.O. Box 6567
Fort Worth, Texas 76115-0567
(817) 334-5559
FAX (817) 334-5469

Format

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 STATSGO attribute data are available in Prelude table or ARC/INFO export formats which are described in the section, Data structure.

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

The STATSGO spatial and attribute data are distributed as one data set as a state-wide coverage.

Media

The distribution medium for spatial and attribute data is normally 9-track magnetic tape, 8 mm tape, or QIC tape. However, regional coverages of the United States that include multiple states are available on CDROM. Please call the National Cartography and GIS Center for pricing and data format information.

Ordering 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.

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

References

[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

Appendix B: Definition of soil data elements

Appendix C: Definition of soil data codes

Appendix D: Value table