

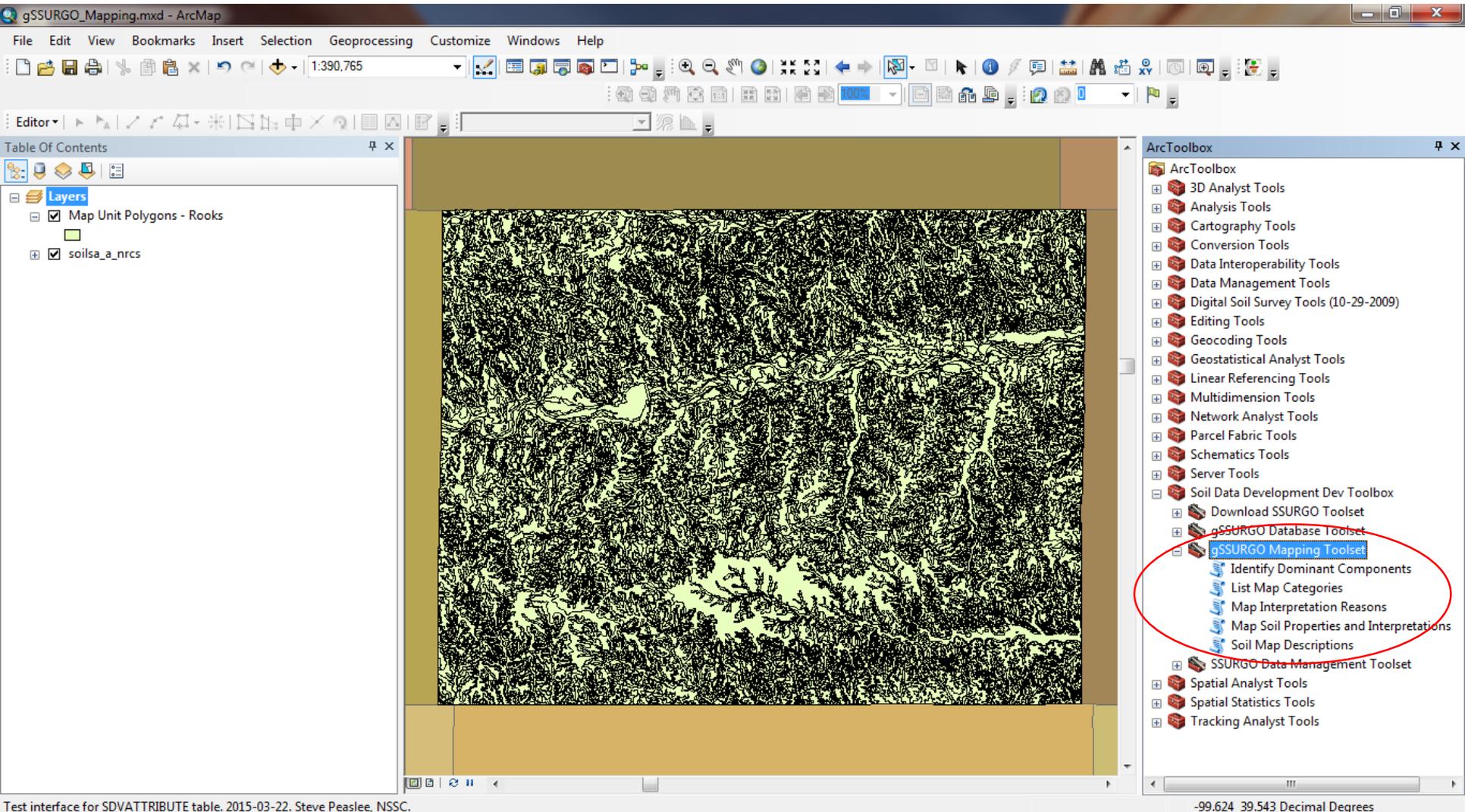
gSSURGO Mapping Toolset

(a member of the Soil Data Development Toolbox)

Individual Tools:

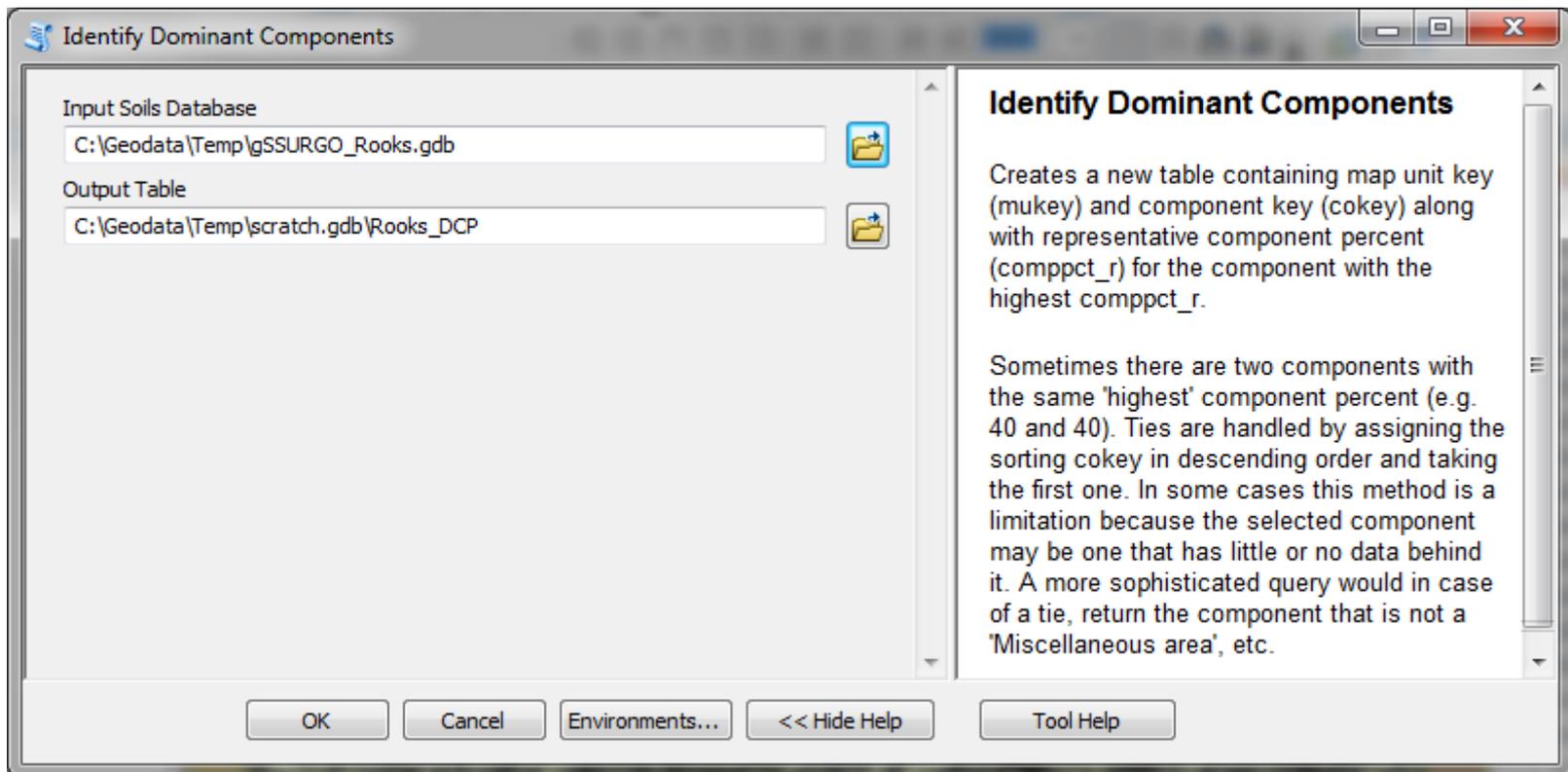
- [Identify Dominant Components](#)
- [List Map Categories](#)
- [Map Interpretation Reasons](#)
- [Map Soil Properties and Interpretations](#)

The 'gSSURGO Mapping' toolset is a part of the 'Soil Data Development' toolbox for gSSURGO. This toolbox is compatible with ArcGIS Desktop versions 10.1 – 10.3. Previously known as the 'SSURGO Download' tools.



Identify Dominant Components Tool

The 'Identify Dominant Components' tool selects the component within each map unit that has the highest component percent. The mukey, cokey and comp_pct_r values for each selected record are written to the specified table. This table can then be used to in creating simple joins between a soil map layer and the component table using the MUKEY field. All tools include Tool Help on the right side.



Table

Rooks_DCP

OBJECTID *	mukey *	cokey	compct_r
1	2876217	11805065	80
2	1150273	11804906	50
3	1150242	11805154	45
4	1150271	11805026	95
5	1150270	11805051	87
6	1150277	11805110	45
7	1150276	11805082	90
8	1150275	11805076	90
9	1150243	11805150	55
10	1150255	11804949	100
11	1150279	11804952	100
12	1150278	11804950	100
13	2496154	11804996	100
14	1150257	11804897	100
15	1150253	11804948	100

(0 out of 68 Selected)

Rooks_DCP

Join Data

Join lets you append additional data to this layer's attribute table so you can, for example, symbolize the layer's features using this data.

What do you want to join to this layer?

Join attributes from a table

- Choose the field in this layer that the join will be based on:
MUKEY
- Choose the table to join to this layer, or load the table from disk:
Rooks_DCP
 Show the attribute tables of layers in this list
- Choose the field in the table to base the join on:
mukey

Join Options

Keep all records
All records in the target table are shown in the resulting table. Unmatched records will contain null values for all fields being appended into the target table from the join table.

Keep only matching records
If a record in the target table doesn't have a match in the join table, that record is removed from the resulting target table.

Validate Join

[About joining data](#)

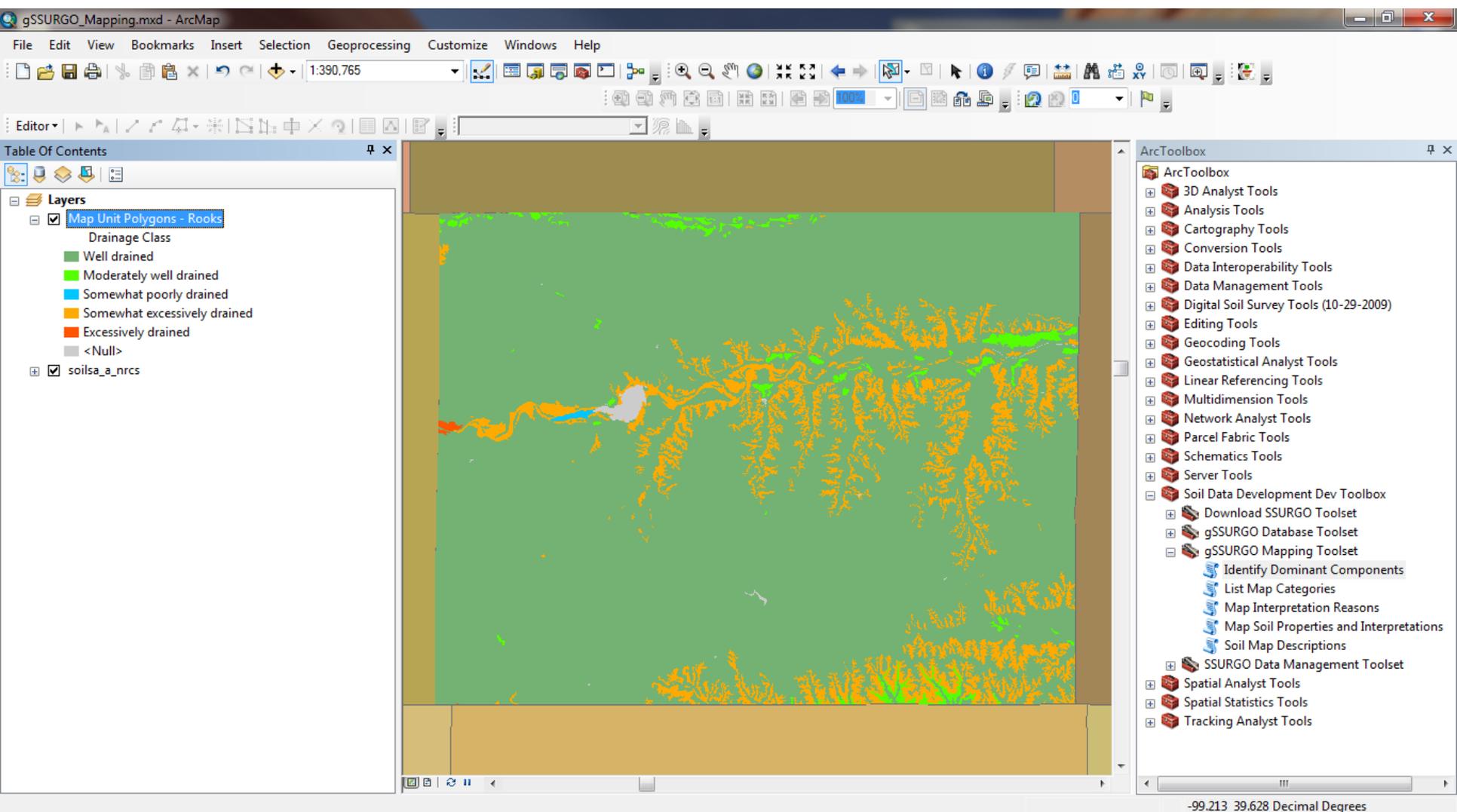
OK Cancel

Output table containing dominant component.

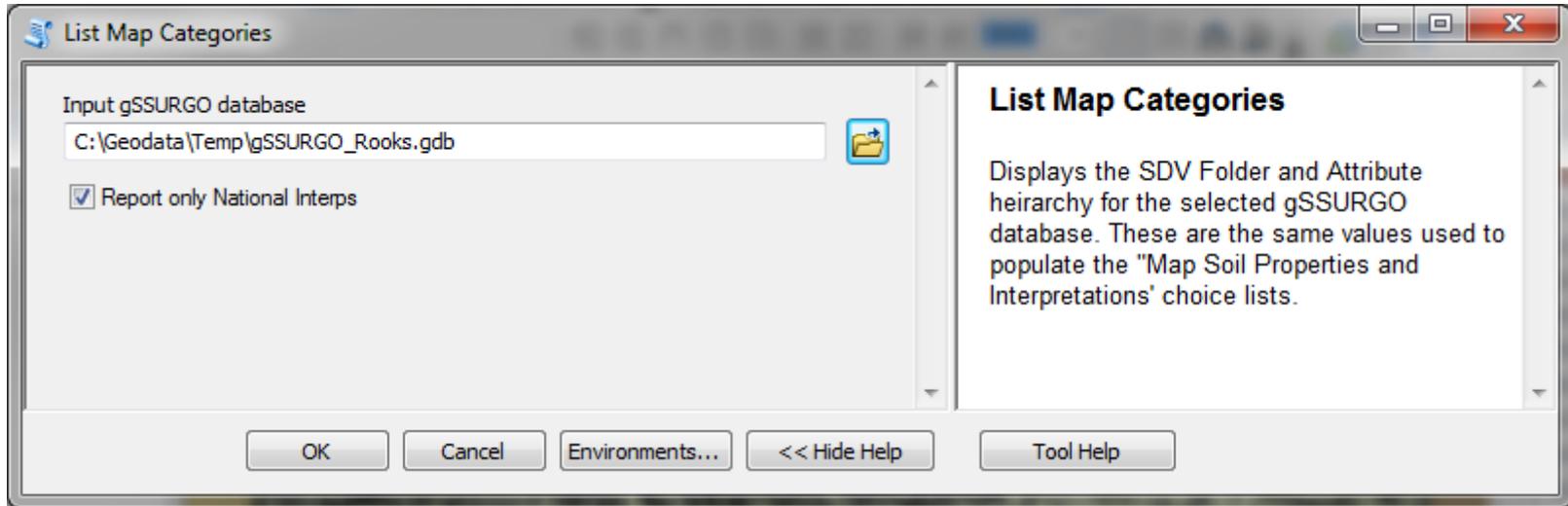
1. Join output table to soil map layer on MUKEY field.
2. Join COMPONENT table to soil map layer on COKEY field
3. Create dominant-component soil property map using data in component table.

The 'Add Join' tool located in Data Mgmt/Joins

Simple component-level 'Drainage Class' map created with the assistance of the 'Identify Dominant Components' tool. Three tables were joined to create this map (Mupolygon, Rooks_DCP*, component). The Rooks_DCP table was created by the tool.



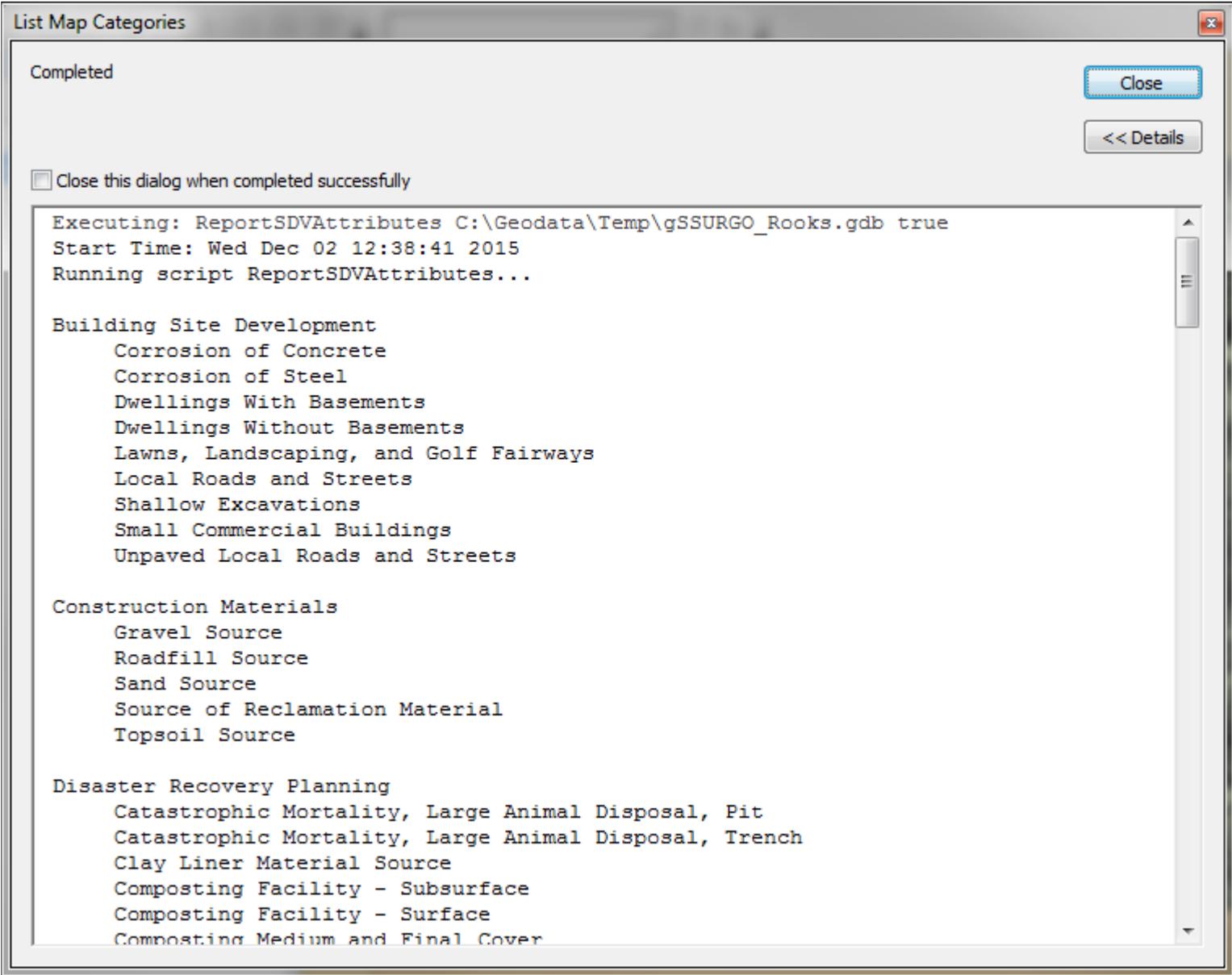
List Map Categories Tool



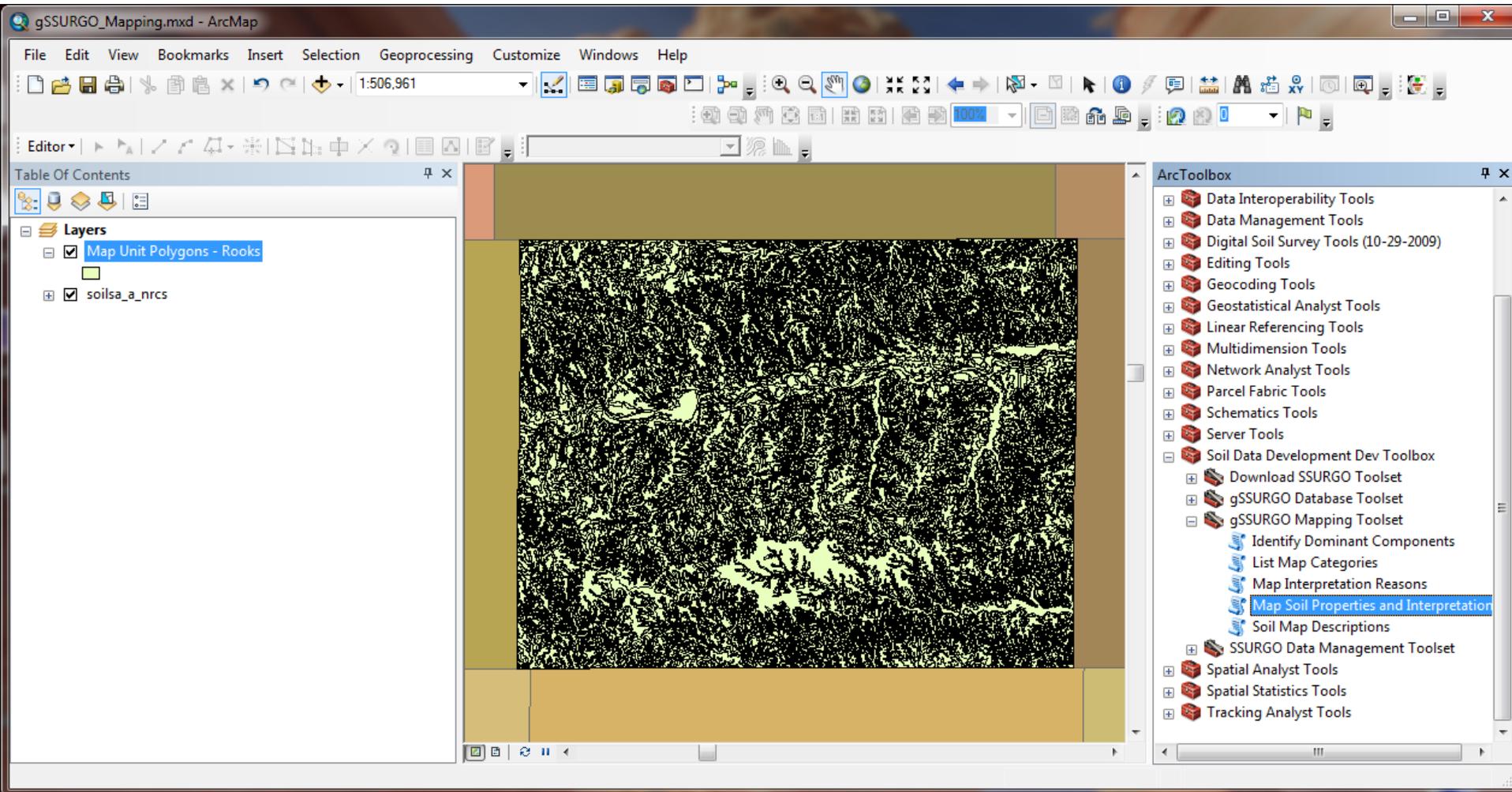
The 'List Map Categories' tool generates a tree-listing of all 'Soil Data Viewer' type maps that the 'Map Soil Properties and Interpretation' tool can produce. The information comes from the following tables in the database: sdvattribute, sdvfolderattribute, sdvfolder.

The 'Report only National Interps' option will list the national interpretations. Unchecking this option will also list any custom state interpretations in this database.

Example of 'List Map Categories' tool output to the console window. This text can be pasted to a Word document for future reference using the mouse to highlight and then Ctrl-C to copy.



Map Soil Properties and Interpretations Tool



'Map Soil Properties and Interpretations' tool creates soil maps in a similar manner as Soil Data Viewer. Parameter choice lists can vary between gSSURGO databases, especially when the user selects a soil interpretation. Some parameters may be grayed-out when their use is not appropriate for that soil property or interpretation. The following slides explain the user menu.

The current version of the 'Map Soil Properties and Interpretations' tool has 14 parameters. Many of these parameters may be enabled or disabled, depending upon choices made above. Disabled parameters will be grayed-out.

Parameters will have a default setting which normally does not be changed unless the user has a specific reason for doing so.

Map Soil Properties and Interpretations

Map unit Polygon Layer
Map Unit Polygons - FY2014

SDV Folder

SDV Attribute

Aggregation Method

Primary Constraint (optional)

Secondary Constraint (optional)

Top Depth
0 0 200

Bottom Depth
0 0 200

Beginning Month (optional)

Ending Month (optional)

Tie Break Rule (optional)

Treat Null Values as Zero

Map Interp Fuzzy Values

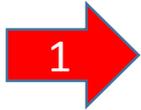
Display only National Interps

Map Soil Properties and Interpretations

Soil Data Viewer-type mapping tool for gSSURGO. The purpose is to create soil property or soil interpretation maps using gSSURGO file geodatabases.

2016-01-04

OK Cancel Environments... << Hide Help Tool Help



Map Soil Properties and Interpretations

Map unit Polygon Layer
Map Unit Polygons - FY2014

SDV Folder

SDV Attribute

Aggregation Method

Primary Constraint (optional)

Secondary Constraint (optional)

Top Depth
0 0 200

Bottom Depth
0 0 200

Beginning Month (optional)

Ending Month (optional)

Tie Break Rule (optional)

Treat Null Values as Zero

Map Interp Fuzzy Values

Display only National Interps

OK Cancel Environments... << Hide Help Tool Help

Map Soil Properties and Interpretations

Soil Data Viewer-type mapping tool for gSSURGO. The purpose is to create soil property or soil interpretation maps using gSSURGO file geodatabases.

2016-01-04

If a single soil polygon layer containing MUKEY is found in the ArcMap table of contents (TOC), that layer will be automatically selected in the first parameter.

If multiple soil polygon layers are present, the user will have to choose from the drop down menu.



The 'SDV Folder' parameter has 17 different choices. The 'Wildlife Management' choice at the bottom is not enabled.

Map Soil Properties and Interpretations

Map unit Polygon Layer
Map Unit Polygons - FY2014

SDV Folder
Soil Physical Properties

- Building Site Development
- Construction Materials
- Disaster Recovery Planning
- Land Classifications
- Land Management
- Military Operations
- Recreational Development
- Sanitary Facilities
- Soil Chemical Properties
- Soil Erosion Factors
- Soil Physical Properties
- Soil Qualities and Features
- Vegetative Productivity
- Waste Management
- Water Features
- Water Management
- Wildlife Management

Bottom Depth
0 0 200

Beginning Month (optional)

Ending Month (optional)

Tie Break Rule (optional)

Treat Null Values as Zero

Map Interp Fuzzy Values

Display only National Interps

OK Cancel Environments... << Hide Help Tool Help

SDV Folder

Top level category of soil properties or interpretations.

Examples:

- Building Site Development
- Land Management
- Soil Physical Properties

These choices are obtained from the gSSURGO database. They are not hard coded.



Map Soil Properties and Interpretations

Click error and warning icons for more information

Map unit Polygon Layer
Map Unit Polygons - FY2014

SDV Folder
Soil Physical Properties

SDV Attribute
Percent Sand

- Available Water Capacity
- Available Water Storage
- Available Water Supply, 0 to 100 cm
- Available Water Supply, 0 to 150 cm
- Available Water Supply, 0 to 25 cm
- Available Water Supply, 0 to 50 cm
- Bulk Density, 15 Bar
- Bulk Density, One-Tenth Bar
- Bulk Density, One-Third Bar
- Linear Extensibility
- Liquid Limit
- Organic Matter
- Percent Clay
- Percent Sand
- Percent Silt
- Plasticity Index
- Saturated Hydraulic Conductivity (Ksat)
- Saturated Hydraulic Conductivity (Ksat), Standard Classes
- Surface Texture
- Water Content, 15 Bar
- Water Content, One-Third Bar

Ending Month (optional)

Tie Break Rule (optional)
Higher

Treat Null Values as Zero

Map Interp Fuzzy Values

Display only National Interps

OK Cancel Environments... << Hide Help Tool Help

SDV Attribute

Specific soil property or interpretations to be mapped. Examples include "Corrosion of Concrete", "Available Water Capacity", "

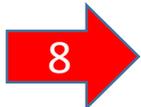
These choices are obtained from the gSSURGO database at runtime.

The 'SDV Attribute' parameter is dependent on the previous selection made for 'SDV Folder'.

In all, there are over 160 possible selections for soil properties or interpretations, not including custom state versions.



As soon as the user chooses a horizon-level 'SDV Attribute' such as 'Percent Sand', the two parameters for horizon depth are automatically enabled.



A red 'X' is immediately displayed, letting the user know that they must set the top and bottom depths before the tool can be executed.

The screenshot shows a software dialog box titled "Map Soil Properties and Interpretations". The main area contains several dropdown menus and input fields: "Map unit Polygon Layer" (Map Unit Polygons - FY2014), "SDV Folder" (Soil Physical Properties), "SDV Attribute" (Percent Sand), "Aggregation Method" (Dominant Component), "Primary Constraint (optional)", "Secondary Constraint (optional)", "Top Depth" (slider from 0 to 200), "Bottom Depth" (slider from 0 to 200, marked with a red 'X' error icon), "Beginning Month (optional)", "Ending Month (optional)", "Tie Break Rule (optional)" (Higher), and three checkboxes: "Treat Null Values as Zero", "Map Interp Fuzzy Values", and "Display only National Interps". At the bottom are buttons for "OK", "Cancel", "Environments...", "<< Hide Help", and "Tool Help".

The right-hand panel is titled "Bottom Depth" and contains the following text:
Bottom Depth
Bottom depth (cm) for horizon calculations. Value must be set to 1 (one) or greater.

A red error flag will be displayed until the bottom depth is set properly.

Top depth setting always defaults to the surface (0 centimeter). To only report properties for the surface horizon, set the top depth to 0 and bottom depth to 1 cm.



Map Soil Properties and Interpretations

Map unit Polygon Layer
Map Unit Polygons - FY2014

SDV Folder
Soil Physical Properties

SDV Attribute
Percent Sand

Aggregation Method
Dominant Component

Primary Constraint (optional)

Secondary Constraint (optional)

Top Depth
0 0 200

Bottom Depth
25 0 200

Beginning Month (optional)

Ending Month (optional)

Tie Break Rule (optional)
Higher

Treat Null Values as Zero

Map Interp Fuzzy Values

Display only National Interps

Map Soil Properties and Interpretations

Soil Data Viewer-type mapping tool for gSSURGO. The purpose is to create soil property or soil interpretation maps using gSSURGO file geodatabases.

2016-01-04

OK Cancel Environments... << Hide Help Tool Help

Map Soil Properties and Interpretations

Map unit Polygon Layer
Map Unit Polygons - FY2014

SDV Folder
Soil Physical Properties

SDV Attribute
Percent Sand

Aggregation Method
Dominant Component

Primary Constraint (optional)

Secondary Constraint (optional)

Top Depth
45

Bottom Depth
0

Beginning Month (optional)

Ending Month (optional)

Tie Break Rule (optional)
Higher

Treat Null Values as Zero

Map Interp Fuzzy Values

Display only National Interps

ERROR -1
Top Depth cannot be greater than Bottom Depth

Map Soil Properties and Interpretations

Soil Data Viewer-type mapping tool for gSSURGO. The purpose is to create soil property or soil interpretation maps using gSSURGO file geodatabases.

2016-01-04

OK Cancel Environments... << Hide Help Tool Help

Inappropriate settings for top or bottom depth will result in an error. In this example, the top depth is set lower than the bottom depth.



Map Soil Properties and Interpretations

Map unit Polygon Layer
Map Unit Polygons - FY2014

SDV Folder
Soil Physical Properties

SDV Attribute
Percent Sand

Aggregation Method
Dominant Component

Primary Constraint (optional)

Secondary Constraint (optional)

Top Depth
0 0 200

Bottom Depth
25 0 200

Beginning Month (optional)

Ending Month (optional)

Tie Break Rule (optional)
Higher

Treat Null Values as Zero

Map Interp Fuzzy Values

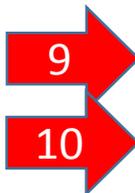
Display only National Interps

OK Cancel Environments... << Hide Help Tool Help

Display only National Interps

Populate the 'SDV_Attribute' choice list using only National Interpretation. Checking this option will exclude custom state interpretations.

For 'Percent Sand', the 'Beginning Month' and 'Ending Month' parameters have no application and are disabled.



Map Soil Properties and Interpretations

Map unit Polygon Layer
Map Unit Polygons - FY2014

SDV Folder
Soil Physical Properties

SDV Attribute
Percent Sand

Aggregation Method
Dominant Component

Primary Constraint (optional)

Secondary Constraint (optional)

Top Depth
0 0 200

Bottom Depth
25 0 200

Beginning Month (optional)

Ending Month (optional)

Tie Break Rule (optional)
Higher

Treat Null Values as Zero

Map Interp Fuzzy Values

Display only National Interps

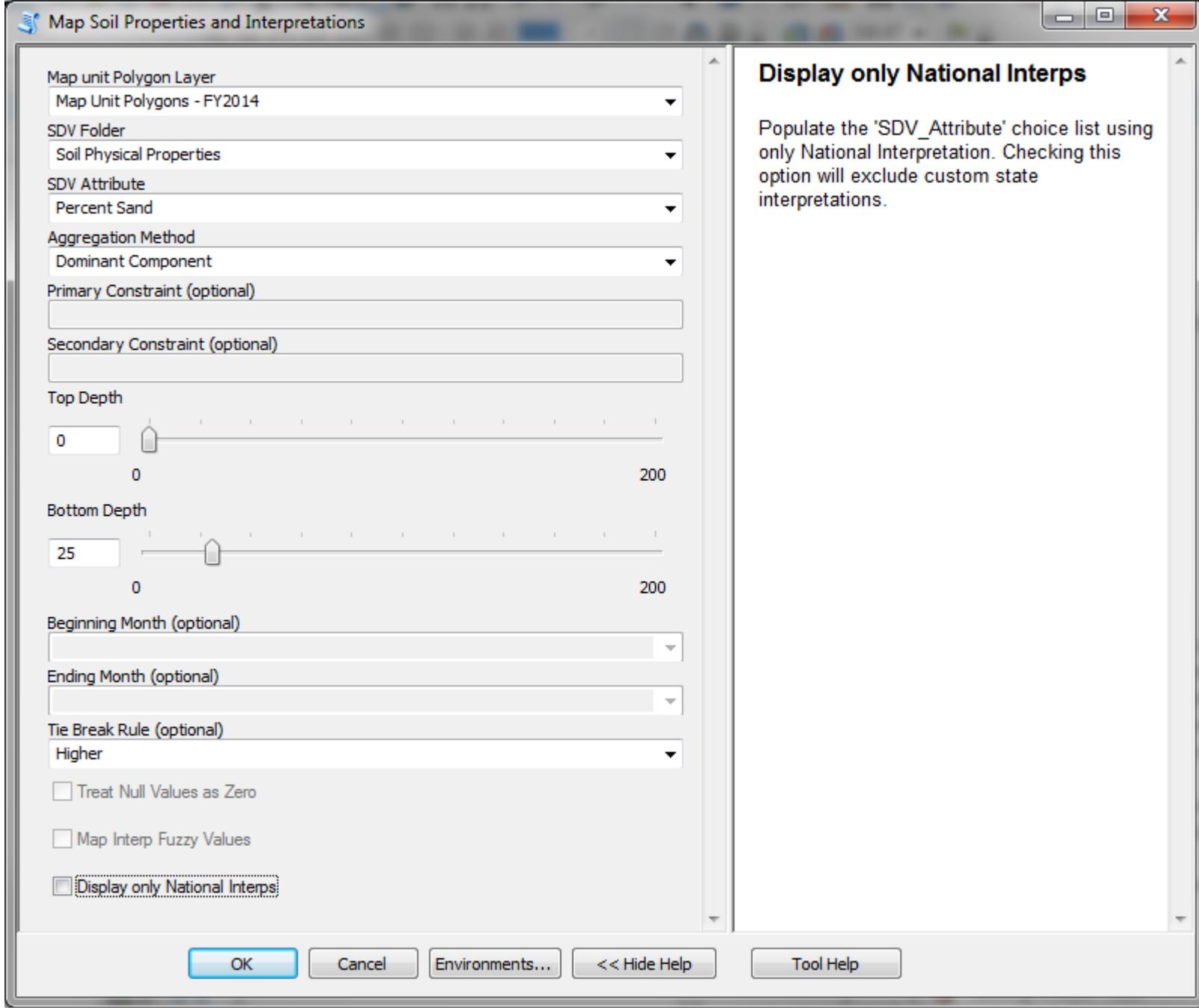
OK Cancel Environments... << Hide Help Tool Help

The Tie Break Rule controls which rating or property value is reported in case of a tie in component percent.

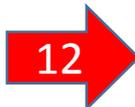


Display only National Interps

Populate the 'SDV_Attribute' choice list using only National Interpretation. Checking this option will exclude custom state interpretations.



The Treat Nulls as Zero parameter controls how null values in certain soil properties are handled. When checked, null values will be converted to zeros in the aggregation calculation.



The Map Interp Fuzzy Values will create a soil map based upon fuzzy values rather than the rating class.



Map Soil Properties and Interpretations

Map unit Polygon Layer
Map Unit Polygons - FY2014

SDV Folder
Soil Physical Properties

SDV Attribute
Percent Sand

Aggregation Method
Dominant Component

Primary Constraint (optional)

Secondary Constraint (optional)

Top Depth
0 0 200

Bottom Depth
25 0 200

Beginning Month (optional)

Ending Month (optional)

Tie Break Rule (optional)
Higher

Treat Null Values as Zero

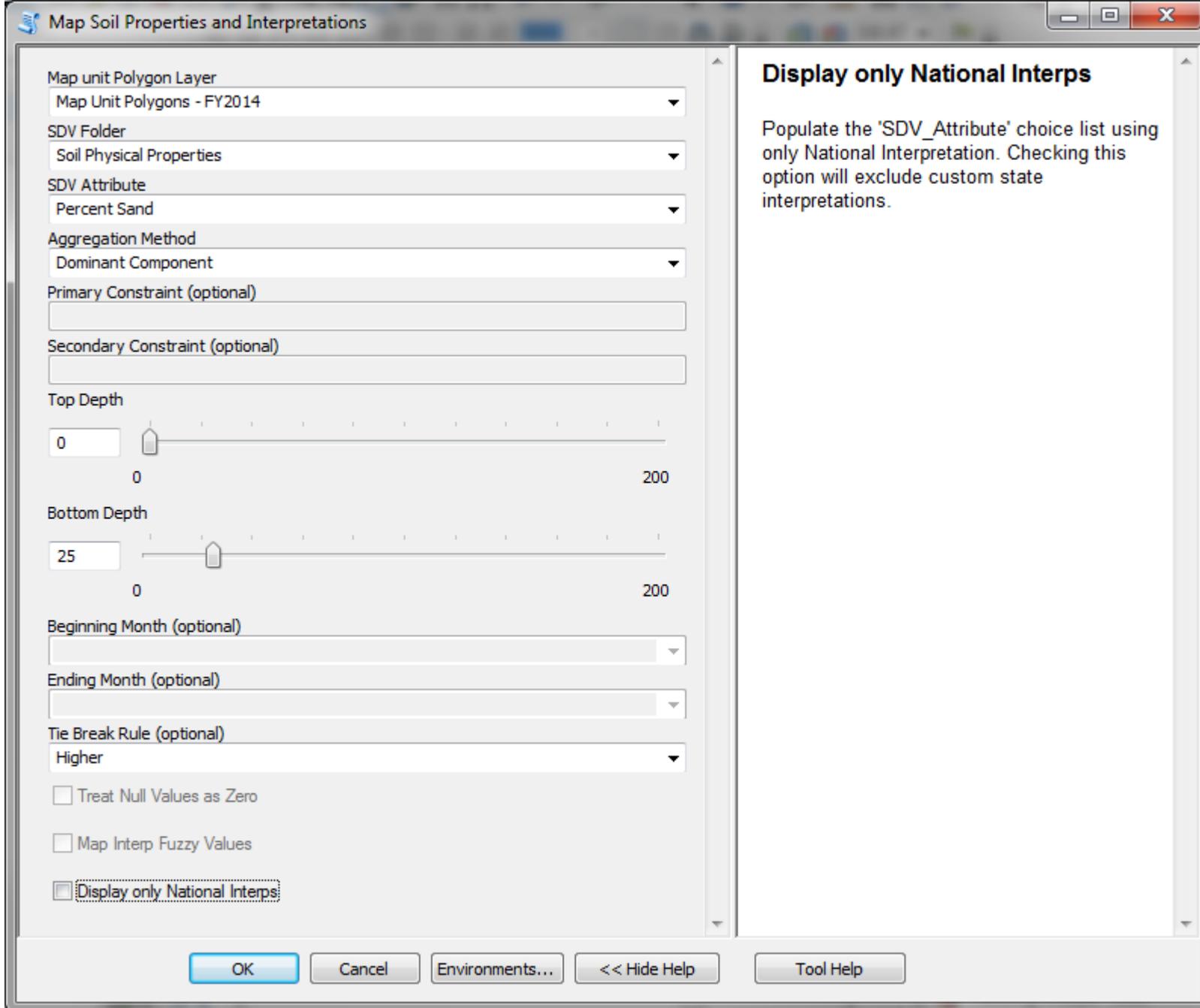
Map Interp Fuzzy Values

Display only National Interps

Display only National Interps

Populate the 'SDV_Attribute' choice list using only National Interpretation. Checking this option will exclude custom state interpretations.

OK Cancel Environments... << Hide Help Tool Help

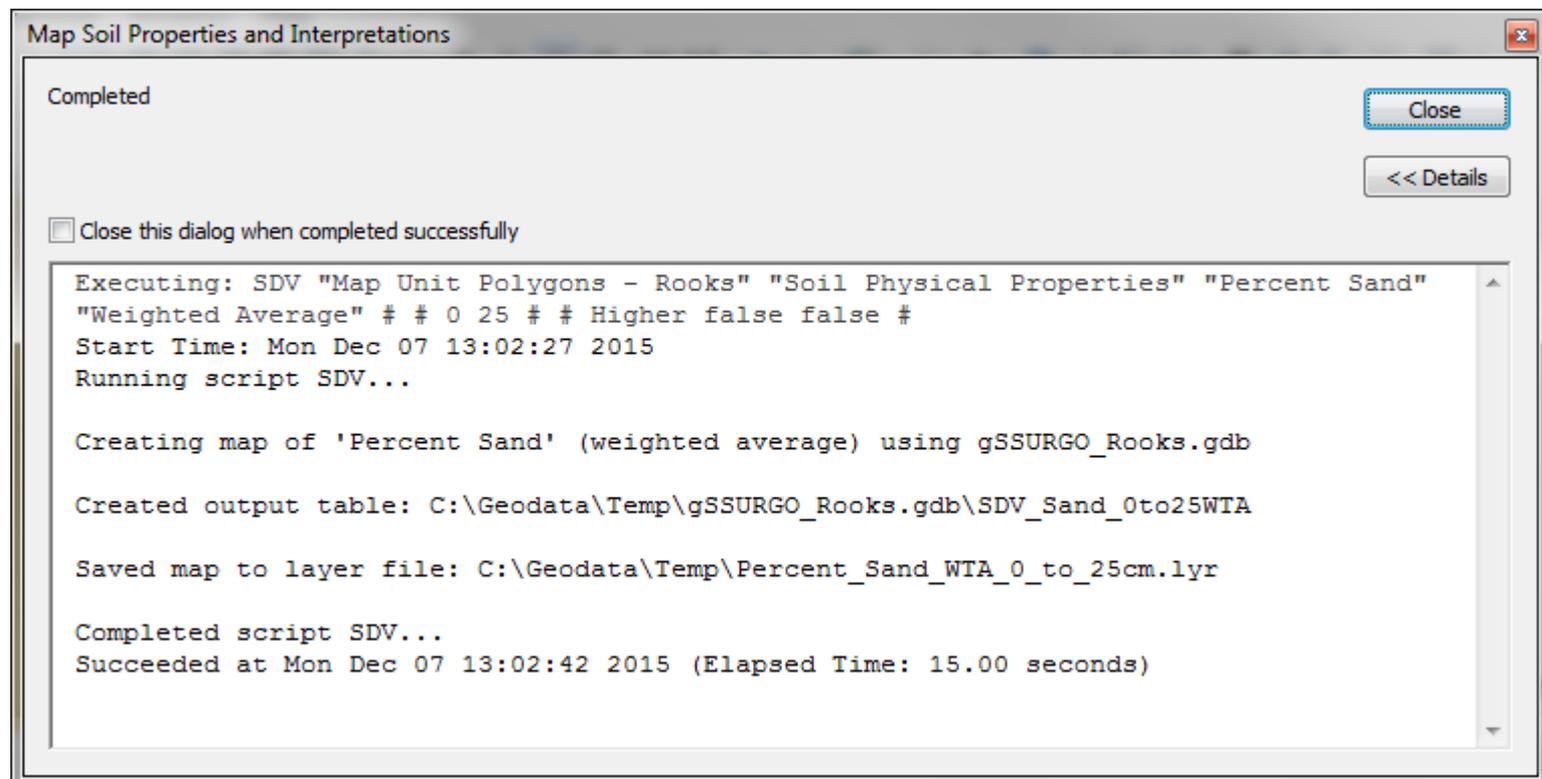


The Display only National Interps option can be used to limit the SDV Attribute choice list to only National Interpretations by excluding custom-State interpretations.

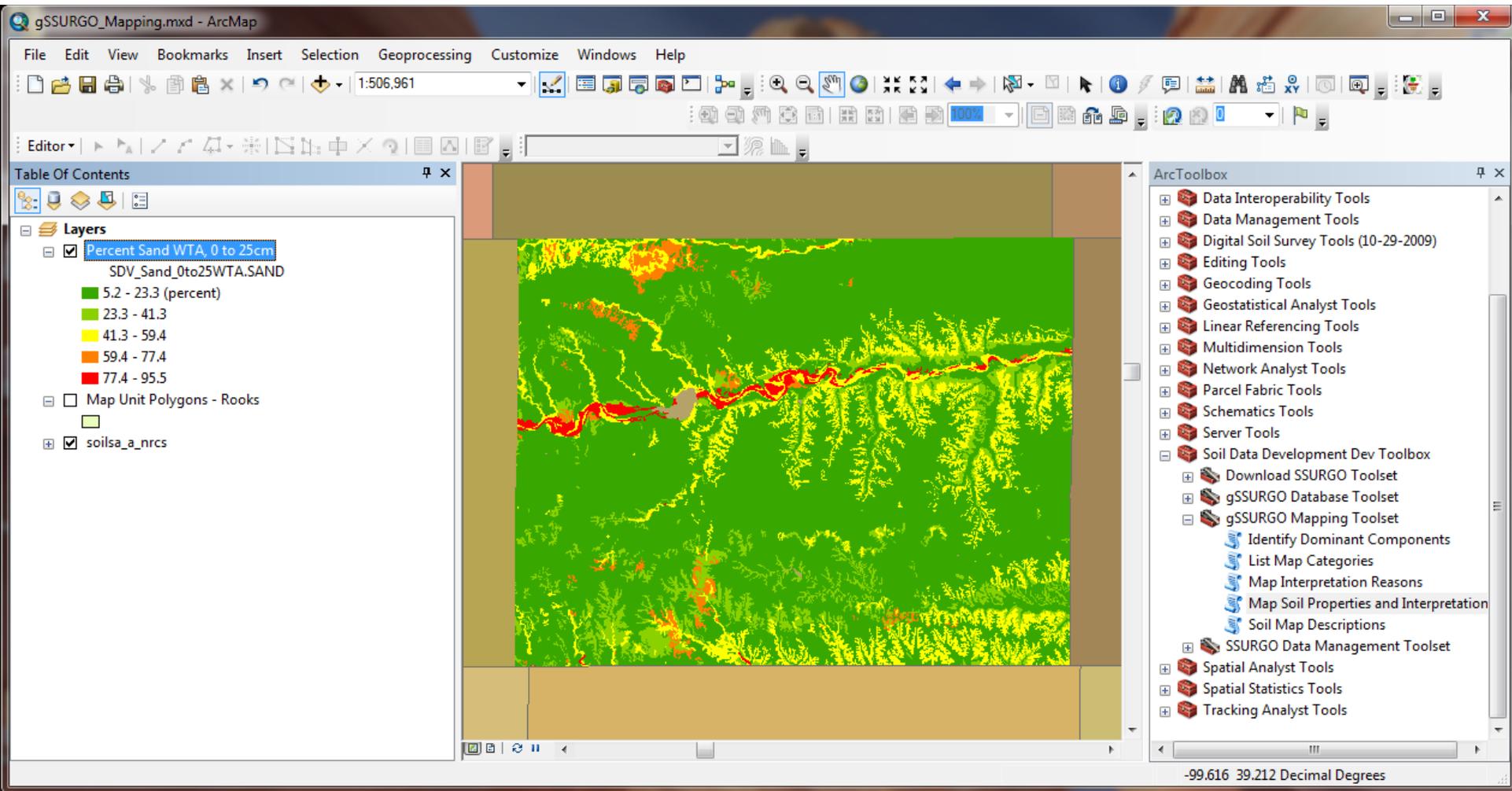


Below is an example of the console messages from the 'Map Soil Properties and Interpretations' tool for 'Percent Sand'. These messages include important information such as:

1. Input database
2. Output rating table which can be joined to the MapunitRaster layer
3. Layer file (.lyr) that can be used in other ArcMap projects while preserving joins and symbology.



Map created by the 'Map Soil Properties and Interpretations' tool for 'Percent Sand'



Layer Descriptions

The 'Map Soil Properties and Interpretations' tool automatically creates a layer description for each soil map layer (Layer Properties/General Tab). Below is an example of the description for 'Percent Sand WTA'. This information is also stored in the layer file (.lyr) for each map.

Sand as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In the database, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter. The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Units of Measure: percent

Aggregation Method: Weighted Average; Tiebreak rule: Higher

Top horizon depth: 0; Bottom horizon depth: 25

GeoDatabase: C:\Geodata\Temp\gSSURGO_Rooks.gdb

Featureclass: MUPOLYGON

Rating Table: SDV_Sand_0to25WTA

Layer File: C:\Geodata\Temp\Percent_Sand_WTA_0_to_25cm.lyr

Created by steve.peaslee on 2015-12-07

Layer Files (.lyr)

The 'Map Soil Properties and Interpretations' tool automatically creates a layer file for each map layer and displays the name and location of this file in the console messages. The layer description information also includes the name and location of the layer file.

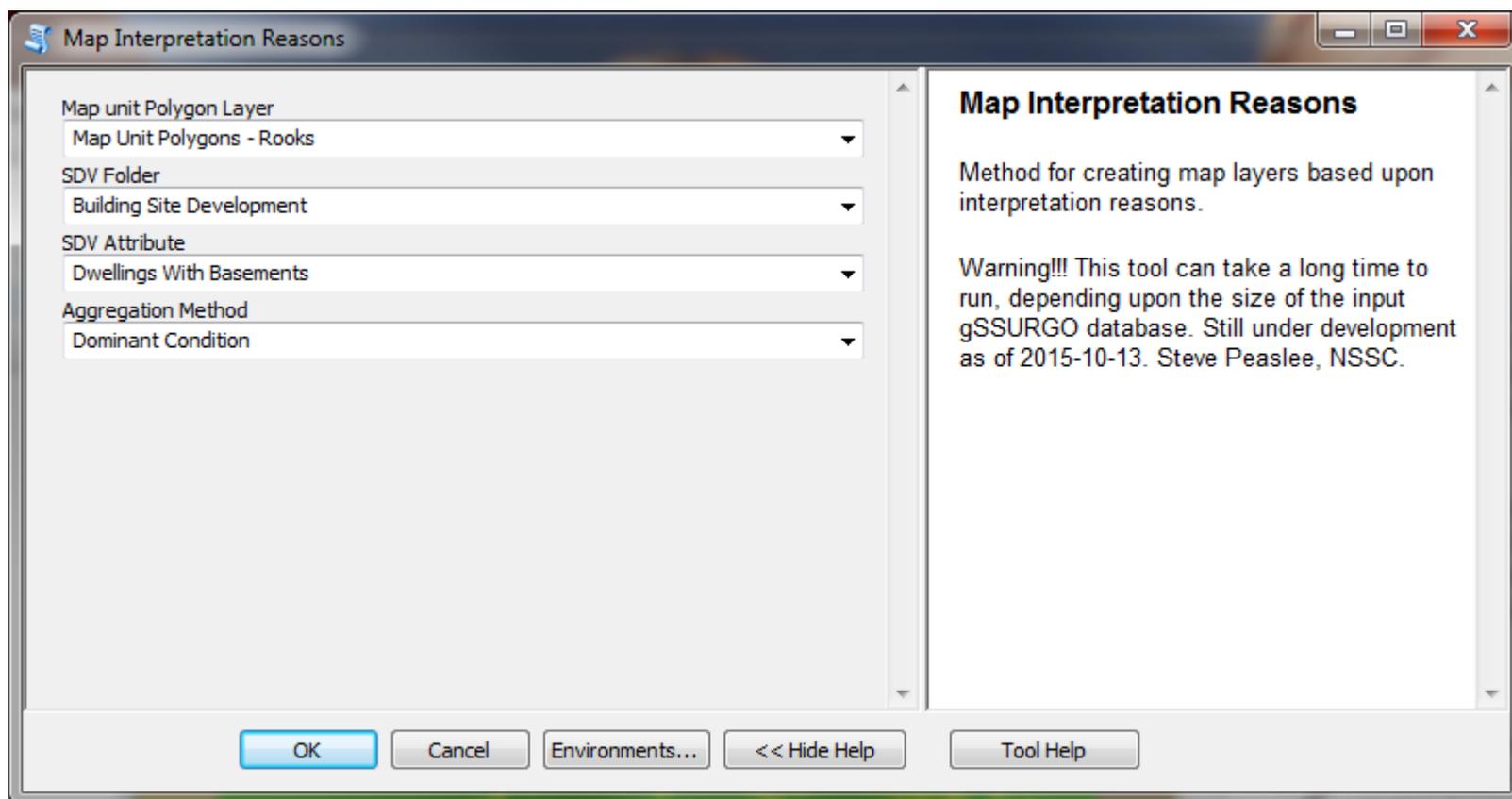
The tool creates layer symbology and temporarily joins the rating table to the soil polygon featureclass (MUPOLYGON). These settings are saved to the layer file and then the layer is added to the ArcMap table of contents (TOC). *Adding the MUPOLYGON featureclass to future ArcMap sessions will not automatically recreate the map legend.* This can only be accomplished by adding the layer file (.lyr) to ArcMap. The layer files are stored in the same folder as the geodatabase. An example might be something like: *C:\Geodata\Temp\Percent_Sand_WTA_0_to_25cm.lyr*. If the gSSURGO databases are moved or copied to a new location, always keep the layer files and databases together and do not change the names of the gSSURGO databases. Failure to follow these instructions will break the layer files.

Since the layer file names are not necessarily unique, it is a good idea to keep each gSSURGO database in its own, separate folder. Storing multiple gSSURGO databases in the same folder can result in layer files being accidentally overwritten.

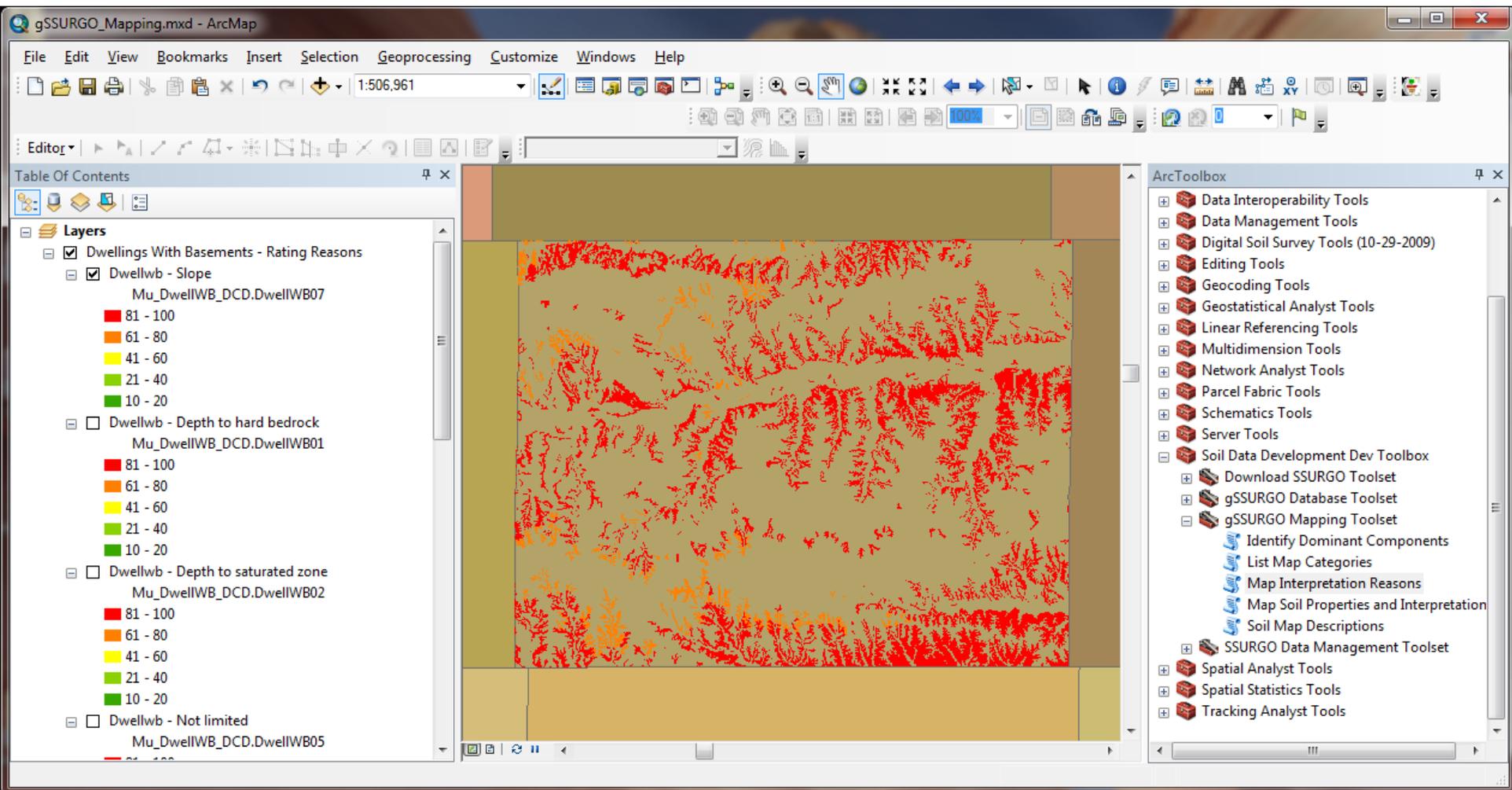
The output rating table names always begin with 'SDV_' and are created within the gSSURGO database. **These same rating tables can be joined to the MapunitRaster layer using the 'MUKEY' column.** Symbology will have to be manually created, but for large databases, drawing performance is greatly improved by using the raster.

Map Interpretation Reasons Tool

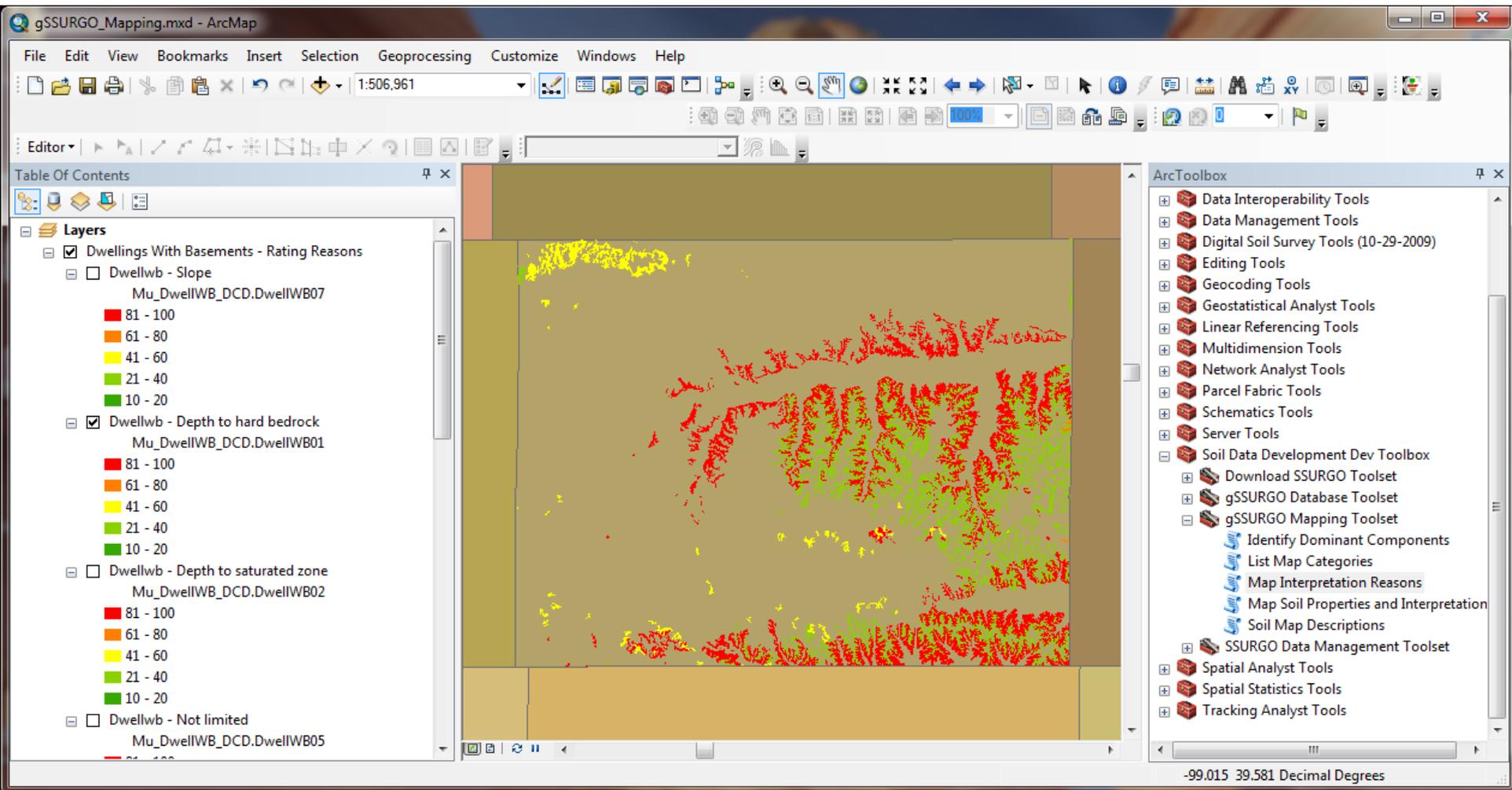
The 'Map Interpretation Reasons' tool is designed to map the extent and component percent of each of the limiting factors that go into the selected soil interpretation. Some interpretations can involve many factors and will thus generate a lot of map layers. Each layer is added to the ArcMap table of contents under a group layer named after the selected interpretation. This tool can take a long time to run, depending on the size of the database and the number of layers generated.



The 'Map Interpretation Reasons' tool will create a separate group layer for each of the limitations. The example below shows areas where 'Slope' is a limitation for 'Dwellings With Basements'. Other layers can be turned on-or-off in the ArcMap table of contents. Symbology is based upon component percent for that limitation.



The example below shows areas where 'Depth to hard bedrock' is a limitation for 'Dwellings With Basements'.



The example below highlights the map units that are rated as being without limitation for 'Dwellings With Basements'.

