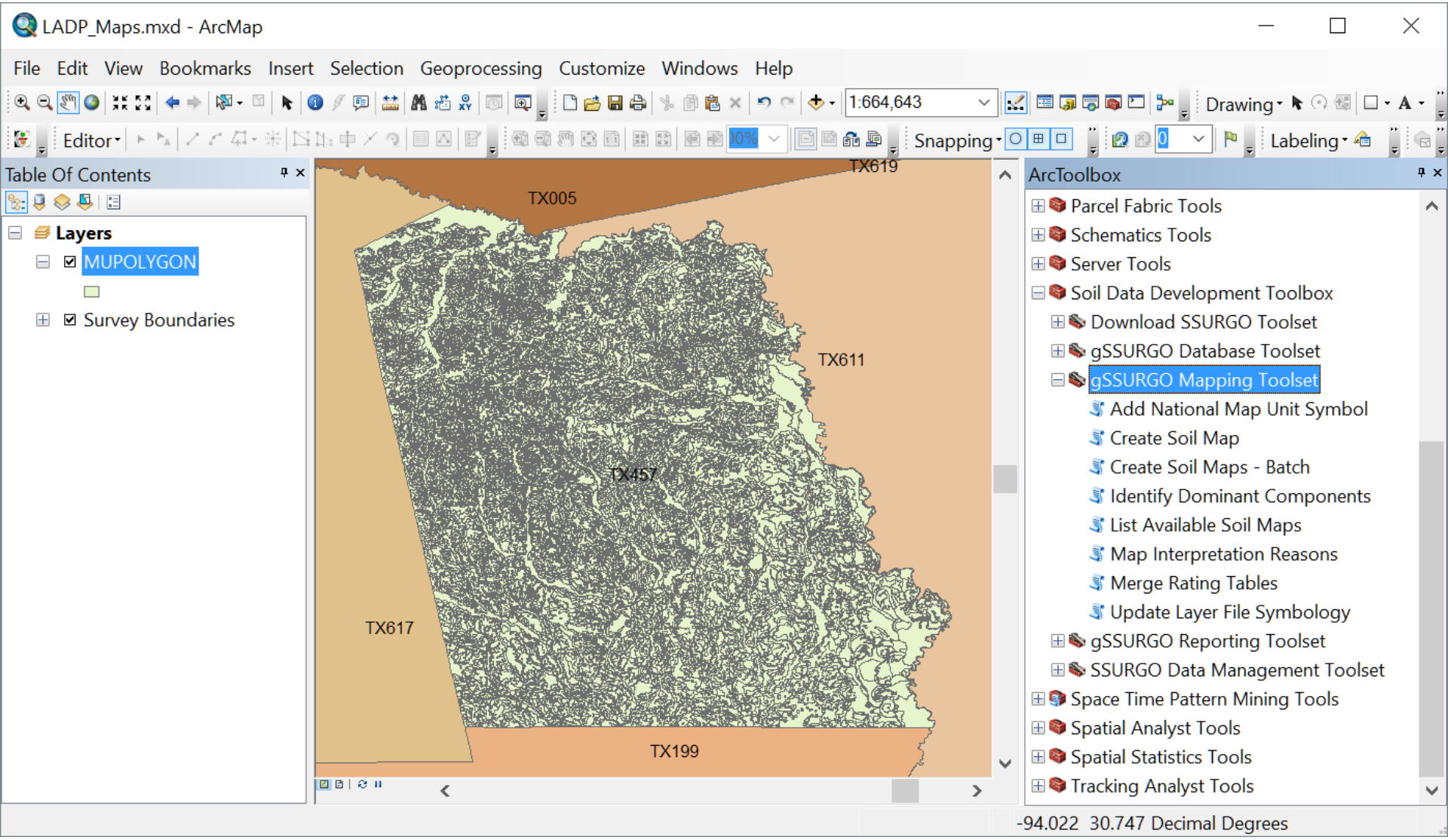
gSSURGO Mapping Toolset

(a member of the Soil Data Development Toolbox)

Individual Tools:

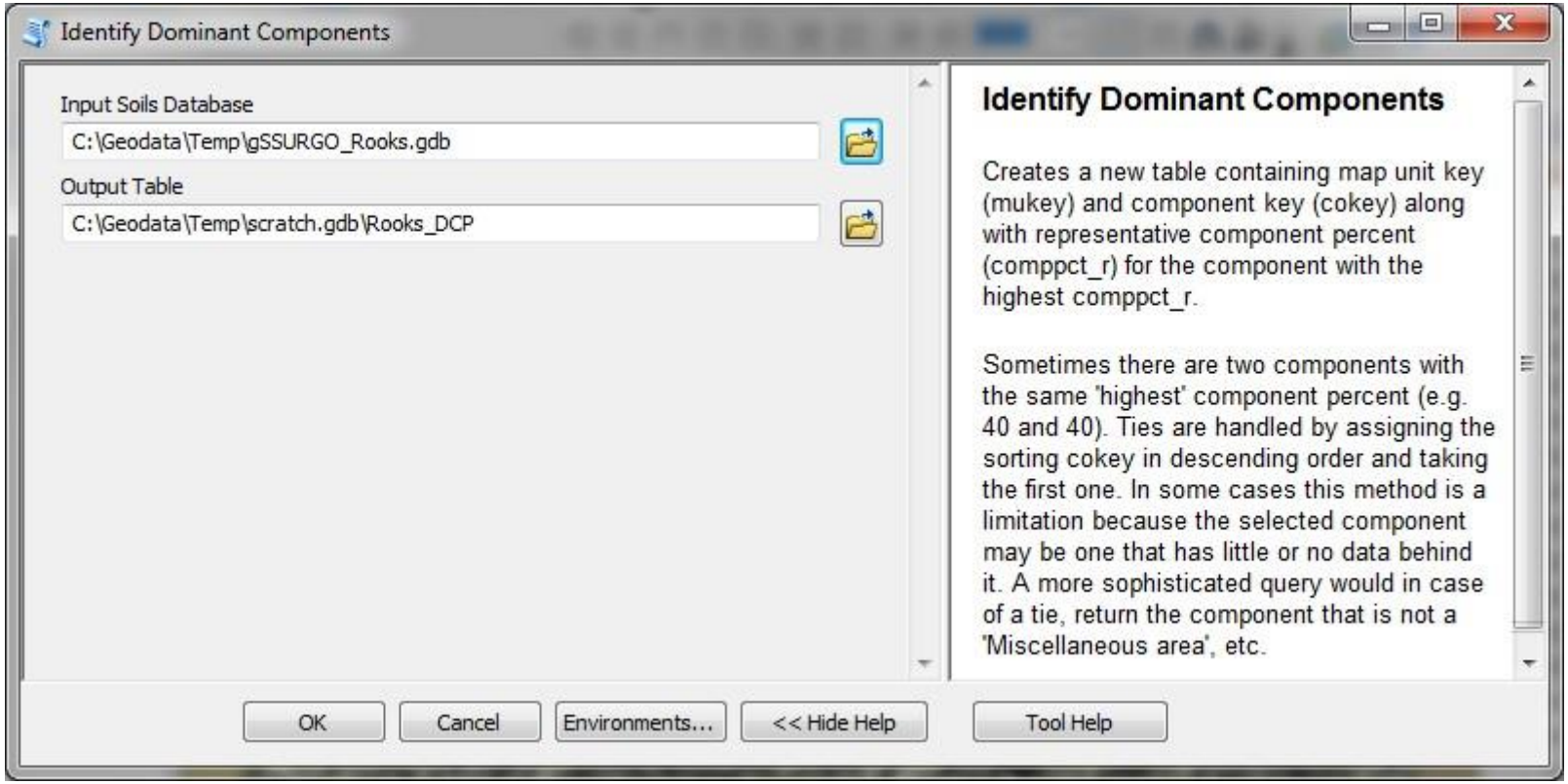
Add National Map Unit Symbol
Create Soil Map
Create Soil Maps - Batch
Identify Dominant Components
List Available Soil Maps
Map Interpretation Reasons
Merge Rating Tables
Update Layer File Symbology

The ‘gSSURGO Mapping’ toolset is a part of the ‘Soil Data Development’ toolbox for gSSURGO. This toolbox is compatible with ArcGIS Desktop versions 10.3 – 10.5.



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 comppct_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

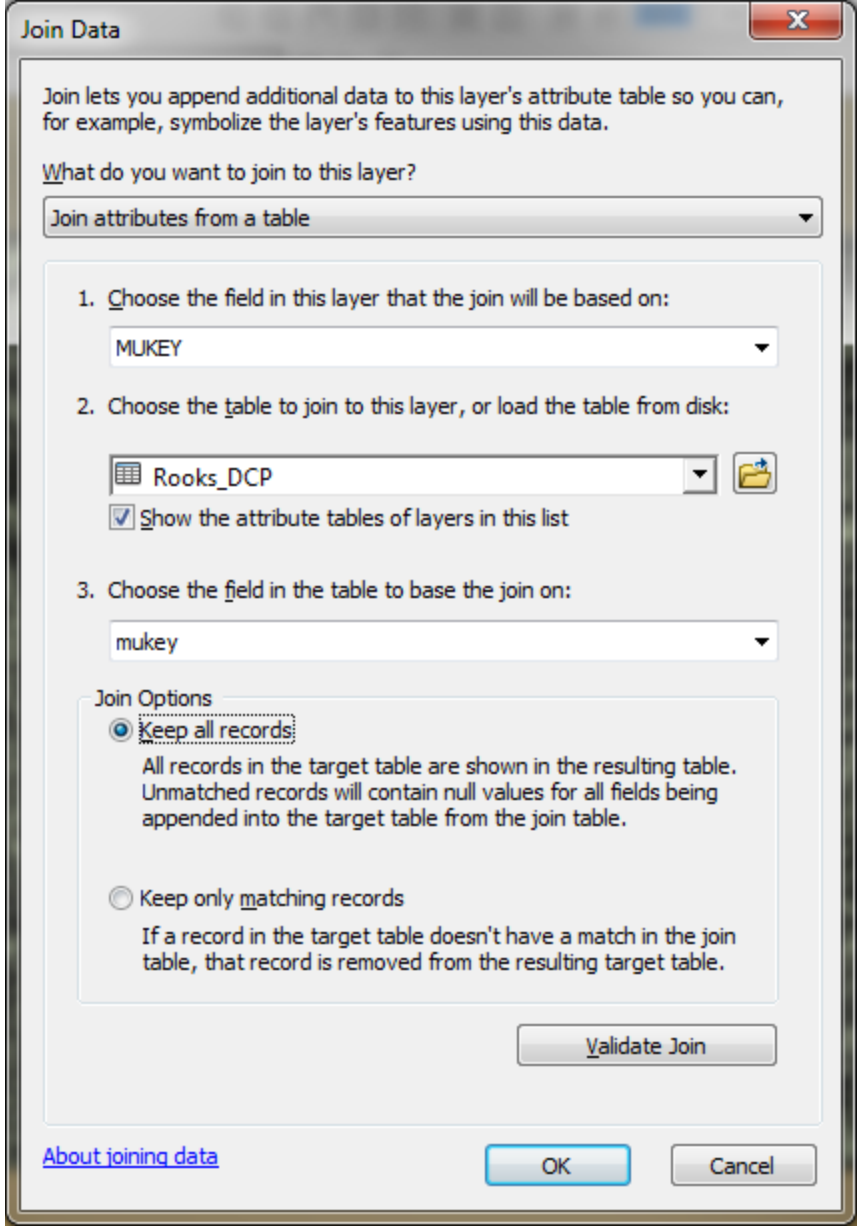
OBJECTID *	mukey *	cokey	comppct_r
1	2876217	11805065	80
2	1150273	11804906	50
3	1150242	11805154	45
4	1150271	11805026	95
5	1150270	11805051	87
6	1150277	11805110	45
7	1150276	11805082	90
8	1150275	11805076	90
9	1150243	11805150	55
10	1150255	11804949	100
11	1150279	11804952	100
12	1150278	11804950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

1 (0 out of 68 Selected)

Rooks_DCP

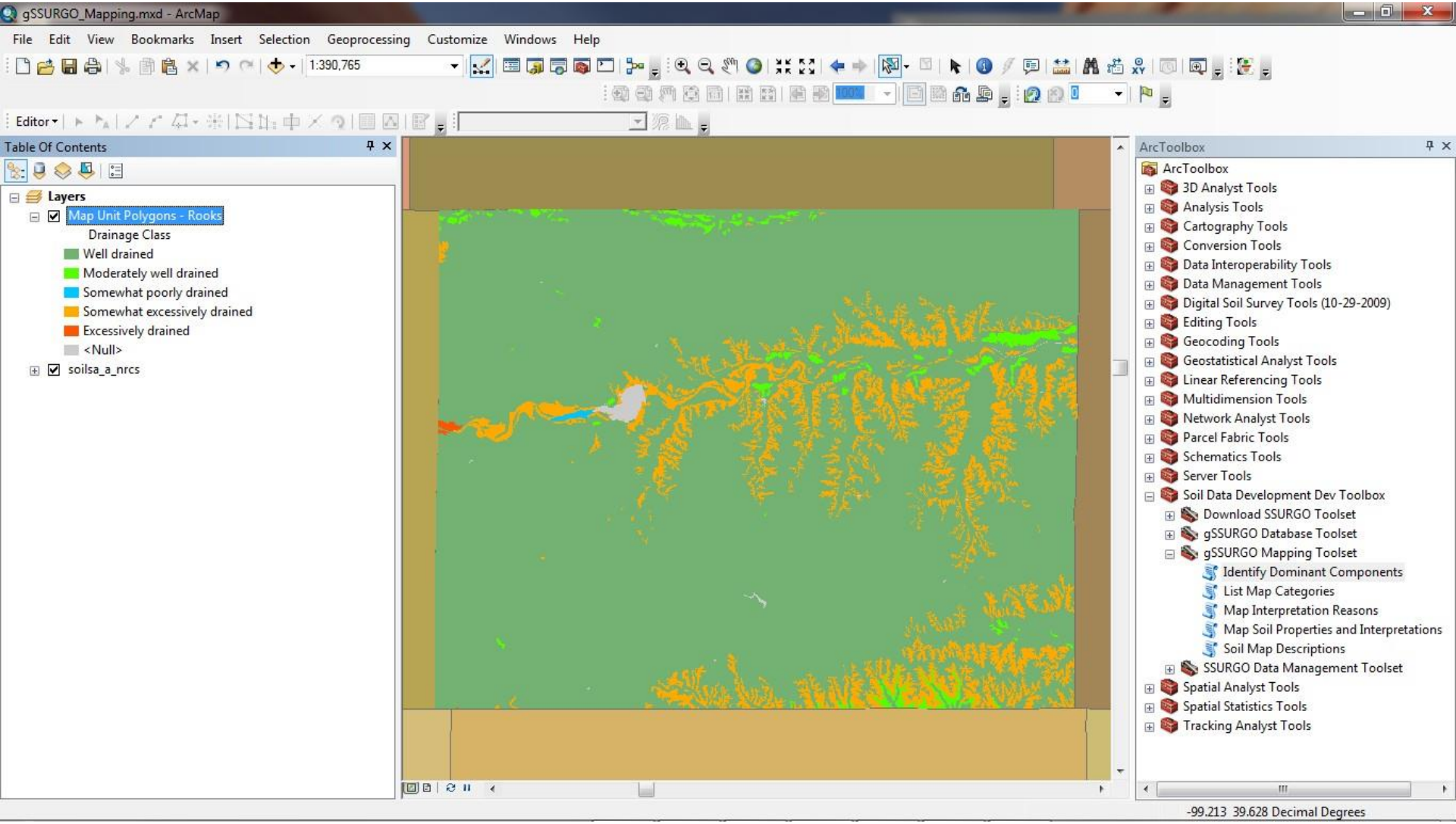
Output table containing the cokey associated with each map unit's dominant component.

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

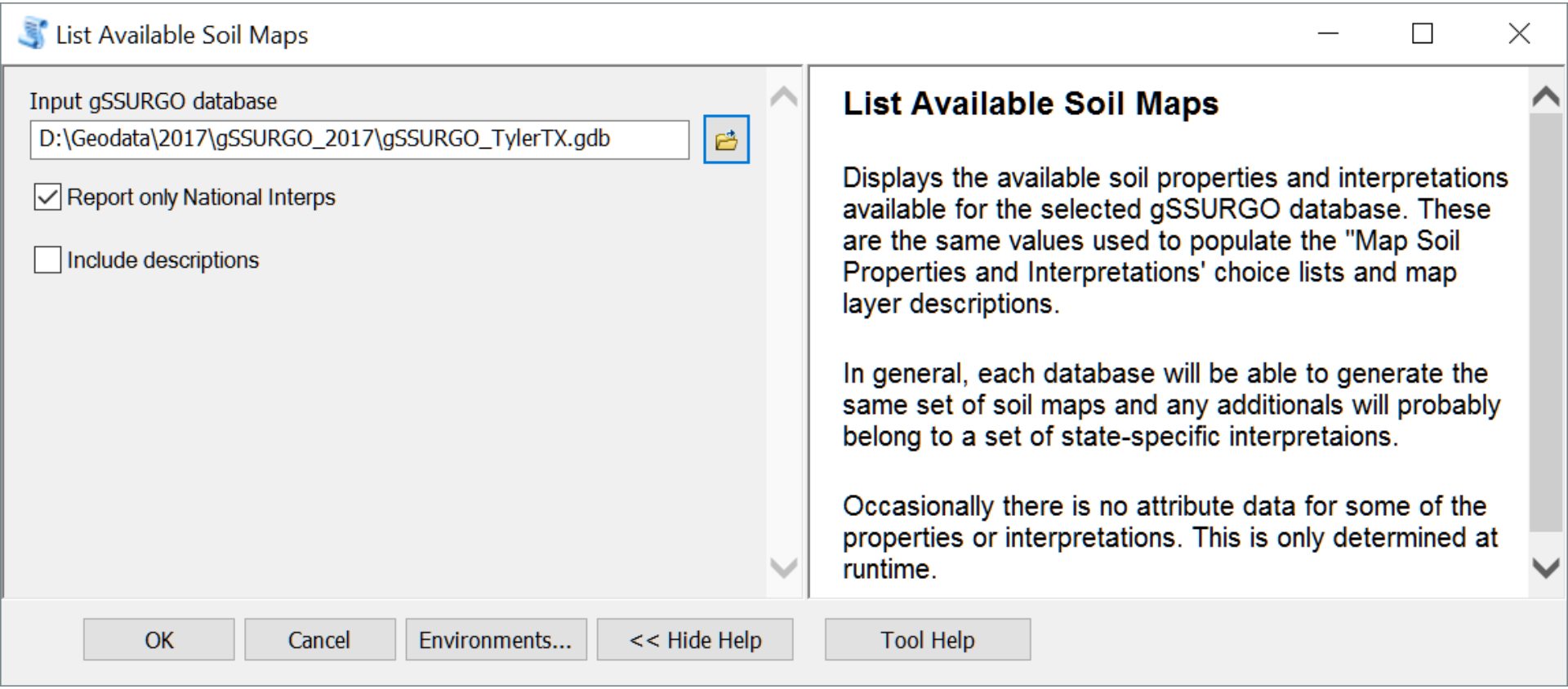


The 'Add Join' tool located in Data Mgmt/Joins

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.

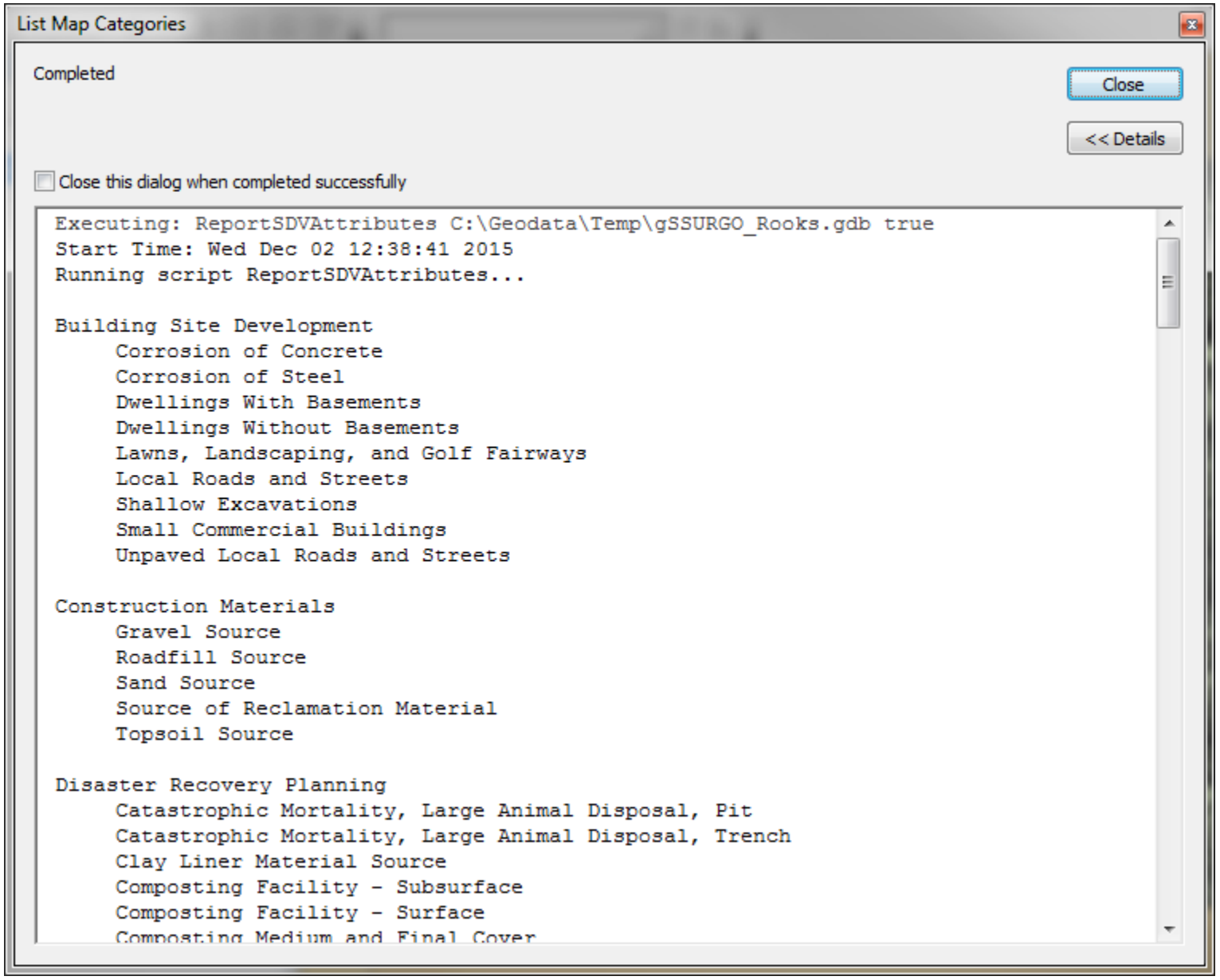


List Available Soil Maps Tool

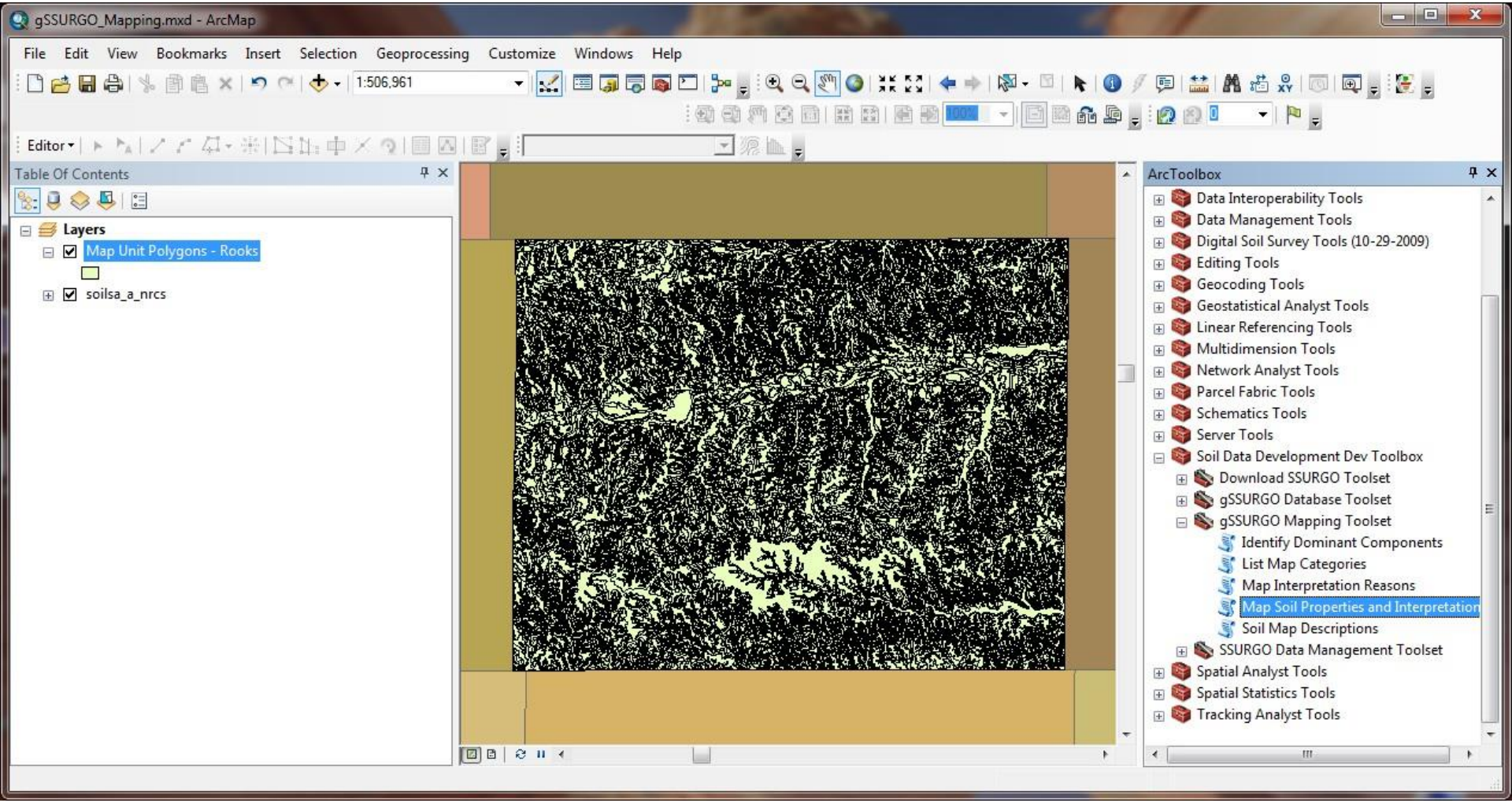


The 'List Map Categories' tool generates a tree-listing of all 'Soil Data Viewer' type maps that the 'Create Soil Maps' tool can produce with this database.
The default 'Report only National Interps' option will list only the national interpretations. Unchecking this option will add any custom state interpretations present in the selected database.
Including descriptions will add the narrative information for each property or interpretation.

Example of 'List Available Soil Maps' 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.



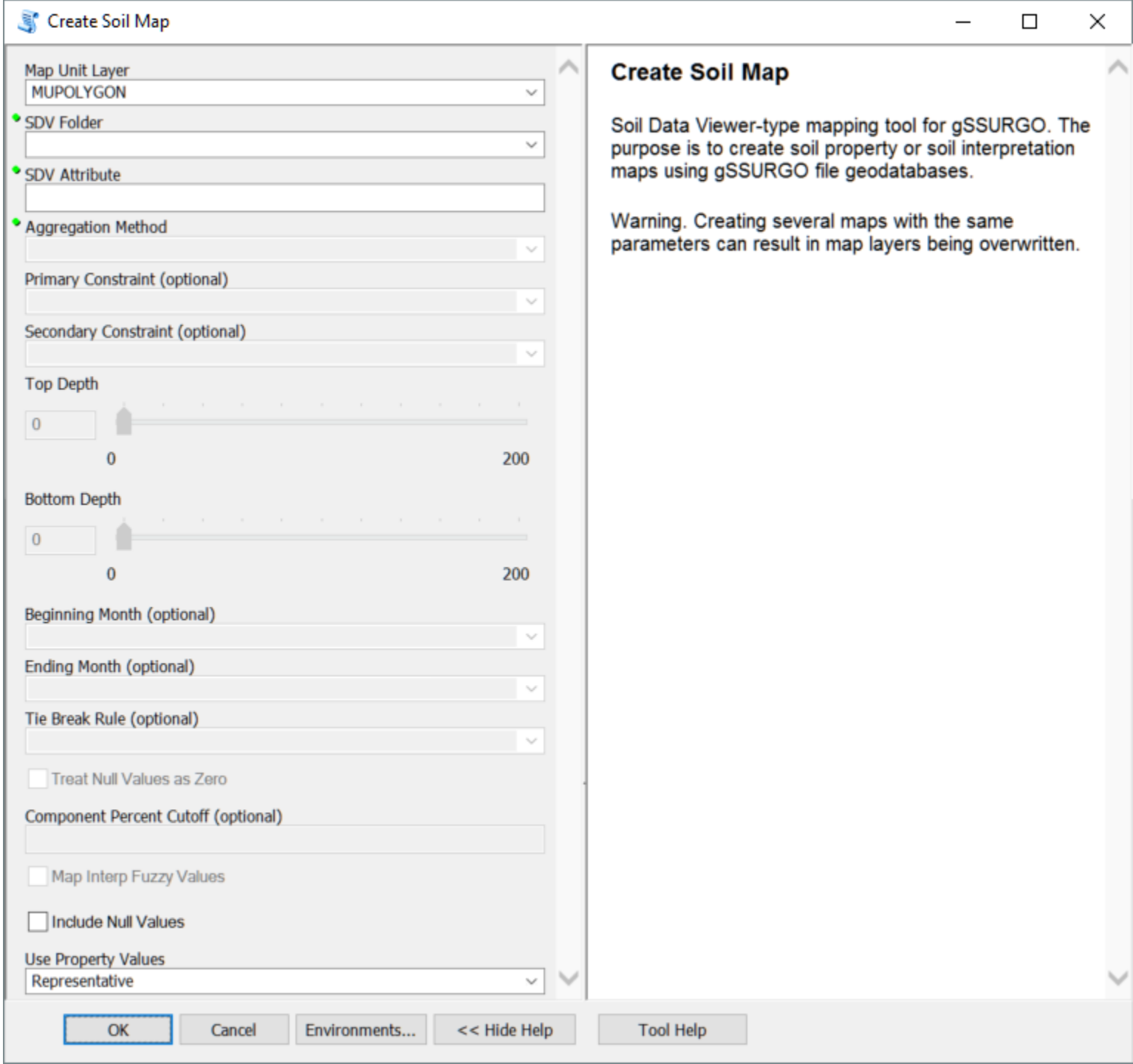
Create Soil Map Tool



'Create Soil Map' 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 ‘Create Soil Map’ tool has 16 parameters. Many of these parameters may be enabled or disabled, depending upon choices made above. Disabled parameters will be grayed-out.

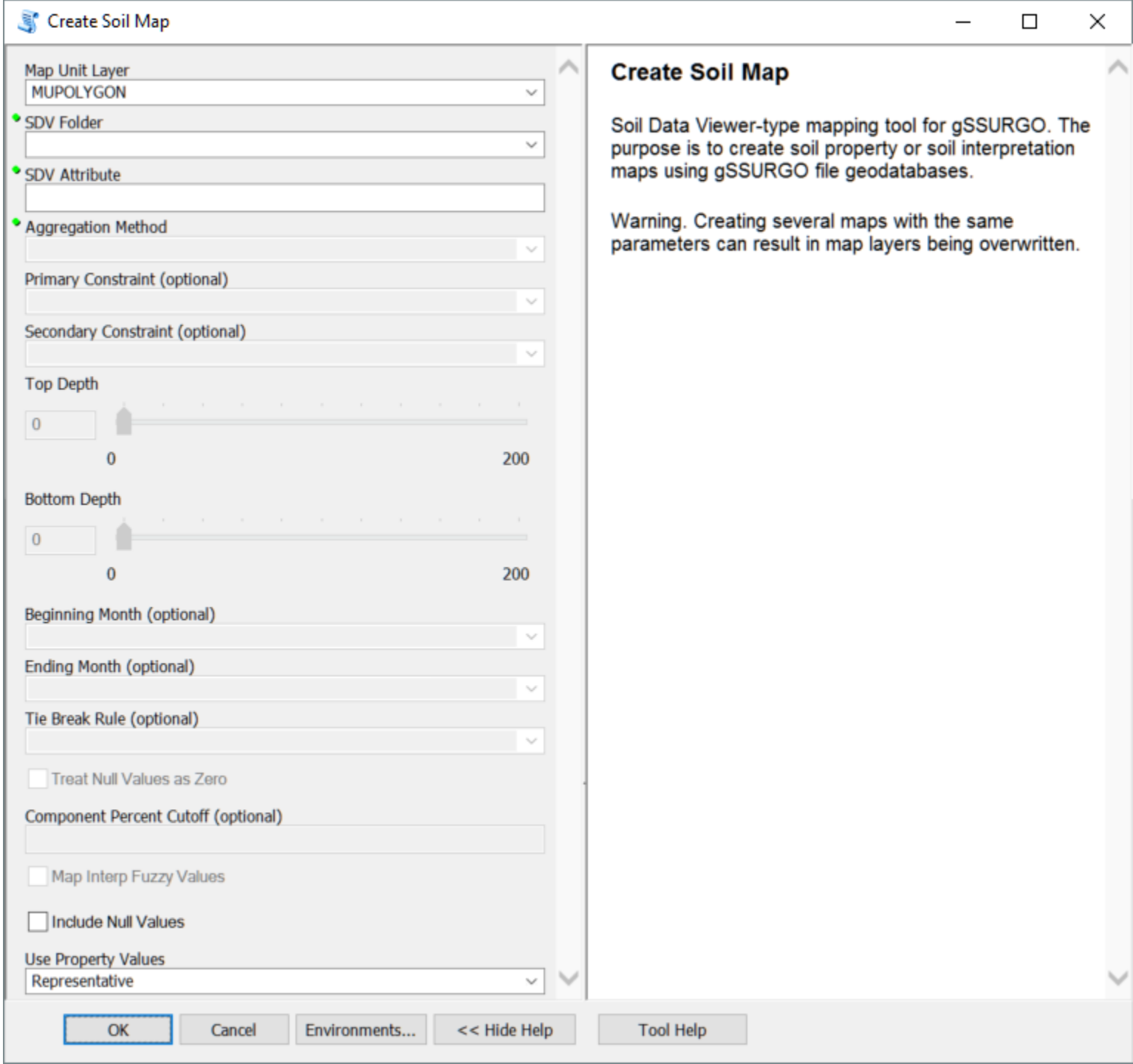
Parameters will have a default setting which normally does not be changed unless the user has a specific reason for doing so.



1

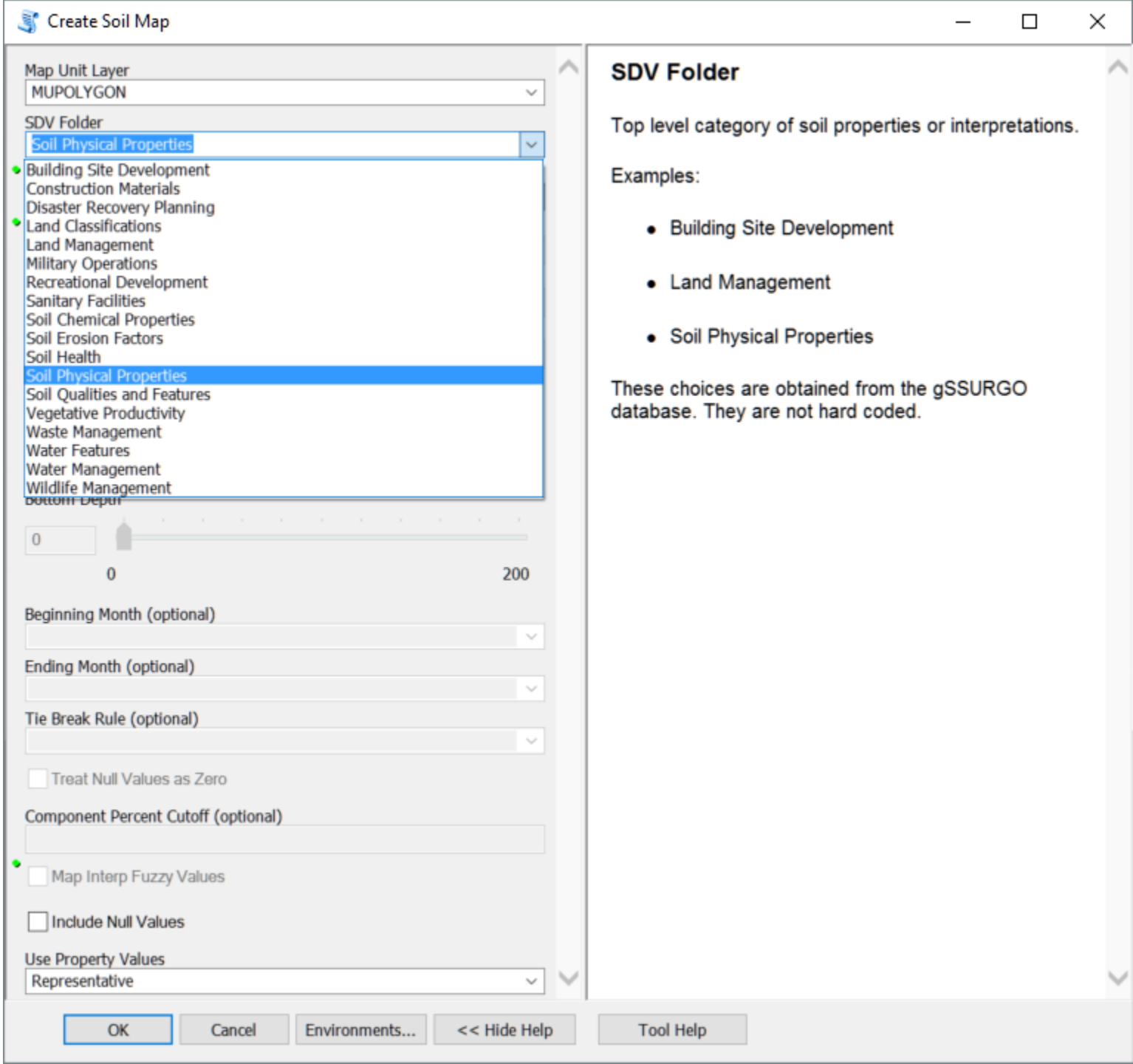
If a single soil polygon layer containing MUKEY is found in the ArcMap table of contents (TOC), that layer will be automatically selected in the first parameter.

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



2

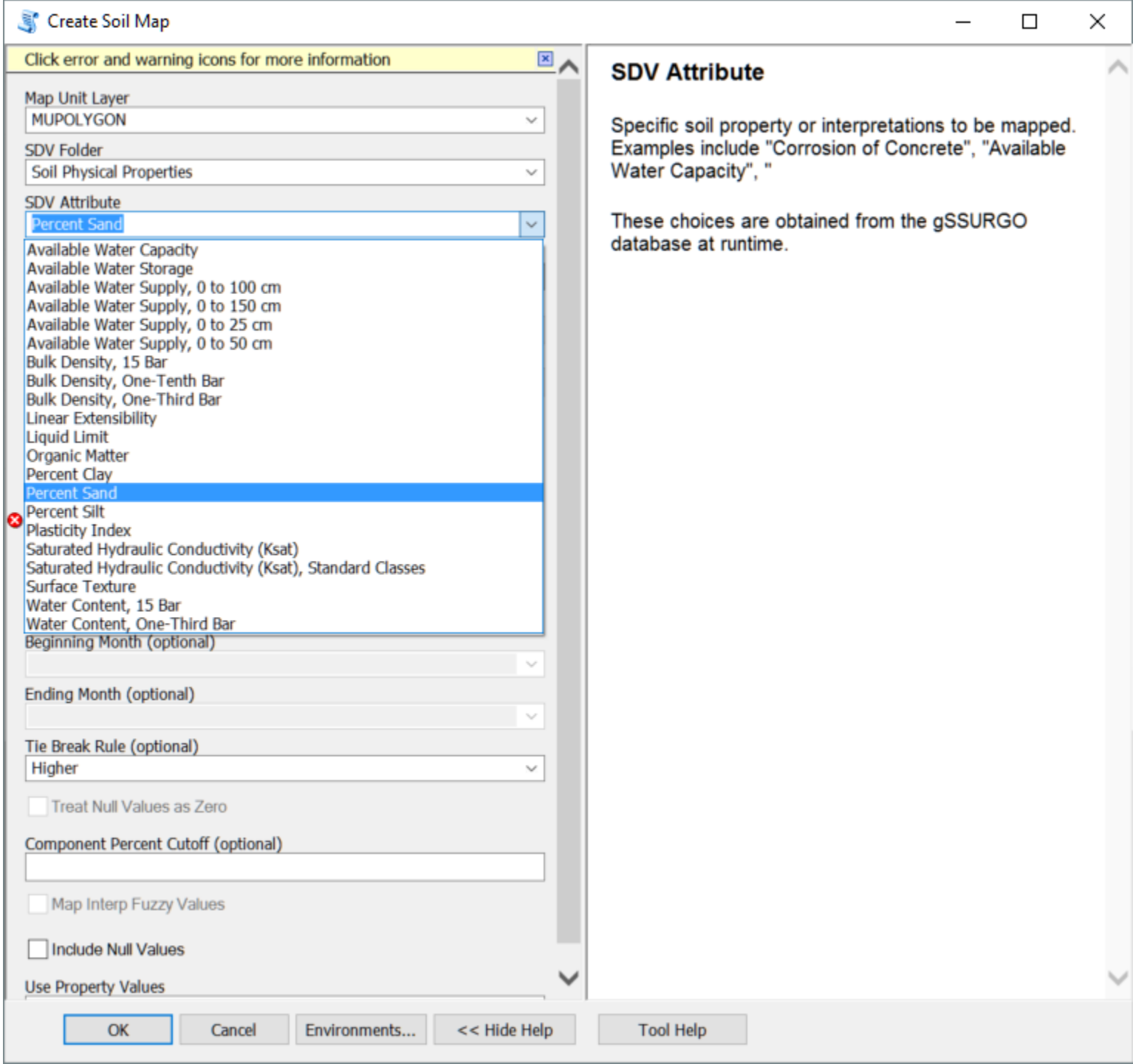
The ‘SDV Folder’ parameter has 17 different choices. The ‘Wildlife Management’ choice may not be always be used.



3

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

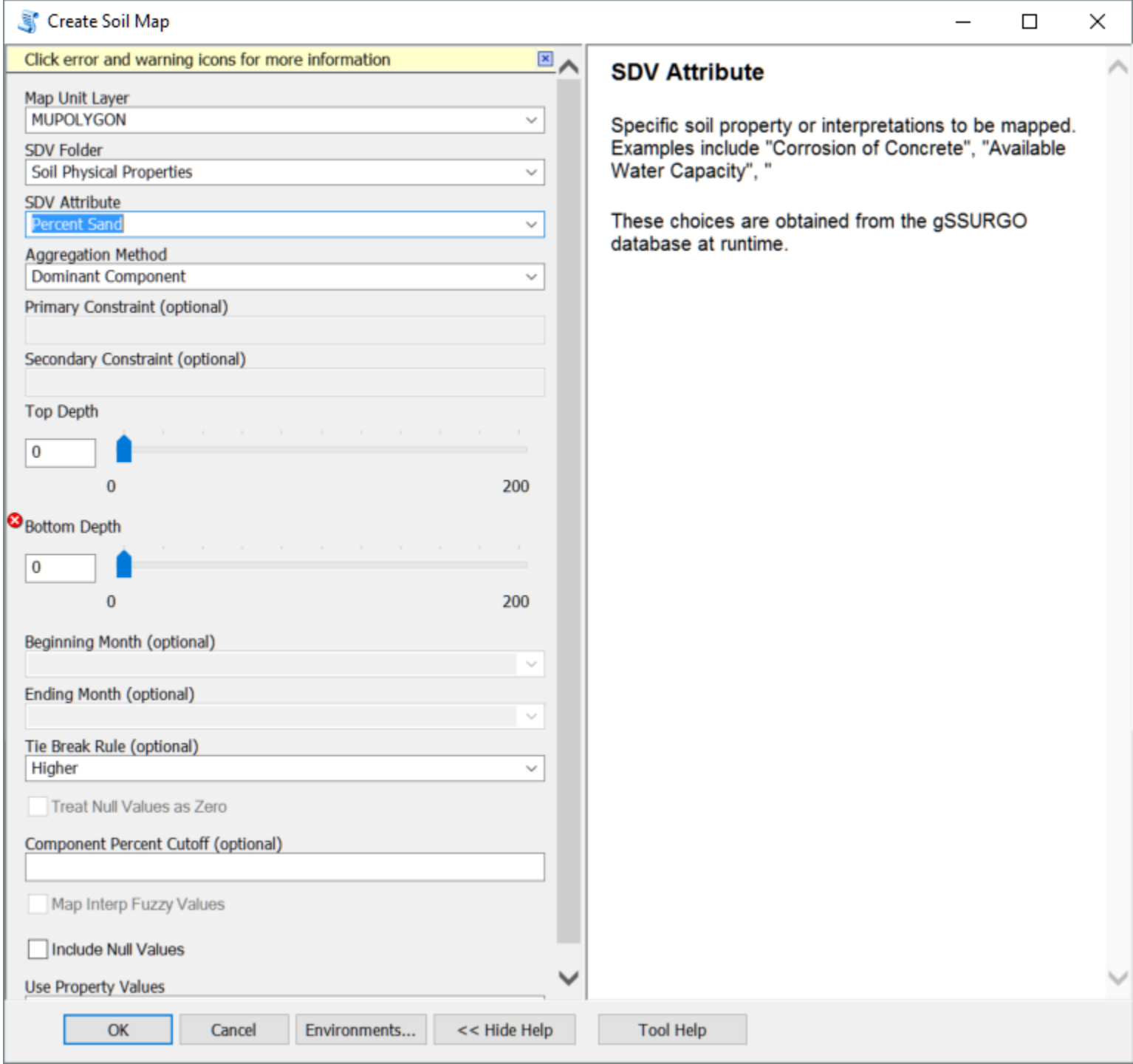
In all, there are over 160 possible selections for soil properties or interpretations, not including custom state versions.



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

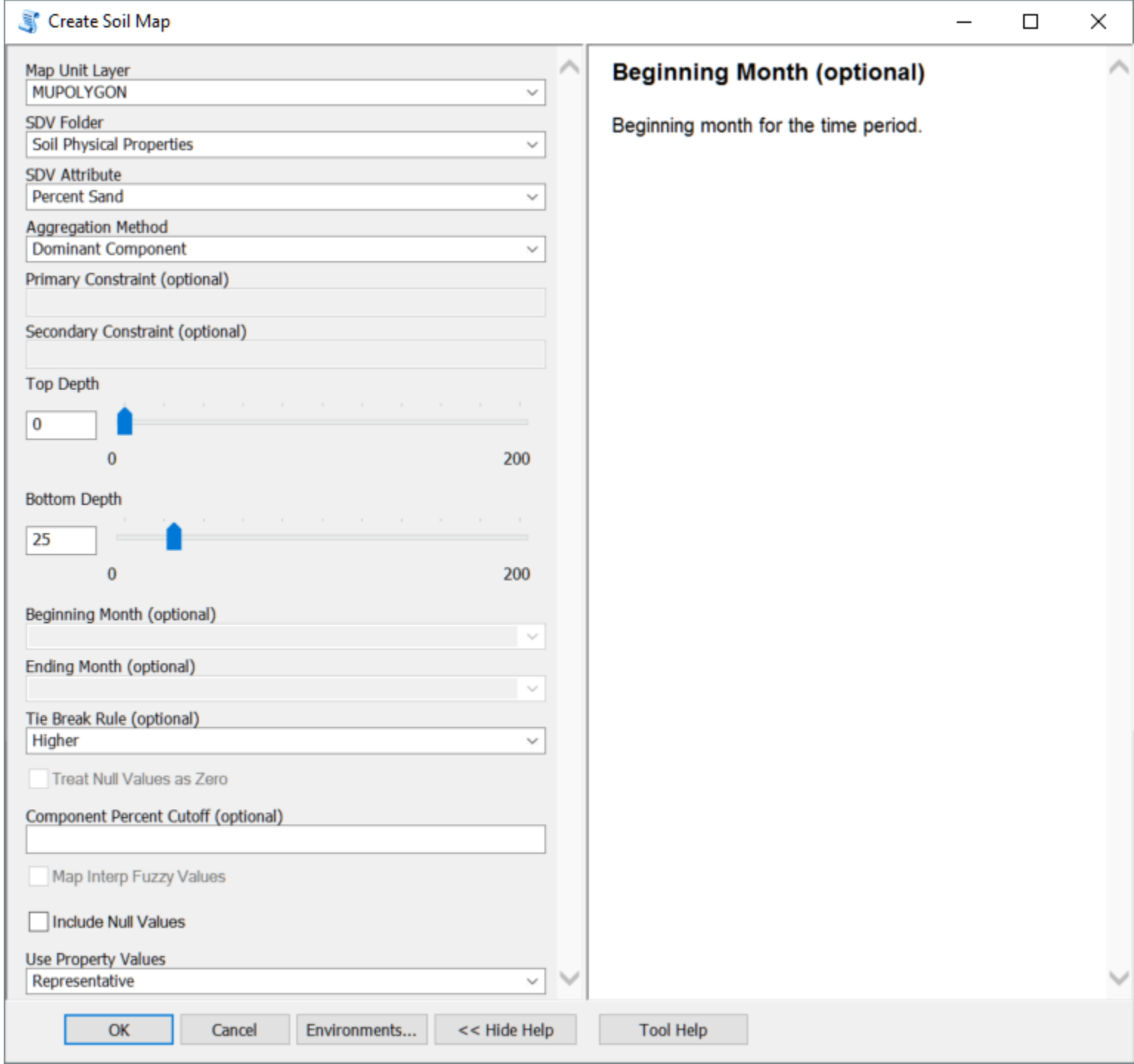
8

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.



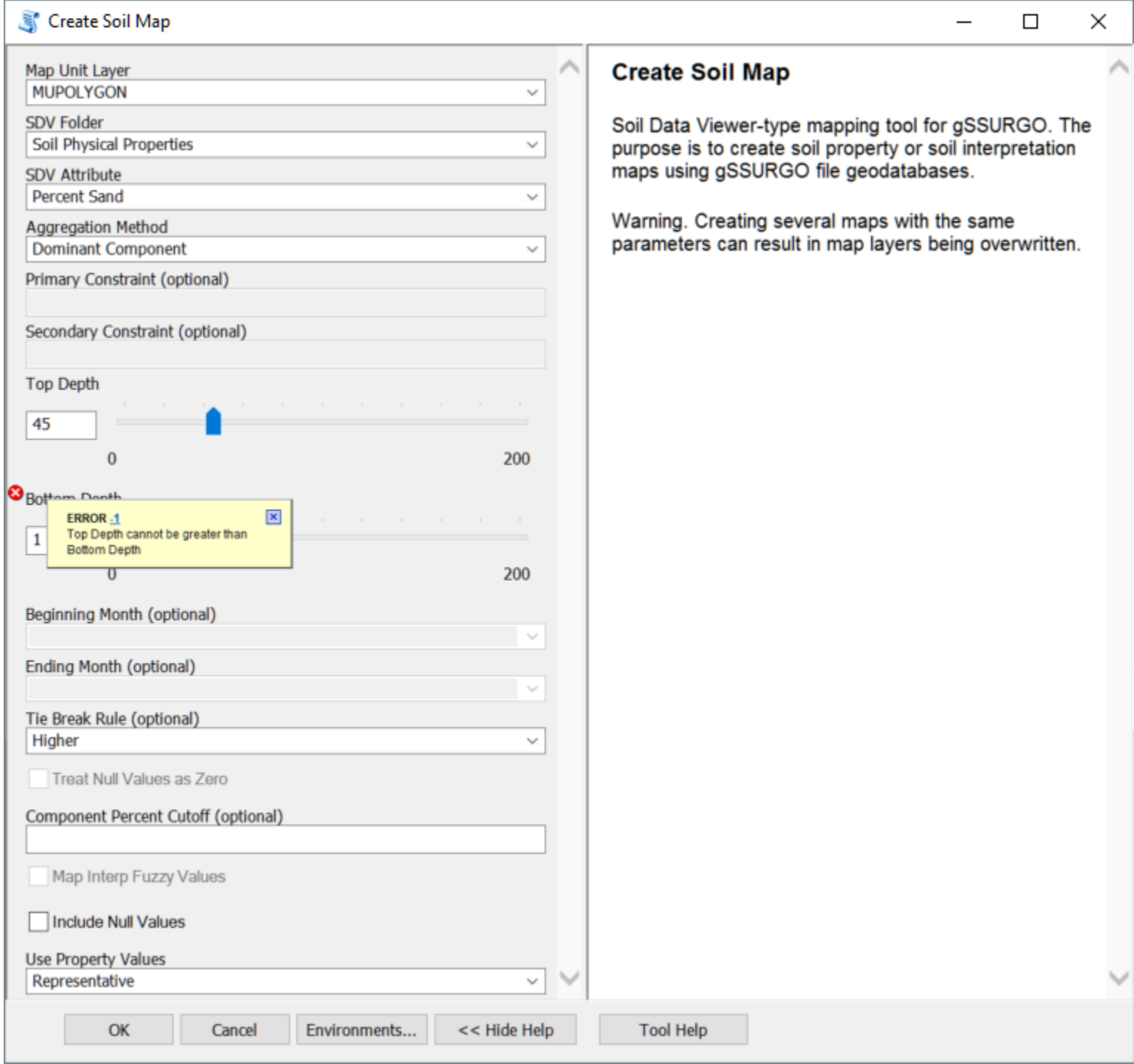
Top depth setting always defaults to the surface (0 centimeter). To only report properties for the surface horizon, set the top depth to 0 and bottom depth to 1 cm.

8



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.

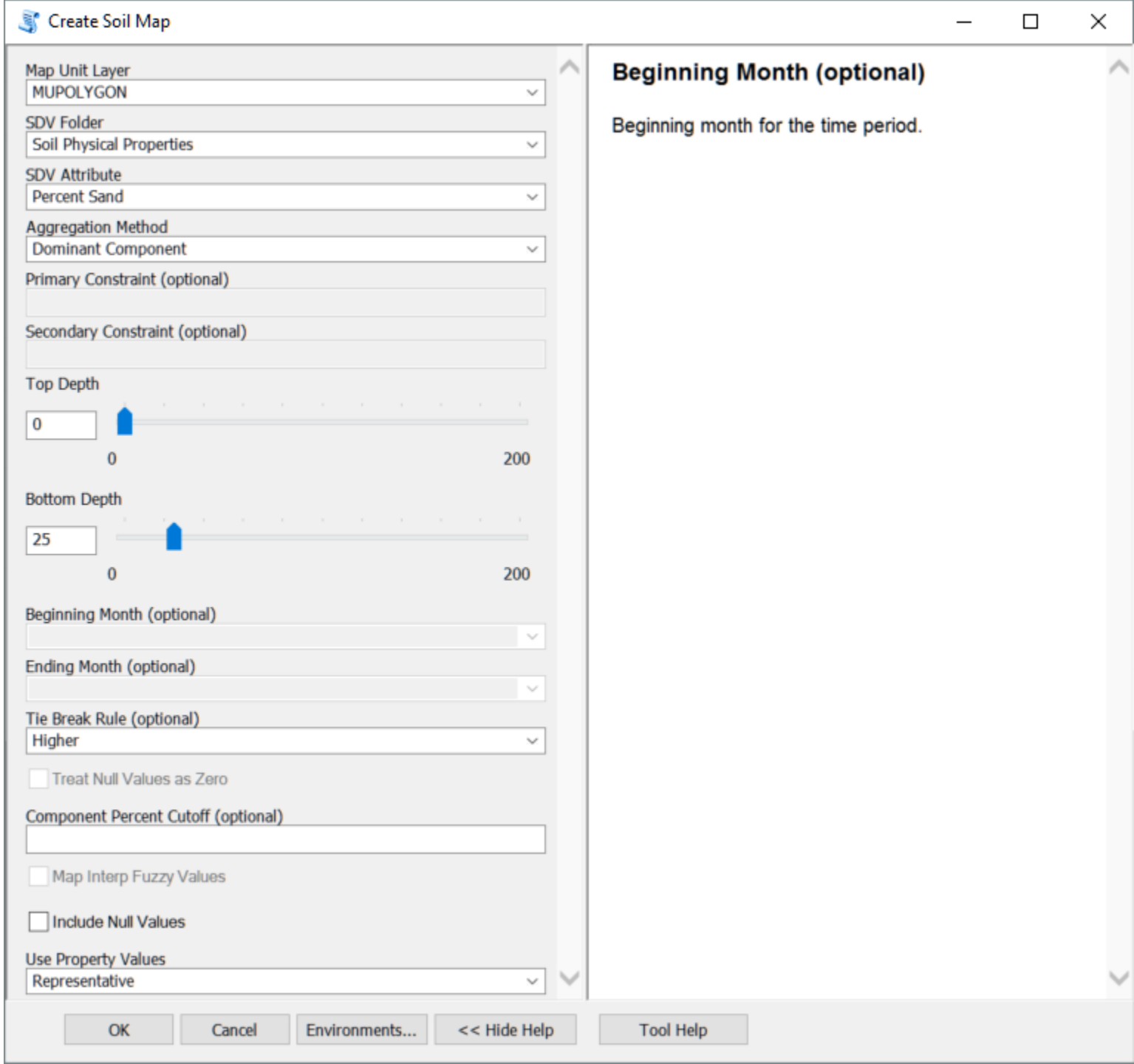
8



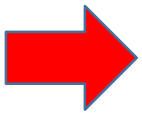
For ‘Percent Sand’, the ‘Beginning Month’ and ‘Ending Month’ parameters have no application and are disabled.

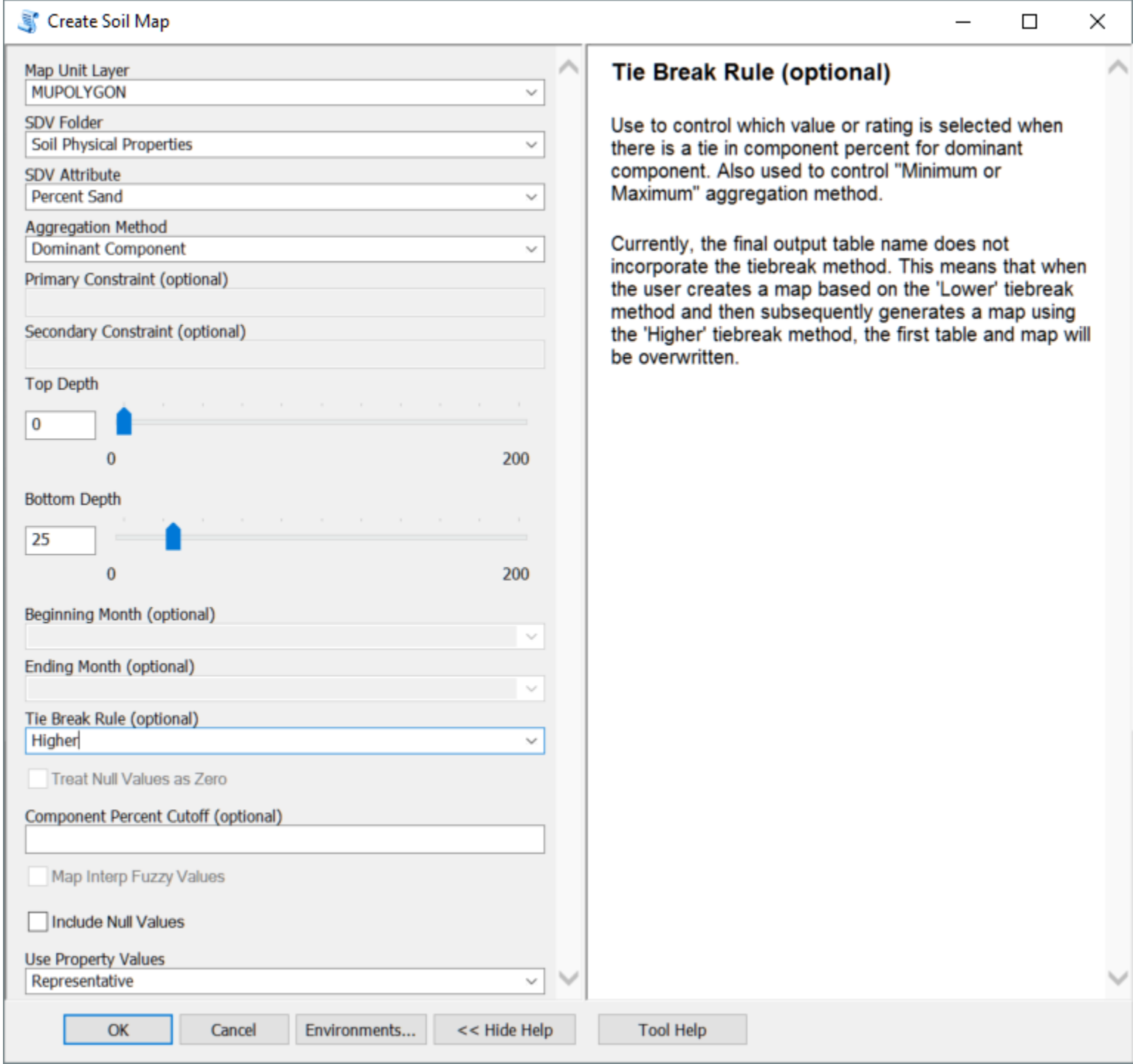
9

10

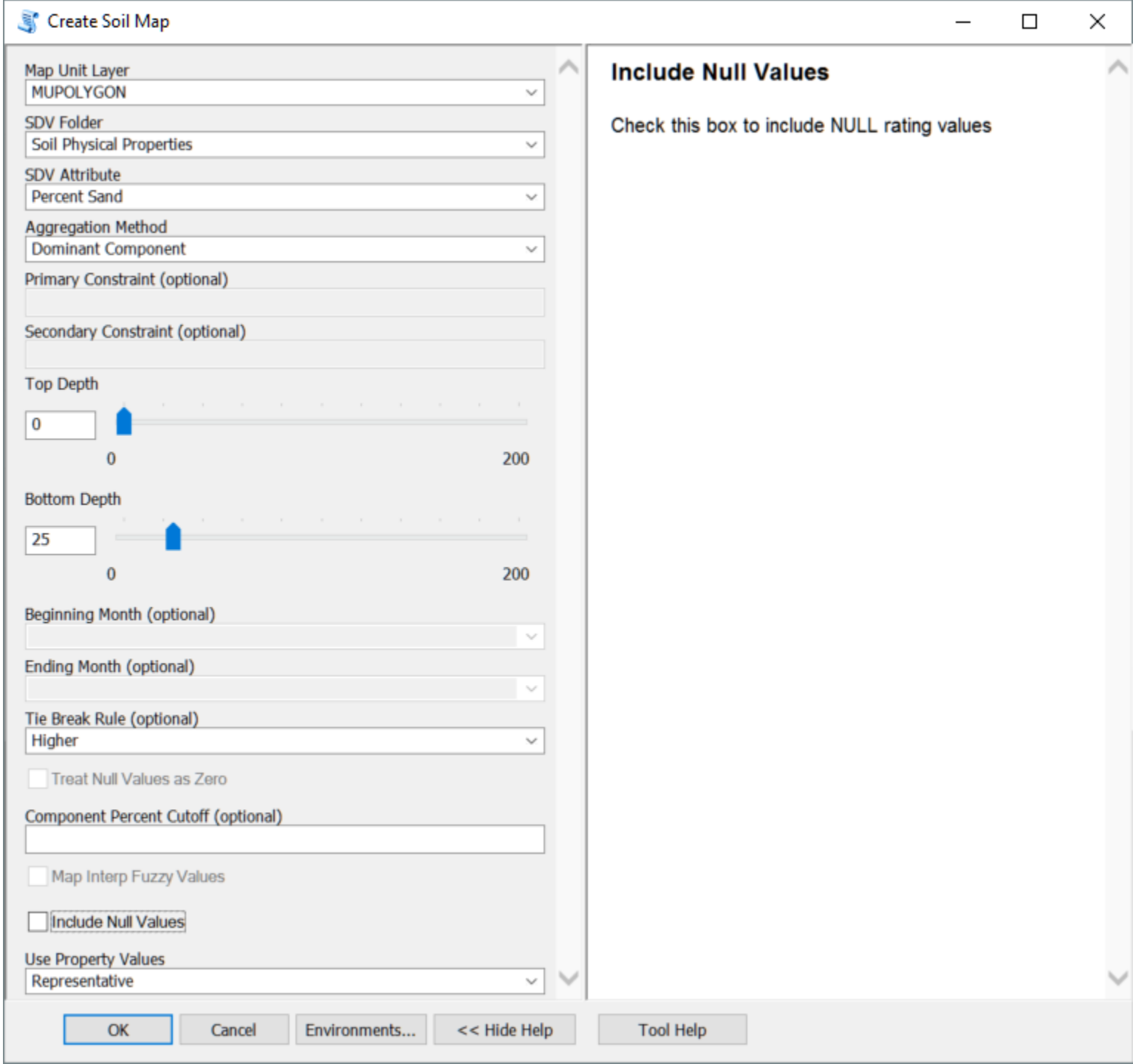


The Tie Break Rule controls which rating or property value is reported in case of a tie in component percent.





The ‘Include Null Values’ parameter controls how null values in certain numeric 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.

Create Soil Map

Map Unit Layer
MUPOLYGON

SDV Folder
Disaster Recovery Planning

SDV Attribute
Catastrophic Mortality, Large Animal Disposal, Pit

Aggregation Method
Weighted Average

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)
Higher

Treat Null Values as Zero

Component Percent Cutoff (optional)

Map Interp Fuzzy Values

Include Null Values

Use Property Values
Representative

Map Interp Fuzzy Values

Map soil interpretations using the weighted average fuzzy value (0.00 -> 1.00) for the map unit rather than the rating class (No limitation, Somewhat limited, etc).

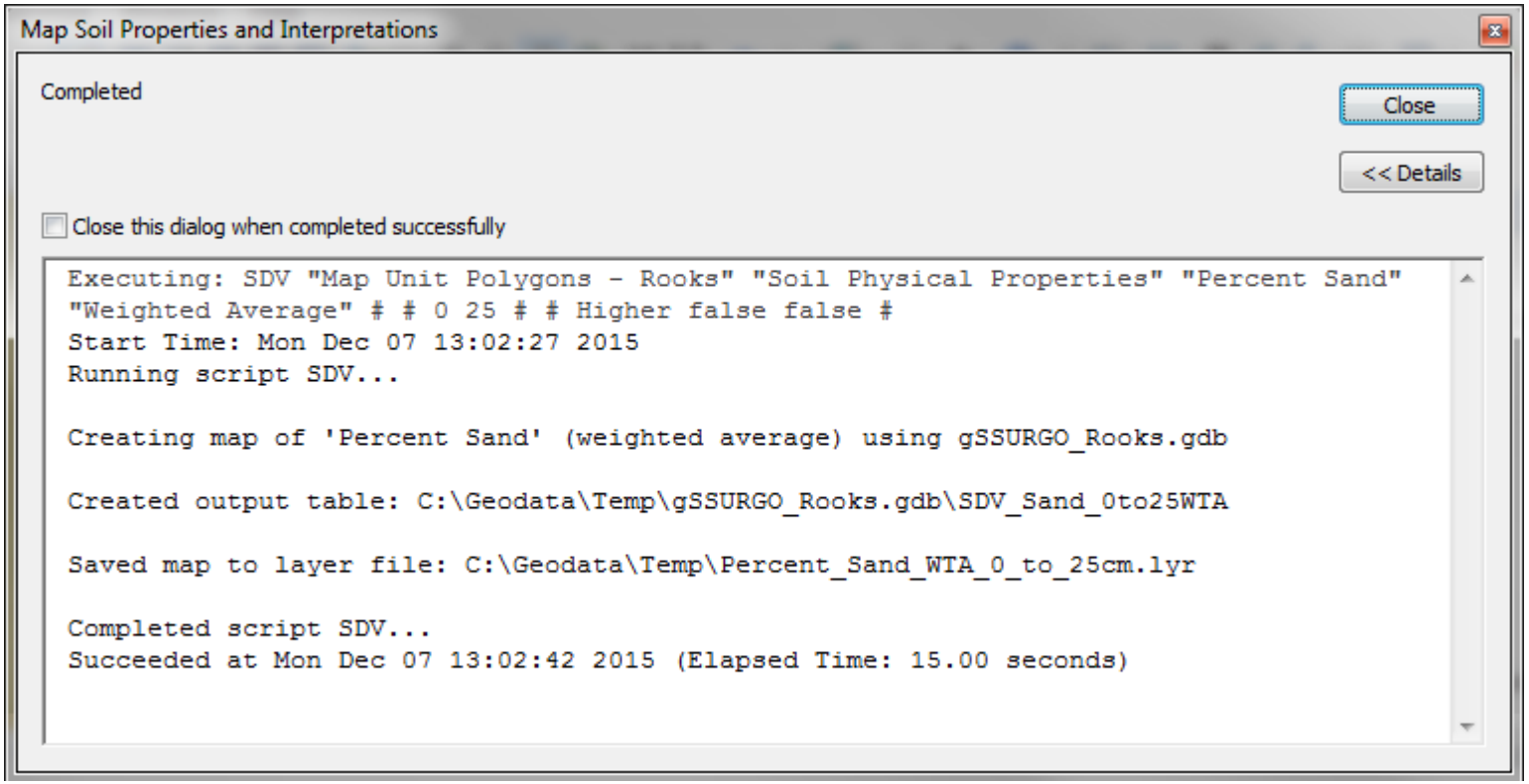
The 'Very limited' class would have a fuzzy value of 1.0

The 'Not limited' class would have a fuzzy value of 0

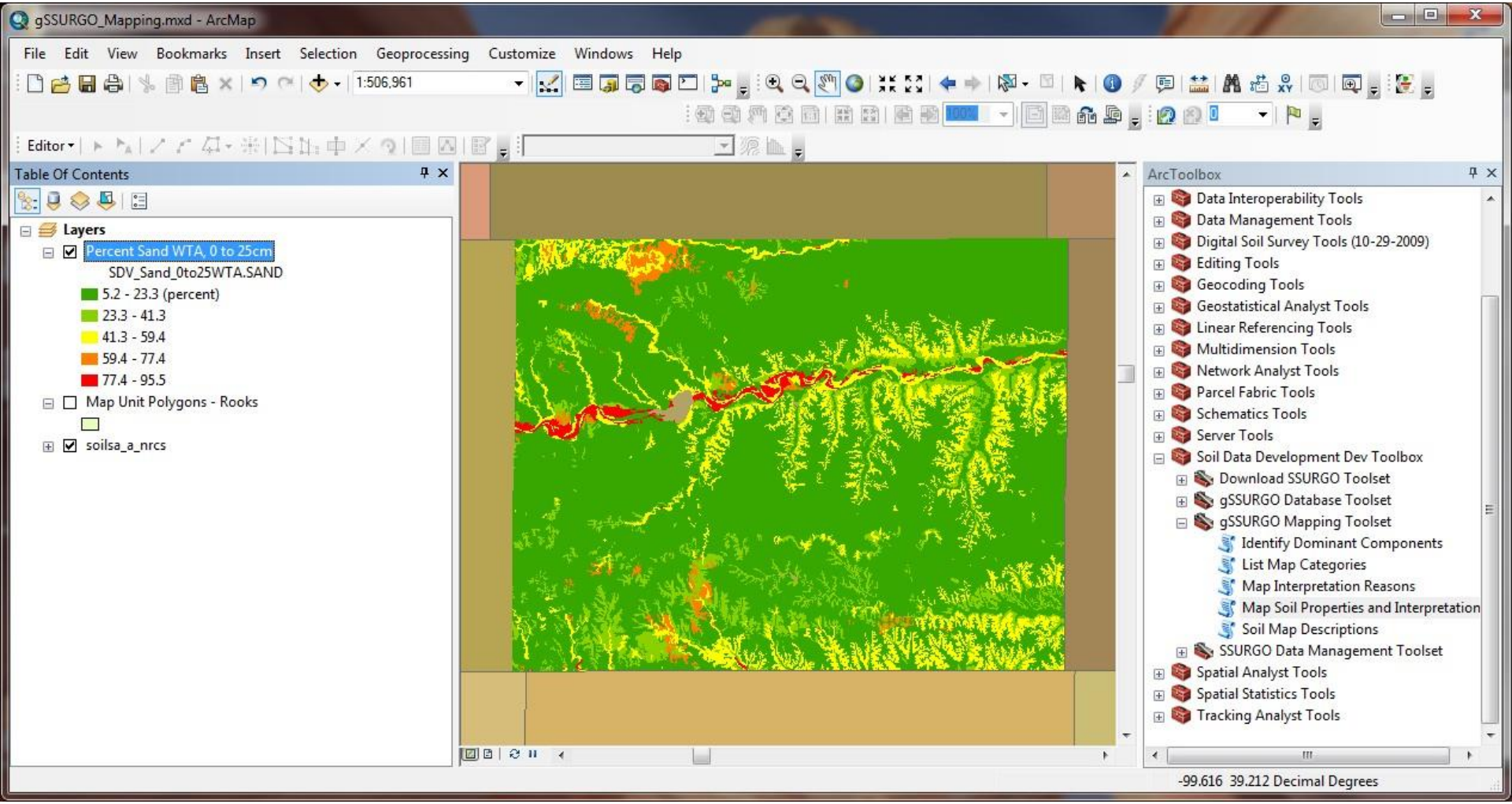
OK | Cancel | Environments... | << Hide Help | Tool Help

Below is an example of the console messages from the ‘Create Soil Map’ 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 ‘Create Soil Map’ tool for ‘Percent Sand’



Layer Descriptions

The 'Create Soil Map' 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 'Create Soil Map' 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.

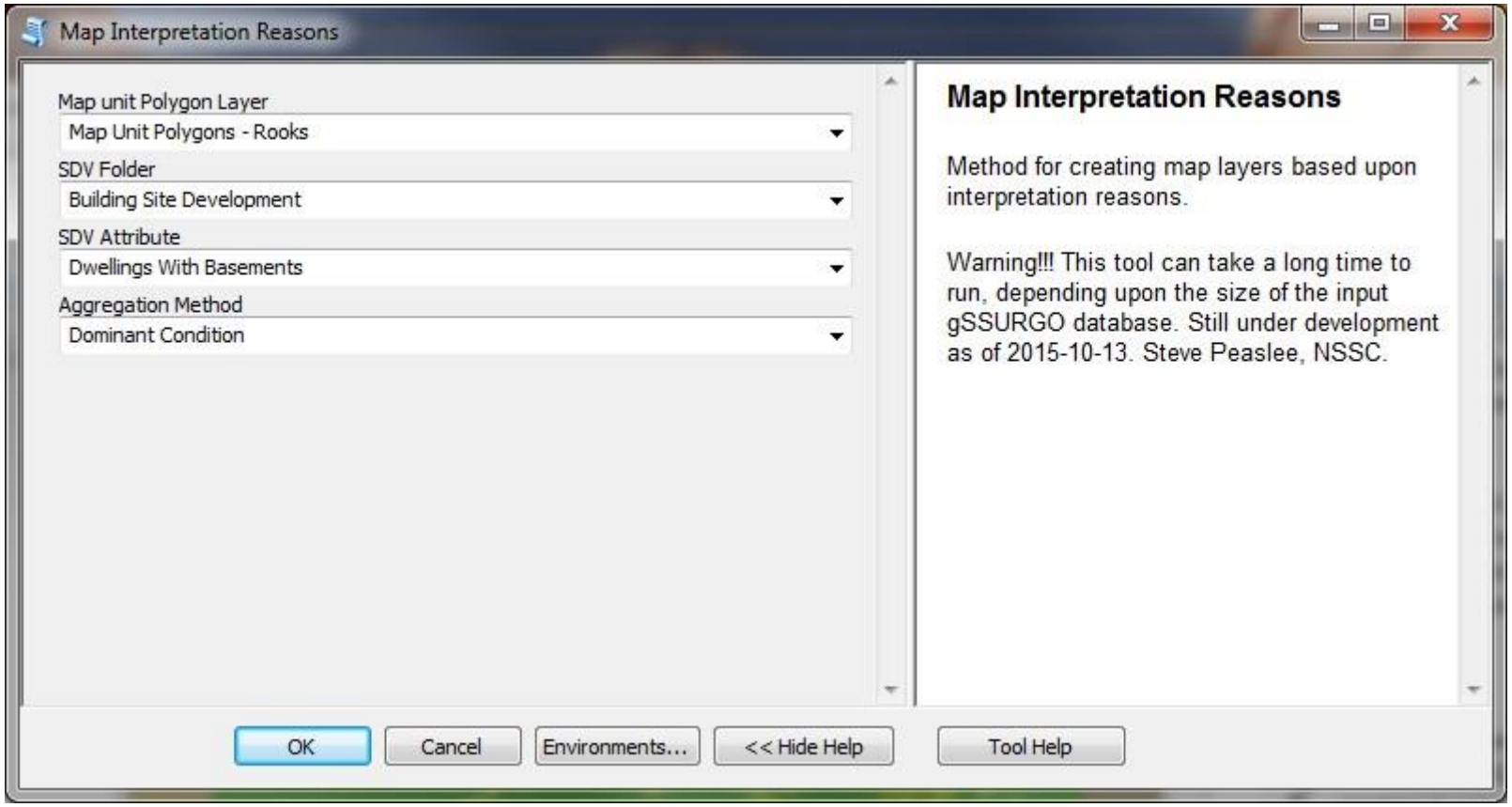
The tool creates layer symbology and temporarily joins the rating table to the soil polygon featureclass (MUPOLYGON). These settings are saved to the layer file and then the layer is added to the ArcMap table of contents (TOC). *Adding the MUPOLYGON featureclass to future ArcMap sessions will not automatically 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 accidently overwritten.

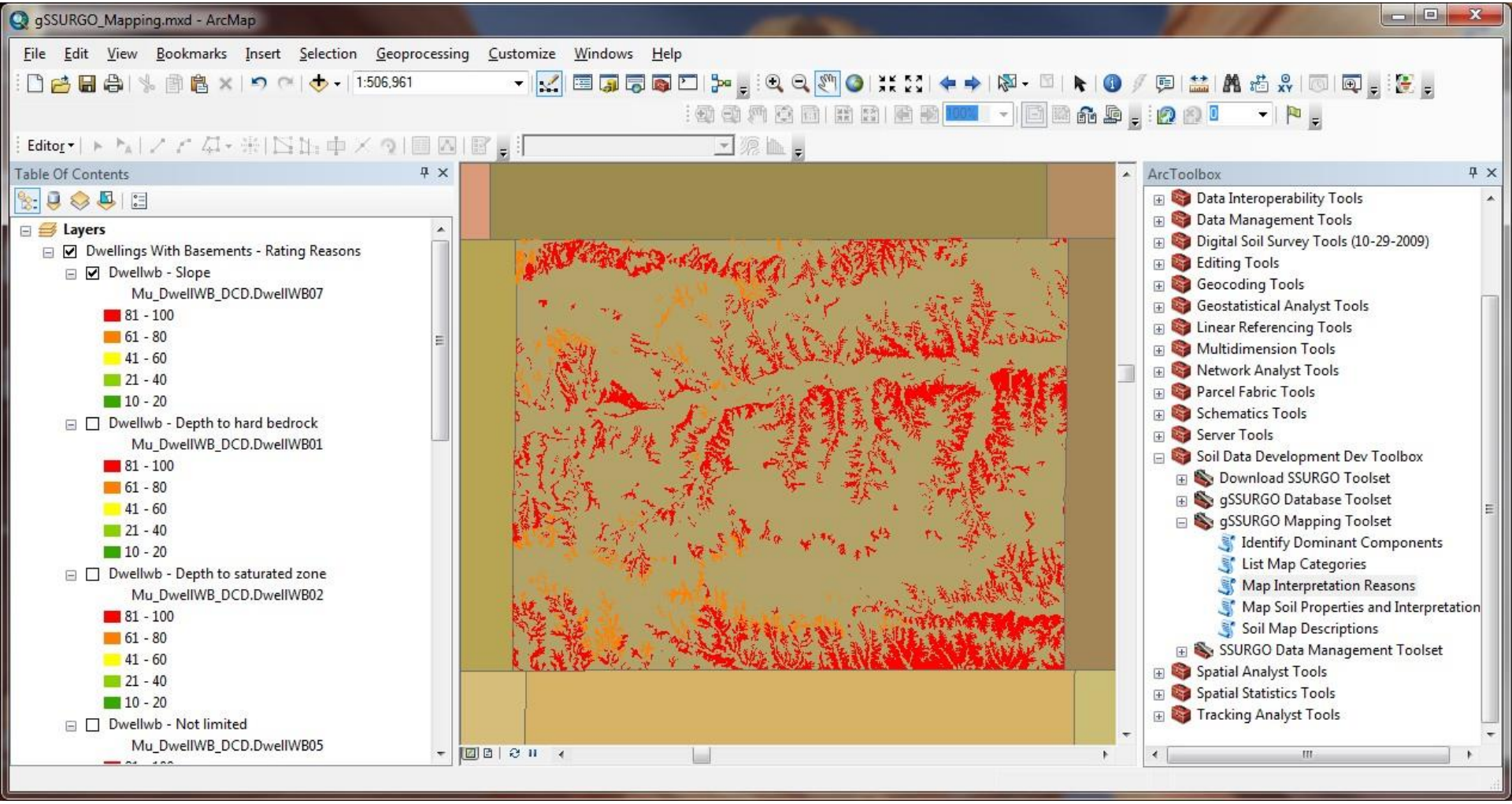
The output rating table names always begin with 'SDV_' and are created within the gSSURGO database. **These same rating tables can be joined to the MapunitRaster layer using the 'MUKEY' column.** Symbology will have to be manually created, but for large databases, drawing performance is greatly improved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

Map Interpretation Reasons

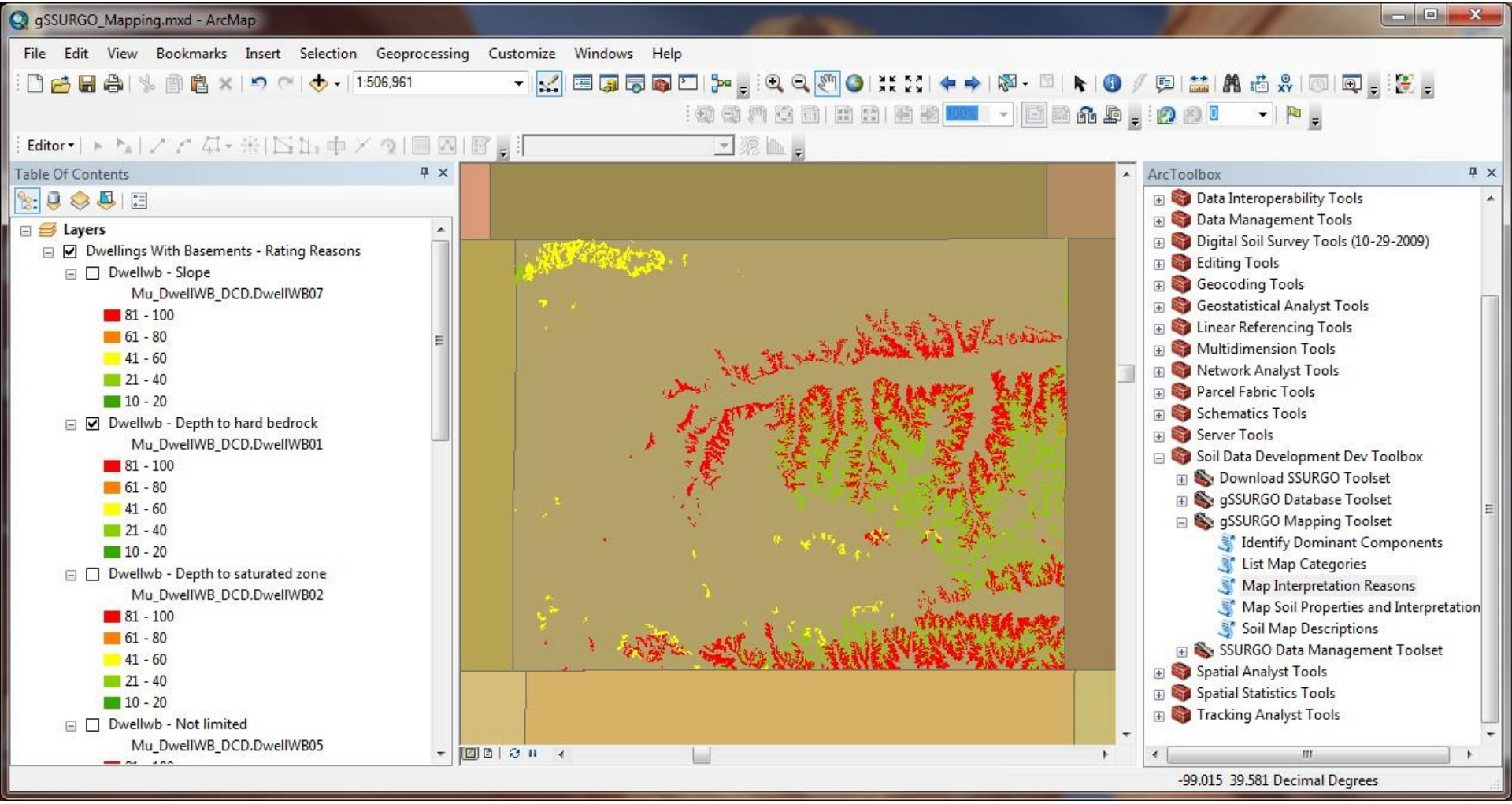
The 'Map Interpretation Reasons' tool is designed to map the extent and component percent of each of the limiting factors that go into the selected soil interpretation. Some interpretations can involve many factors and will thus generate a lot of map layers. Each layer is added to the ArcMap table of 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 limiting factor 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 limiting factor for the ‘Dwellings With Basements’ interpretations.



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