

United States Department of Agriculture



Soil Data Viewer Rule Manager 2.0 User Guide

Soil Survey Division
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SDV Rule Manager Application Introduction

The Soil Data Viewer Rule Manager (SDVRM) application allows authorized users to create and edit Soil Data Viewer rules and other Soil Data Viewer related entities (folders, map legends). A Soil Data Viewer rule (SDV rule) is a set of information that enables the Soil Data Viewer application to be able to aggregate a soil property or a soil interpretation to the map unit level, and create a corresponding thematic map.

An “SDV rule” should not be confused with a “NASIS rule”. In NASIS, a dynamically generated fuzzy logic soil interpretation is composed of a hierarchy of three components, NASIS properties, NASIS evaluations and NASIS rules. A soil interpretation is identified by the top most NASIS rule in this hierarchy. The name of this top most NASIS rule, NASIS rule name, is equivalent to the soil interpretation name. In this document, the term “rule” will never appear by itself. It will always appear either as “SDV rule” or “NASIS rule”. In the Soil Data Viewer Rule Manager application, the label “Rule” does sometimes appear by itself. Within the context of the SDV Rule Manager application, the lone label “Rule” always refers to an SDV rule.

Don’t Panic

All the average Soil Data Quality Specialist needs is yet another application that has to be learned and more data that needs to be created and maintained. The good news is that the vast majority of what is discussed in this User Guide are things that no state or MO Soil Data Quality Specialist will ever have to deal with. The only thing that a state and MO Data Quality Specialist *may* have to deal with is adding and maintaining SDV rules for non-national soil interpretations owned by their corresponding MO. To add a new SDV rule for a limitation, suitability or class soil interpretation, here is all that needs to be done:

1. Select the soil interpretation for which a new SDV rule should be added.
2. Specify a name for the corresponding SDV rule.
3. Create a description for the corresponding SDV rule.
4. Specify a default result column name.
5. Assign the corresponding SDV rule to a folder.
6. Select any specific land uses for which the corresponding SDV rule should be available in Web Soil Survey.

7. Submit the newly added SDV rule for review.

Everything other than step 3 can be done in a minute or two. Yes, writing yet another interpretation description is a pain, but that has nothing to do with the learning curve for this application.

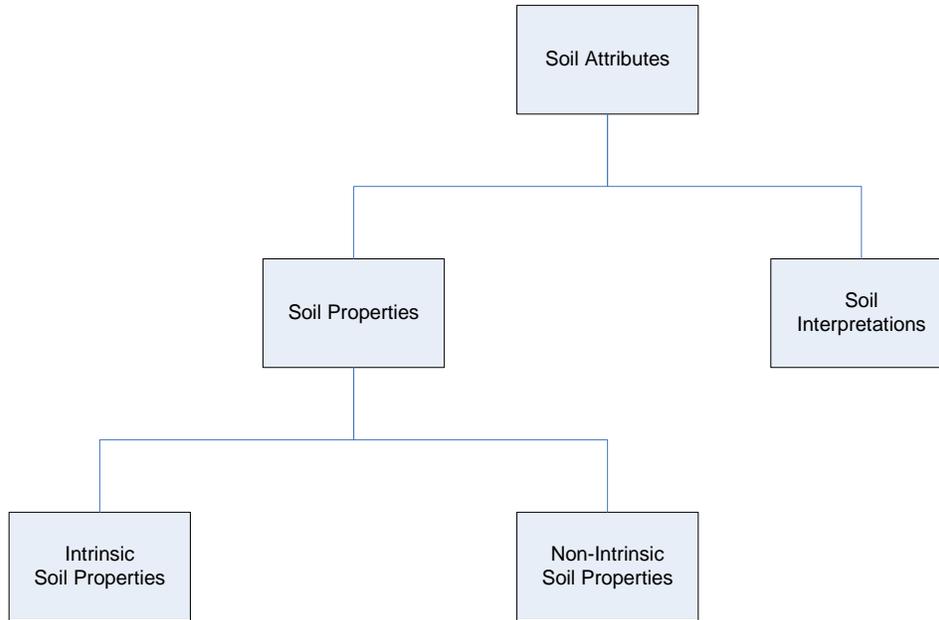
A little more work and knowledge is required to add a new SDV rule for a class soil interpretation, but not much. So please don't let the size of this User Guide intimidate you. It's the people with national soil data quality responsibilities that should worry.

Soil Attributes, Client Soil Data Viewer and Web Soil Survey

The SDV rules, folders and map legends managed by this application are shared by Client Soil Data Viewer and Web Soil Survey. Which SDV rules appear in which folders does not vary between these two applications, and in both applications, all soil property SDV rules are always available, but a soil interpretation SDV rule is not available unless the corresponding soil interpretation is present in the underlying soil data for the current area of interest. Which SDV rules and folders are available and visible at any given moment can vary between Client Soil Data Viewer and Web Soil Survey.

To understand how things differ between Client Soil Data Viewer and Web Soil Survey, we need to establish some definitions. Soil attributes can be divided into two broad categories, soil properties and soil interpretations. A soil interpretation, as far as Soil Data Viewer is concerned, corresponds to a NASIS fuzzy logic soil interpretation. A soil property is any soil attribute that is not a NASIS fuzzy logic soil interpretation. Although there are many SDV rule attributes in common between a soil property SDV rule and a soil interpretation SDV rule, there are enough attributes that differ that data entry for a soil property SDV rule is discussed separately from data entry for a soil interpretation SDV rule.

Soil properties themselves can be divided into two broad categories, intrinsic soil properties and non-intrinsic soil properties. Intrinsic soil properties are those empirical soil properties that are not based on any other soil properties. Non-intrinsic soil properties tend to be derived from multiple intrinsic soil properties. Non-intrinsic soil properties tend to be interpretive in nature. Examples of non-intrinsic soil properties include Farmland Classification, T Factor and Wind Erodibility Group.



Soil Data Viewer Soil Attribute Classification Hierarchy

So how does Client Soil Data Viewer differ from Web Soil Survey? In Client Soil Data Viewer, all SDV rules & folders are always available on tab “Attribute Folders”. In Web Soil Survey, soil interpretation SDV rules and folders and non-intrinsic soil property SDV rules and folders are available on Soil Data Explorer sub-tab “Limitations and Suitabilities for Use”. Intrinsic soil property SDV rules and folders are available on Soil Data Explorer sub-tab “Soil Properties and Qualities”. Both of these Soil Data Explorer sub-tabs are not visible at the same time. In other words, Web Soil Survey separates interpretive and non-interpretive soil attributes and folders, and Client Soil Data Viewer does not.

The other major difference between Client Soil Data Viewer and Web Soil Survey is that for interpretive soil attributes (soil interpretations and non-intrinsic soil properties), Web Soil Survey filters which SDV Rules are available at any given time by land use, and Client Soil Data Viewer does not. This means that for Web Soil Survey, one must establish all necessary land use associations for any soil interpretation or non-intrinsic soil property SDV rule, prior to making that SDV rule available in Web Soil Survey. Intrinsic soil properties are considered to be independent of land use, so no such associations are required for an intrinsic soil property SDV rule.

How is “intrinsic” versus “non-intrinsic” specified? Because we decided that a folder should never contain a mixture of intrinsic soil properties and non-intrinsic soil properties and soil interpretations, we made “intrinsic” an attribute of a folder, rather than an attribute of an SDV rule. An SDV rule is classified as intrinsic or non-intrinsic, based on its folder association, and since (1) an SDV rule must be associated with one and only one folder, and (2) we don’t allow a soil interpretation SDV rule to be associated with an intrinsic soil property folder, there should never be any ambiguity.

Application Authorization

1. To use the SDV Rule Manager application, you must be explicitly authorized via the USDA eAuthentication system. To be granted authorization to use this application, please send an e-mail request to the Soils Hotline at soilshotline@lin.usda.gov. Please include your USDA eAuth ID
2. General application authorization via USDA eAuth allows you to select and view and Soil Data Viewer related objects (SDV rule, folder, map legend), but if you want to be able to add, edit and delete SDV related objects owned by a particular NASIS site, you must also be a member of group “Soil Data Viewer” for that NASIS site. Only someone who is a NASIS Site Administrator should add you to that site’s “Soil Data Viewer” group. You should not ask the Soils Hotline staff to do this for you.

All soil interpretations in NASIS are owned by a particular NASIS site. Any soil interpretation SDV rule is owned by the same NASIS site that owns that SDV rule’s corresponding soil interpretation. In other words, soil interpretation SDV rule ownership is inherited from the corresponding soil interpretation.

All soil property SDV rules, folders and map legends are considered to be owned by NASIS site “NSSC Pangaea”.

This means that MO and state office users will be restricted to adding and maintaining SDV rules for soil interpretations owned by their corresponding MO(s). Such users can concentrate on the sections of this user guide that discuss managing soil interpretation SDV rules. Such a user will still need a basic understanding of folder and map legend conventions, since every SDV rule must be associated with both a folder and a map legend.

There is nothing that prevents a user from being a member of group “Soil Data Viewer” for any NASIS site, including “NSSC Pangaea”. Many state users will potentially need to be a member of group “Soil Data Viewer” for multiple NASIS sites.

Accessing the Soil Data Viewer Rule Manager Application

The Soil Data Viewer Rule Manager application is a web application with the following URL:

<http://sdvrulemanager.sc.egov.usda.gov>

You will be required to login using USDA eAuthentication before being granted access to this application.

All application testing was done using some 7.x version of Internet Explorer. Since this is strictly an NRCS application, and since Internet Explorer is one of our officially sanctioned browsers, no other browsers were tested. There is no guarantee that any other browser will necessarily work with this application.

Losing Your Changes Due to a Timeout

The Soil Data Viewer Rule Manager application is a web application, which means that after a period of time, it will time out, and any pending changes that haven't been saved will be lost. For this reason you should always save early and often.

For a newly created SDV rule, very few required fields have no default. As long as you don't set "Ready for Review", the only required fields with no default are "Rule Name", "Rule Description" and "Default Result Column Name". All of these fields reside on the tab labeled "General". If you stub in something for all three of these fields, you can then immediately save a newly created SDV rule.

When you do set "Ready for Review", on the Folder / Land Uses tab, selecting a folder is then required.

Soil Data Viewer Rule Manager Application Main Menu

In the SDV Rule Manager application, the menu shown below is always visible on the left side of the browser window.

Rules

- [Select](#)
- [Add Property Rule](#)
- [Add Interpretation Rule](#)
- [Find Interpretations without Rules](#)

Folders

- [Select](#)
- [Add](#)

Map Legends

- [Select](#)
- [Add](#)

Miscellaneous

- [Help](#)
- [User Guide](#)

Soil Data Viewer Rule Manager Main Menu

Rules

Select

This option allows you to search for an existing SDV rule. You must select a particular SDV rule before you can view, edit or delete that rule. The details of selecting an existing SDV rule are discussed in the section titled “Selecting an Existing SDV Rule”. The details of editing an existing SDV rule are discussed in the sections titled “Editing an Existing Soil Property SDV Rule” and “Editing an Existing Soil Interpretation SDV rule”.

Add Property Rule

The option initiates the process of adding a new soil property SDV rule. The details of adding a new soil property SDV rule are discussed in the section titled “Any authorized SDV Rule Manager user can select and view any existing soil property SDV rule.

Adding a New Soil Property SDV Rule”.

Add Interpretation Rule

This is the first of two options for initiating the process of adding a new soil interpretation SDV rule. This option is typically used when you already know the soil interpretation for which you wish to add a corresponding SDV rule. Both options first require you to select the soil interpretation for which you wish to add a corresponding SDV rule. The details of selecting a soil interpretation are discussed in the section titled “Selecting a Soil Interpretation”. The details of adding a new soil interpretation SDV rule are discussed in the section titled “Adding a New Soil Interpretation SDV Rule”.

Find Interpretations without Rules

This is the second of two options for initiating the process of adding a new soil interpretation SDV rule. This option is typically used when you are searching for soil interpretations for which a corresponding SDV rule may need to be added. Both options first require you to select the soil interpretation for which you wish to add a corresponding SDV rule. The details of selecting a soil interpretation are discussed in the section titled “Selecting a Soil Interpretation”. The details of adding a new soil interpretation SDV rule are discussed in the section titled “Adding a New Soil Interpretation SDV Rule”.

Folders

Select

This option allows you to select an existing folder. You must select a particular folder before you can view, edit or delete that folder. Clicking this option displays a list of all existing folders. To view a particular folder, click the binoculars icon to the left of that folder. The details of editing an existing folder are discussed in the section titled “Editing an Existing Folder”.

Add

The option initiates the process of adding a new folder. The details of adding a new folder are discussed in the section titled “Adding a New Folder”.

Map Legends

Select

This option allows you to select an existing map legend. You must select a particular map legend before you can view, edit or delete that map legend. Clicking this option displays a list of all existing map legends. To view a particular map legend, click the binoculars icon to the left of that map legend. The details of editing an existing map legend are discussed in the section titled “Editing an Existing Map Legend”.

Add

The option initiates the process of adding a map legend. The details of adding a new map legend are discussed in the section titled “Adding a New Map Legend”.

Miscellaneous

Help

This is a wholly gratuitous link to an application help page that no one ever really reads. Actually, if you ever need to know what wildcard characters can be used when searching for SDV rule names or soil interpretation names, you’re going to have to break down and visit this page.

User Guide

Clicking this link brings up a copy of this User Guide in a separate browser window, so long as you have some sort of PDF viewer, like Adobe Reader, installed on your system.

Selecting an Existing SDV Rule

To view, edit or delete an existing SDV rule, you first have to select that SDV rule. This can be done by selecting “Rules: Select”. This brings up a page where you can query for existing SDV rules by form.

Select Rule

Rule Type:	All Types	<p>The fields to the left are used to find all rules that meet the specified criteria.</p> <p>Wildcard characters may be entered in the Rule Name and Interpretation fields. See the Help page for more information.</p> <p>You are not prevented from entering values that are mutually exclusive. For example, nothing will ever be returned when Rule Type is set to “Property” and any value is entered for “Interpretation”, because Interpretation only pertains when Rule Type is either “Interpretation” or “All Types”.</p>
Rule Name:		
Property Table Name:	All Tables	
Interpretation:		
NASIS Site:	All Sites	

Select Rule Form

This form includes the following fields.

1. Rule Type

This field allows you to either search for soil interpretation SDV rules (Interpretation), soil property SDV rules (Property), or both soil interpretation and soil property SDV rules (All Types).

2. Rule Name

This field allows you to search for SDV rules whose names “match” the contents of this field. See the SDV Rule Manager’s help page for a description of allowable wild card characters. If no wild card characters are used, the name entered here must match an existing SDV rule name, verbatim.

3. Property Table Name

This field allows you to search for soil property SDV rules based on any column in the database table selected from this drop down list.

4. Interpretation

This field allows you to search for soil interpretation SDV rules whose corresponding soil interpretation name “matches” the contents of this field. See the SDV Rule Manager’s help page for a description of

allowable wild card characters. If no wild card characters are used, the name entered here must match the soil interpretation name of an existing soil interpretation SDV rule, verbatim.

5. NASIS Site

This field allows you to search for SDV rules owned either by the selected NASIS site or by any NASIS site (All Sites), where the list of NASIS sites is restricted to those NASIS sites that can create SDV rules.

You may specify a value for none or any number of these fields. When a value is specified for more than one of these fields, the SDV rule must match all specified criteria. Note that it is possible to specify multiple criteria for which no SDV rule will ever be returned.

This search returns selected SDV rules in a scrollable grid.

Rules found: 127

Type	Property/Interpretation	Rule Name	Result Column	NASIS Site
Interpretation	URB/REC - Picnic Areas	Picnic Areas	PicnicArea	NSSC Pangaea
Interpretation	URB/REC - Playgrounds	Playgrounds	Playground	NSSC Pangaea
Interpretation	WMS - Embankments, Dikes, and Levees	Embankments, Dikes, and Levees	EmbDikLev	NSSC Pangaea
Interpretation	WMS - Excavated Ponds (Aquifer-fed)	Excavated Ponds (Aquifer-fed)	ExPndAqFed	NSSC Pangaea
Interpretation	WMS - Pond Reservoir Area	Pond Reservoir Area	PndResArea	NSSC Pangaea
Property	chorizon.awc_r	Available Water Capacity	AWC	NSSC Pangaea
Property	chorizon.caco3_r	Calcium Carbonate (CaCO3)	CaC03	NSSC Pangaea
Property	chorizon.cec7_r	Cation Exchange Capacity (CEC-7)	CEC7	NSSC Pangaea
Property	chorizon.claytotal_r	Percent Clay	Clay	NSSC Pangaea
Property	chorizon.dbfifteenbar_r	Bulk Density fifteen bar	Db15bar	NSSC Pangaea

Selected SDV Rules Grid

This grid includes the following columns:

1. Type

This indicates the SDV rule type, which must be either Interpretation or Property.

2. Property / Interpretation

For a soil property SDV rule, this column identifies the table and column name on which the corresponding SDV rule is based. For a soil interpretation SDV rule, this column identifies the name of the NASIS soil interpretation on which the corresponding SDV rule is based.

3. Rule Name

This is the name by which the corresponding SDV rule is identified. No two SDV rules may have the same name.

This should not be confused with what we refer to as a “rule name” in NASIS. In NASIS we refer to a soil interpretation as a “NASIS rule”, and we refer to a soil interpretation name as a “NASIS rule name”.

4. Result Column

When a thematic map is generated for the corresponding SDV rule, this will be the default column name into which the corresponding map unit rating will be stored. A Soil Data Viewer user can change this default name at runtime.

5. NASIS Site

This is the name of the NASIS site that owns the corresponding SDV rule.

The records in the grid are sorted in ascending order by Type, Property / Interpretation and Rule Name. More than one SDV rule may be defined for a particular soil property, but one and only one SDV rule may be defined for a particular soil interpretation.

If any SDV rules were returned by your search, click the binoculars to left of that SDV rule’s record to view that SDV rule. You must view an SDV rule before you can request to edit or delete that rule.

Managing Soil Property SDV rules

Any authorized SDV Rule Manager user can select and view any existing soil property SDV rule.

Adding a New Soil Property SDV Rule

Only someone who is a member of group “Soil Data Viewer” for NASIS site “NSSC Pangaea” can add a soil property SDV rule.

Note that for any particular soil property; more than one SDV rule may be defined.

To add a new soil property SDV rule, select “Rules: Add Property Rule”.

Prior to general data entry you are required to select a column in a table in the table hierarchy whose root table is “mapunit”. Once general data entry commences, you cannot change the selected soil property.

Add Property Rule

Select the property for this rule:

Property Table Name:	chaashto
Property Column Name:	aashtoel

Continue

Add Soil Property SDV Rule Form

The list of table names is sorted in alphabetical order, by table physical name. Note that table “cointerp” is not included in the list. The only thing in table “cointerp” that makes sense to aggregation is a soil interpretation, and new soil interpretation SDV rules must be added by selecting either “Rules: Add Interpretation Rule” or Rules: Find Interpretations without Rules”.

One you have selected a table, you must then select a column within that table. The list of columns in the selected table is sorted in alphabetical order by column physical name. The column list includes only those columns where the corresponding logical data type is either “Float”, “Integer”, “Choice” (an alphanumeric attribute with a fixed domain, e.g. flooding frequency), “String” or “Narrative Text”, where the column physical name does

not end in the substring “key”. Columns whose logical data type is “Boolean” or “Date/Time”, and primary and foreign key columns cannot be aggregated.

If an SDV rule already exists for the selected table and column, you will be warned and asked if you wish to continue. More than one SDV rule may be defined for a given table and column, but it’s pretty rare. One case that existed at the time this was written was `chorizon.ksat_r`. In this case we wanted one SDV rule that had a natural break classes map legend and another SDV rule where the map legend class boundaries reflected the standard class boundaries defined for soil survey.

After selecting a table and column, some of the information needed for this soil property SDV rule is then extracted from a data dictionary, and any default values are established.

For data entry guidelines for soil property SDV rule attributes, please see the section titled “Soil Property SDV Rule Data Entry Guidelines”.

Editing an Existing Soil Property SDV Rule

Only someone who is a member of group “Soil Data Viewer” for NASIS site “NSSC Pangaea” can edit an existing soil property SDV rule.

To edit an existing SDV rule, you first have to select that SDV rule. Please see the section titled “Selecting an Existing SDV Rule” for a detailed discussion of the process of selecting an existing SDV rule in order to view, edit or delete that rule.

After selecting an SDV rule, if you are authorized to edit that rule an edit icon/link will be visible at the top of the form.

For data entry guidelines for soil property SDV rule attributes, please see the section titled “Soil Property SDV Rule Data Entry Guidelines”.

Deleting an Existing Soil Property SDV Rule

Only someone who is a member of group “Soil Data Viewer” for NASIS site “NSSC Pangaea” can delete an existing soil property SDV rule.

To delete an existing SDV rule, you first have to select that SDV rule. Please see the section titled “Selecting an Existing SDV Rule” for a detailed discussion of the process of selecting an existing SDV rule in order to view, edit or delete that rule.

After selecting an SDV rule, if you are authorized to delete that rule a delete icon/link will be visible at the top of the form.

As long as you have the required authorization, you are never prevented from deleting an existing soil property SDV rule.

Soil Property SDV Rule Data Entry Guidelines

The fields associated with a soil property SDV rule are distributed among five different tabs: “General”, “Constraints / Qualifiers”, “Processing Options”, “Folder / Land Uses” and “Map Legend”.

When adding a new soil property SDV rule, a default value has been assigned to every field for which it is possible to do so. This default value will be the most appropriate value in the majority of cases. Therefore, you shouldn't change a default value unless you are sure that you understand the reason for doing so. The data entry guidelines for a field will discuss reasons for changing a default value.

Once you start adding or editing an SDV rule, the SDV Rule Manager application will not force you to save or cancel any pending edits prior to navigating out of the add/edit form. If you navigate out of adding or editing an SDV rule before saving all pending changes, all pending changes will be lost. If you need to view some other SDV related object while in the midst of editing some other SDV related object, you need to start a second SDV Rule Manager Browser session in order to view that related SDV object.

General Tab

Most of the fields on the General Tab are used to identify, define and record the vintage of the corresponding SDV rule. For a soil property SDV rule, the corresponding table, column and logical data type are identified.

General		Constraints / Qualifiers	Processing Options	Folder / Land Uses	Map Legend
Property:	chorizon.dbthirdbar_r				
Logical Data Type:	Float				
Rule Name:	Bulk Density one third bar				
Rule Description:	<p>Bulk density 1/3 bar is the oven-dried weight of the less than 2 mm soil material per unit volume of soil at water tension of 1/3 bar, expressed in grams per cubic centimeter. Bulk density data are used to compute linear extensibility, shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.</p> <p>For each soil horizon or layer in the underlying database, this attribute is actually recorded as three separate values. A low value and a high value indicate the range of this attribute for the corresponding component. A "representative" value indicates the expected value of this</p>				
Default Result Column Name:	Db3rdbar				
Available in Basic Mode?	<input type="checkbox"/>				
Ready to Distribute?	<input checked="" type="checkbox"/>				
Last Updated:	1/30/2006 8:08:05 AM				

General Tab for soil property SDV rule “Bulk Density one third bar”.

Property

This field displays the table and column (as table.column) to which this soil property SDV rule corresponds. This field cannot be edited.

Logical Data Type

This field displays the logical data type of the corresponding table column. This field is displayed because its value influences a number of other default values. Only attributes with a logical data type of “Float”, “Integer”, “Choice”, “String” or “Narrative Text” can be aggregated. Attributes with a logical data type of “Boolean” or “Date/Time” cannot be aggregated at this time. This field cannot be edited.

Logical data type “Float” includes both single precision (4 byte) and double precision (8 byte) floating point values.

Logical data type “Integer” includes both short (2 byte) and long (4 byte) integer values.

Logical data type “Choice” implies that the allowable values of the corresponding soil property are restricted to a fixed domain, e.g. flooding frequency class. When the logical data type is “Choice”, an appended string indicates whether or not the corresponding domain is considered to be logically ordered. Whether or not the corresponding domain is logically ordered affects the default values for “Tie-Break Rule” and “Tie-Break Rule Overridable?”.

Logical data type “String” corresponds to fixed and variable length character strings containing 255 or fewer characters.

Logical data type “Narrative Text” corresponds to variable length narrative text that may contain embedded paragraph breaks.

Rule Name

This is the name of the corresponding SDV rule. Look at other national SDV rule names to get a feel for the conventions that are used for SDV rule names. The following characters are not permitted in an SDV rule Name:

∨:*?"<>|. &

This field is required. No two SDV rules, regardless of type, may have the same name.

Rule Description

This is a narrative description of the corresponding SDV rule. Look at other national SDV rule descriptions to get a feel for the conventions that are used for SDV rule descriptions. This field is required.

Default Result Column Name

When a thematic map is generated for the corresponding SDV rule, this will be the default column name into which the corresponding map unit rating will be stored. A Soil Data Viewer user can change this default name at runtime. Look at other result column names to get a feel for the conventions that are used for result column names.* A result column name can include no more than ten characters, must begin with a letter and contain only letters, digits and underscores. This field is required.

*The formatting convention used for result column names is referred to as “CamelCase”, i.e. the first letter of a word or substring that represents a word is capitalized, and there are no spaces between words. Also, if you are creating an SDV rule for a state version of an existing national soil interpretation, I suggest using the same default result column name as that state soil interpretation’s national counterpart.

Available in Basic Mode?

This field indicates whether or not the corresponding SDV rule should be visible when the Client Soil Data Viewer application is in “Basic Mode”. Our current convention is that intrinsic soil property SDV rules should not be available in Basic Mode, but non-

intrinsic soil property SDV rules should be. For a discussion of the difference between intrinsic and non-intrinsic soil properties, please see the section titled “Soil Attributes, Client Soil Data Viewer and Web Soil Survey”.

For ALL soil property SDV rules, this field is not set (not checked) by default. Therefore you are responsible for setting this field for a non-intrinsic soil property.

The Client Soil Data Viewer application is always either in Basic Mode or Advanced Mode. The intention is that the attributes available in Basic Mode should not require any runtime parameters for which no default value is defined, with the exception of any required data selection options, i.e. primary/secondary constraint selections.

Ready to Distribute?

Ready to Distribute?

This field indicates whether or not this SDV rule is ready to be included in exports from the Soil Data Mart. This field should never be set (checked) until the corresponding SDV rule has actually been tested using the Client Soil Data Viewer application. More on this in a bit. For new SDV rules, this field is not set (not checked) by default.

This field cannot be set and saved unless:

1. All required fields are populated with valid values.
2. This SDV rule is associated with a folder.
3. Any corresponding custom map legend passes all custom map legend validations.

If any of these validations fail, you will be required to either fix the problem, or reset (uncheck) “Ready to Distribute?”, before you can save any edits.

Determining if an SDV Rule is Ready to Distribute

An SDV rule should not be distributed until it has actually been tested using the Client Soil Data Viewer application. This gives you a chance to see how that SDV rule is going to appear to an end user. You also need to verify that a thematic map can be generated, and that the thematic map and corresponding map legend look as you expect them to look.

How can you test a new SDV rule if that SDV rule can't be exported from the Soil Data Mart until “Ready to Distribute?” has been set? To do so, you have to create a SSURGO export from either NASIS or the Staging Server. NASIS and Staging Server SSURGO

exports will export an SDV rule, regardless of the setting of “Ready to Distribute?”, but keep in mind that a soil interpretation SDV rule still won’t be included in a SSURGO export from NASIS or the Staging Server unless the corresponding soil data includes the soil interpretation in question.

Keep in mind that in order to generate a thematic map, both tabular and spatial data are required. A SSURGO export from NASIS never includes spatial data, and a SSURGO export from the Staging Server only includes spatial data when the corresponding spatial data is currently loaded into the Staging Server database. If you know that spatial data for the survey area in question in the Soil Data Mart is still compatible with tabular data exported from NASIS, you could obtain the spatial data for a survey area from a Soil Data Mart export.

Last Updated

This is the date and time when the corresponding SDV rule was last saved to the Soil Data Mart database. This value controls when an SDV rule in a SSURGO template database is updated. When importing tabular data, an existing SDV rule in a SSURGO template database will be updated only when the same SDV rule (“same” being based on the SDV rule’s internal key value) in the tabular data being imported has a more recent “Last Updated” date. This field cannot be edited.

Constraints / Qualifiers Tab

In some cases, specifying a table and column isn’t sufficient to completely identify a specific soil property. The Constraints / Qualifiers Tab includes all additional information that is necessary to completely identify the soil property in question. The information on this tab is used in the construction of the query that the Soil Data Viewer application uses to retrieve data for the corresponding soil property, as input to the aggregation process.

The screenshot shows a software interface with five tabs: General, Constraints / Qualifiers, Processing Options, Folder / Land Uses, and Map Legend. The 'Constraints / Qualifiers' tab is active. It contains the following fields:

Primary Constraint Column:	cropname
Primary Constraint Label:	Crop
Secondary Constraint Column:	yldunits
Secondary Constraint Label:	Yield Units

Below these fields is a large text area labeled 'SQL WHERE Clause:' which is currently empty.

Constraints / Qualifiers Tab for soil property SDV rule “Potential Irrigated Crop Yield (Component)”.

Primary Constraint Column/Secondary Constraint Column

In some cases, specifying a table and column isn't sufficient to completely identify a specific soil property. For some tables, more than one column in that table is necessary to completely identify a specific soil property. Take the component crop yield table for example. The value in column cocropyld.irryield_r (potential irrigated crop yield) isn't meaningful unless we also know the corresponding crop and yield units. Another example is the component restrictions table. The value in column corestrictions.resdept_r (depth to restriction) isn't meaningful unless we know what kind of restriction we are talking about.

Any additional columns in a table necessary to completely identify a soil property, beyond the column selected for aggregation, must be specified in “Primary Constraint Column” and possibly “Secondary Constraint Column”. At the current time, if more than two additional columns are necessary to completely identify a soil property, you're out of luck.

If only one additional column is necessary to completely identify a soil property, that column must be selected as the “Primary Constraint Column”. If two additional columns are necessary to completely identify a soil property, you will have to decide which one is specified as the “Primary Constraint Column” and which is specified as the “Secondary Constraint Column”. This decision is not arbitrary.

At runtime, a Soil Data Viewer user will have to make a selection for each constraint column that is defined. The choice list for the secondary constraint column will be

constrained by whatever value a user selects as the primary constraint value. In most cases where two constraint columns are needed, I suspect that it will be relatively clear which column should be specified as the primary constraint column.

Again, take potential irrigated crop yield for example. It obviously makes more sense to select a crop before selecting the corresponding yield units, therefore the crop name column should be the primary constraint column.

At the time this was written, other than the crop yield soil properties, the only other soil properties for which both a primary and secondary constraint columns were defined were “Forest Productivity (ft³ per ac per yr)” and “Forest Productivity (Tree Site Index)”. In this case the primary constraint column is the tree name, and the secondary constraint column is that tree’s site index base.

The choice list for selecting a constraint column includes all valid columns in the table for the corresponding soil property, excluding the column being aggregated and the primary constraint column (when selecting a secondary constraint column). A valid column is any column whose corresponding logical data type is either “Float”, “Integer”, “Choice”, “String” or “Narrative Text”, whose corresponding name does not end in the substring “key”. These are the same constraints as to which columns may be selected for aggregation. The columns in the choice list for selecting a constraint are sorted in ascending order on column physical name.

Primary Constraint Label/Secondary Constraint Label

When a constraint column is specified, a Soil Data Viewer user will have to make a selection from a dropdown list for each constraint column that is specified. The interface needs to provide some label for that dropdown control to indicate what it being selected. So for the crop yield attributes, the label for the primary constraint is “Crop”, and the label for the secondary constraint is “Yield Units”. This label should not include any separators, like a colon following the label.

For each constraint column that is defined, a corresponding label is required. A constraint label must include 20 or fewer characters.

Month Range

The screenshot displays the 'Constraints / Qualifiers' tab of the Soil Data Viewer Rule Manager. It features several input fields and a text area:

- Primary Constraint Column:** A dropdown menu showing 'No Primary Constraint'.
- Primary Constraint Label:** An empty text input field.
- Secondary Constraint Column:** A dropdown menu showing 'No Secondary Constraint'.
- Secondary Constraint Label:** An empty text input field.
- Month Range:** Two dropdown menus with 'January' and 'December' selected, separated by a hyphen.
- Month Range Overridable?:** A checked checkbox.
- SQL WHERE Clause:** A text area containing the SQL snippet `soimoiststat='wet'`.

Constraints / Qualifiers Tab for soil property SDV rule “Depth to Water Table”.

This field is displayed only when the corresponding soil property is at the component month level or below.

Some soil properties are recorded by month. This includes attributes in table “comonth” and attributes in any table in the table hierarchy below “comonth”. For any such attribute, a default month range is required. The order of the two selected months matters. January to December includes twelve months. December to January includes only two months.

Month Range Overridable?

This field is displayed only when the corresponding soil property is at the component month level or below.

When this option is set (checked), a Soil Data Viewer user can change the default month range at runtime. Otherwise they cannot. The name of the corresponding SDV rule should not include the default month range unless this option is not set (not checked).

For attributes that are recorded by month, this option is always set (checked) by default.

Depth Qualifier

The screenshot shows the 'Constraints / Qualifiers' tab in the Soil Data Viewer Rule Manager. The interface includes the following elements:

- Primary Constraint Column:** A dropdown menu with 'No Primary Constraint' selected.
- Primary Constraint Label:** An empty text input field.
- Secondary Constraint Column:** A dropdown menu with 'No Secondary Constraint' selected.
- Secondary Constraint Label:** An empty text input field.
- Depth Qualifier:** A dropdown menu with 'Depth Range' selected.
- Depth Qualifier Overridable?** A checkbox that is checked.
- SQL WHERE Clause:** A large, empty text area for entering SQL queries.

Constraints / Qualifiers Tab for soil property SDV rule “Bulk Density one third bar”.

This field is displayed only when the corresponding soil property is at the horizon level or below.

Attributes of a soil horizon or layer includes attributes in table “chorizon” and attributes in any table in the table hierarchy below “chorizon”. For any such attribute, a default depth qualifier is required. Any of the following depth qualifiers may be selected as the default depth qualifier.

1. **Depth Range** – A Soil Data Viewer user is required to provide a top and bottom depth at runtime. Those portions of all layers that are coincident with the specified depth range are considered during the aggregation process. A weighted average value for the portion of all layers that are coincident with the specified depth range is returned for the corresponding component. The weighing factor is the layer portion’s percent of the total depth range.
2. **Surface Layer** – Only the surface layer is considered during the aggregation process. If there is only one surface layer, the attribute value for that surface layer is returned for the corresponding component. If there is more than one surface layer, which I’m not sure is ever legitimate, depending on the corresponding tie-break rule, either the minimum or maximum attribute value among all surface layers is returned for the corresponding component. A surface layer is any layer where the corresponding representative depth to top is zero (hzdept_r = 0).

3. All Layers – All layers are considered during the aggregation process. A weighted average value for all layers is returned for the corresponding component. The weighing factor is the layer's percent of the total depth range.

For all numeric horizon level attributes, depth qualifier is set to “Depth Range” by default. For all non-numeric horizon level attributes, depth qualifier is set to “Surface Layer” by default.

Depth Qualifier Overridable?

This field is displayed only when the corresponding soil property is at the horizon level or below.

When this option is set (checked), a Soil Data Viewer user can change the default depth qualifier at runtime. Otherwise they cannot. The name of the corresponding SDV rule should not include any reference to the default depth qualifier unless this option is not set (not checked).

For all numeric horizon level attributes, this option is set (checked) by default. For all non-numeric horizon level attributes, this option is not set (not checked) by default.

SQL Where Clause

In some cases, even the available parameterized constraints and qualifiers may not be sufficient to fully qualify/identify the soil property in question. The purpose of this field is to provide for any additional constraints that may need to be specified, beyond those parameterized optional constraints that are already provided.

Anything you enter in this field must be valid Microsoft SQL Server SQL. The only columns that can be referenced are columns in the same table as the corresponding soil property. What is entered here will be AND'ed with any other constraints that have been defined. Any clause entered here should not include the keyword “WHERE”. Also, you do not need to enter the “AND” keyword to have this clause AND'ed with any other constraints that have been defined. If you enter a complex clause that includes AND's or OR's, the entire clause you enter should be parenthesized.

At the time this was written, only soil property “Depth to Water Table” had a corresponding where clause: `soimoiststat = 'wet'`.

When you save an SDV rule that has a corresponding where clause, what validation is available is performed, but because the query that includes this clause is not actually executed against data, not all potential problems will necessarily be found. This is another reason why you need to actually test a new SDV rule against real data before setting “Ready to Distribute?” / “Ready to Review?”.

Processing Options Tab

There are a number of parameters that affect the outcome of the aggregation process. The Processing Options Tab allows the SDV rule designer to provide a default value for each of those parameters, and for some parameters, the SDV rule designer can indicate whether or not a parameter's default value can be changed at runtime.

General		Constraints / Qualifiers		Processing Options		Folder / Land Uses		Map Legend	
Default Aggregation Method:		Dominant Component							
Tie-break Rule:		<input type="radio"/> Lower Value		<input checked="" type="radio"/> Higher Value					
Tie-break Low Label:									
Tie-break High Label:									
Tie-break Rule Overridable?		<input checked="" type="checkbox"/>							
Interpret Nulls as Zero?		<input checked="" type="checkbox"/>							
Interpret Nulls as Zero Overridable?		<input checked="" type="checkbox"/>							

Processing Options Tab for soil property SDV Rule “Calcium Carbonate (CaCO₃)”.

Default Aggregation Method

Aggregation method determines how a single rating value for a map unit as a whole is derived from a set of individual map unit component values.

The default aggregation method for a soil property is determined as follows.

If the attribute in question is an attribute of a map unit, as opposed to being an attribute of a map unit component, set the default aggregation method to “No Aggregation Necessary”, which happens to be the only allowable aggregation method in this case.

Otherwise if the attribute in question is component.hydrating, set the default aggregation method to “Absence/Presence”, which happens to be the only allowable aggregation method in this case.

Otherwise if the corresponding logical data type is either “Float” or “Integer”, set the default aggregation method to “Dominant Component”. Other allowable aggregation methods include “Dominant Condition”, “Weighted Average” and “All Components”.

Otherwise set the default aggregation method to “Dominant Condition”. Other allowable aggregation methods include “Dominant Component” and “All Components”.

Our current convention is to never change the default aggregation method as determined above. This default is arguably the most appropriate aggregation method, in general. Keep in mind that a Soil Data Viewer user is ALWAYS permitted to select any valid aggregation method at runtime.

For a more complete discussion of aggregation methods and usage conventions, please see the section titled “Aggregation Methods – The Details”.

Tie-Break Rule

This field allows you to indicate whether the lower or higher value should be returned in the face of multiple candidate values, or in the event of a percent composition tie.

The default tie-break rule for a soil property is determined as follows.

If the corresponding logical data type is either “Float” or “Integer”, or the corresponding logical data type is “Choice” and the corresponding domain is logically ordered, set the default tie-break rule to “Higher”.

Otherwise set the default tie-break rule to “Lower”.

In other words, for numeric soil properties and soil properties associated with a logically ordered domain, the default tie-break rule is “Higher”. For non-numeric soil properties and soil properties associated with a domain that is not logically ordered, the default tie break rule is “Lower”.

Our current convention is to never change the default tie-break as determined above, for non-numeric soil properties and soil properties associated with a domain that is not logically ordered.

For numeric soil properties and soil properties associated with a logically ordered domain, the default tie-break rule as determined above may be changed in cases where there is some rationale for doing so.

For example, at the time this was written, for numeric soil properties and soil properties associated with a logically ordered domain, the only time that the default tie break rule as determined above was overridden, was for the following soil properties:

Depth to Soil Restrictive Layer
Depth to Water Table
T Factor

For these soil properties, returning the lower value in the case of multiple candidate values or a percent composition tie represents the more conservative result for most potential applications of that soil property. In general, when possible, we want the aggregation process to return the more conservative, or pessimistic, result.

Tie-Break Low Label

In the Soil Data Viewer interface, the default label for the option specifying that the lower value should be returned in the face of multiple candidate values or in the event of a percent composition tie is “Lower”. There are some cases, like permeability or flooding frequency, where a different label (Slower, Less Frequent) is more appropriate. This field allows you to override the default tie-break low label.

Obviously, this field is not required, but if a tie-break low label is provided, a tie-break high label must also be provided.

Tie-Break High Label

In the Soil Data Viewer interface, the default label for the option specifying that the higher value should be returned in the face of multiple candidate values or in the event of a percent composition tie is “Higher”. There are some cases, like permeability or flooding frequency, where a different label (Faster, More Frequent) is more appropriate. This field allows you to override the default tie-break high label.

Obviously, this field is not required, but if a tie-break high label is provided, a tie-break low label must also be provided.

Tie-Break Rule Overridable?

When this option is set (checked), a Soil Data Viewer user can change the default setting of “Tie-Break Rule” at runtime.

For numeric soil properties and soil properties associated with a logically ordered domain, this option is set (checked) by default. For logically ordered soil property

values, we see no reason to prevent a Soil Data Viewer user from being able to change the default tie-break rule at runtime.

For non-numeric soil properties and soil properties associated with a domain that is not logically ordered, this option is not set (not checked) by default. For soil property values that are not logically ordered, we see no reason to allow a Soil Data Viewer user to be able to change the default tie-break rule at runtime, since there is little or no rationale for preferring the higher ASCII value over the lower ASCII value.

Interpret Nulls as Zero?

This field is displayed only for numeric soil properties.

For some soil properties, a null or missing value can reasonably be interpreted as being equivalent to zero. Examples include calcium carbonate, electrical conductivity, gypsum, forest productivity for a given tree, potential crop yield for a given crop, range production, etc.

For numeric soil properties of a map unit component, one of the allowable aggregation methods is “Weighted Average. A component whose corresponding attribute value is null or missing is excluded from consideration for a weighted average aggregation, which means that component’s corresponding percent composition isn’t factored into the weighted average value for all components.

For example, say a map unit has two components. One component at 50% composition records no corresponding potential irrigated corn yield. The other component, also at 50% composition records a potential irrigated corn yield of 100 bu/ac.

If a weighted average aggregation is performed for potential irrigated corn yield, and null and missing values are not converted to zero, the potential irrigated corn yield rating for the map unit as a whole would be 100 bu/ac ($50\% / 50\% * 100$). If the same aggregation is performed where null and missing values are converted to zero, the potential irrigated corn yield rating for the map unit as a whole would be 50 bu/ac ($(50\% / 100\% * 100) + (50\% / 100\% * 0) = 50$).

Setting this option (checking this option) converts null or missing values for a component to zero, *so long as at least one component for the same map unit has a non-null value for the attribute being aggregated*. In other words, if the value being aggregated is null or missing for all components of a map unit, the overall map unit rating for that attribute will be null, regardless of the setting of this field.

This option, when set, conditionally (see preceding paragraph) converts null and missing values to zero, regardless of the corresponding aggregation method.

For a soil property for which a null or missing value can reasonably be interpreted as zero, we suggest setting (checking) this option. By default, for any soil property, this option is not set (not checked). The person creating an SDV rule is responsible for determining when this option should be set.

Interpret Nulls as Zero Overridable?

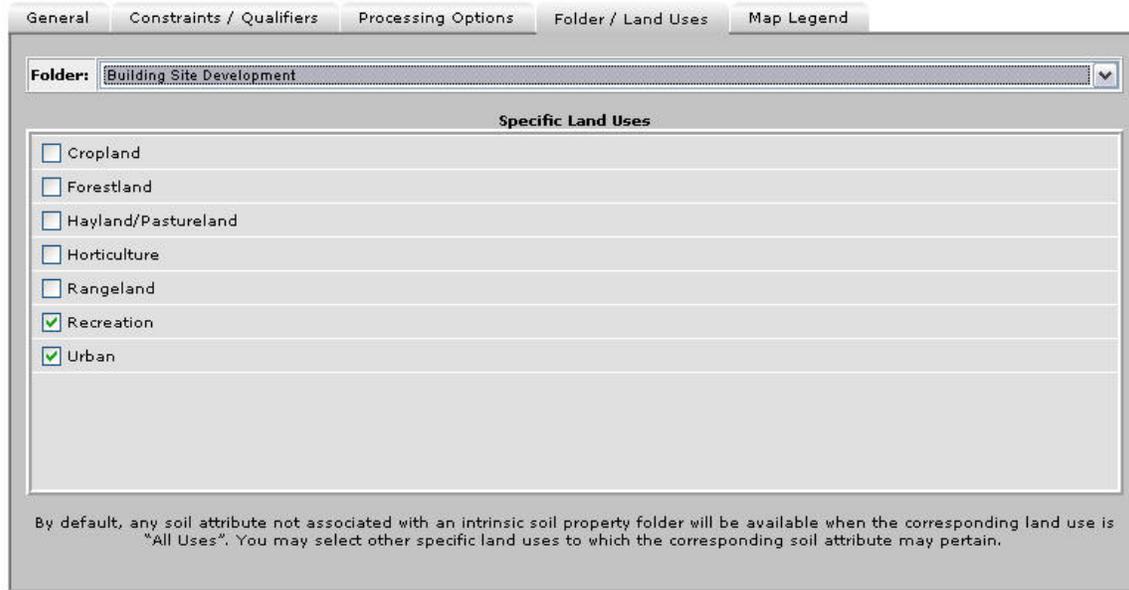
This field is displayed only for numeric soil properties.

When this option is set (checked), a Soil Data Viewer user can change the default setting of “Interpret Nulls as Zero” at runtime.

Our current convention is that when “Interpret Nulls as Zero?” is set, this option should also be set (checked), and when “Interpret Nulls as Zero?” is not set (not checked), this option should not be set (not checked). By default, for any soil property, this option is not set (not checked).

Folder / Land Uses Tab

In order to be available to end users, an SDV rule *must* be associated with a folder. SDV rules associated with a non-intrinsic soil property folder *may* also be associated with one or more specific land uses. This controls which SDV rules are available in Web Soil Survey when the Web Soil Survey user has selected a specific land use. SDV rules not associated with any specific land are still available to a Web Soil Survey user when they have selected “All Uses”. Folder and land use associations are established on the Folder / Land Uses tab.



Folder / Land Uses Tab for soil property SDV Rule “Corrosion Concrete”.

Folder

This field allows you to associate an SDV rule with a folder. An SDV rule must be associated with a folder in order to be available in Client Soil Data Viewer and Web Soil Survey. The folders managed by the Soil Data Viewer Rule Manager application are shared by Client Soil Data Viewer and Web Soil Survey.

An SDV rule may be associated with one and only one folder. The dropdown list of folders available for a soil property SDV rule includes all folders. When a folder is an intrinsic soil property folder, the string “(intrinsic soil property folder)” will be appended to the folder name. Obviously only intrinsic soil properties should be associated with an intrinsic soil property folder. Please see the section titled “Soil Attributes, Client Soil Data Viewer and Web Soil Survey” for a discussion of the difference between intrinsic and non-intrinsic soil properties.

As long as “Ready to Distribute?” or ”Ready to Review?” is not checked, an SDV rule can be saved without having to be associated with a folder.

When making folder assignments, it is helpful to have some idea about which SDV rules are already associated with which folders. But if you select and view a folder in the midst of adding or editing an SDV rule, without first saving your work, all pending changes will be lost. If you want to see which SDV rules are currently associated with a folder, while in the midst of adding or editing an existing SDV rule, you need to start a second SDV Rule Manager Browser session to select and view folders.

Specific Land Uses

The Web Soil Survey application allows non-intrinsic soil property SDV rules to be associated with one or more specific land uses. These associations are used to filter which SDV rules are available for the current land use context, within Web Soil Survey. Web Soil Survey is always either in a specific land use context, like “Rangeland”, or in the land use context known as “All Uses”.

Intrinsic soil properties are considered to be land use independent, so an SDV rule for an intrinsic soil property cannot be associated with any specific land use, which in effect means that an intrinsic soil property SDV rule will always be available, regardless of the current land use context in Web Soil Survey.

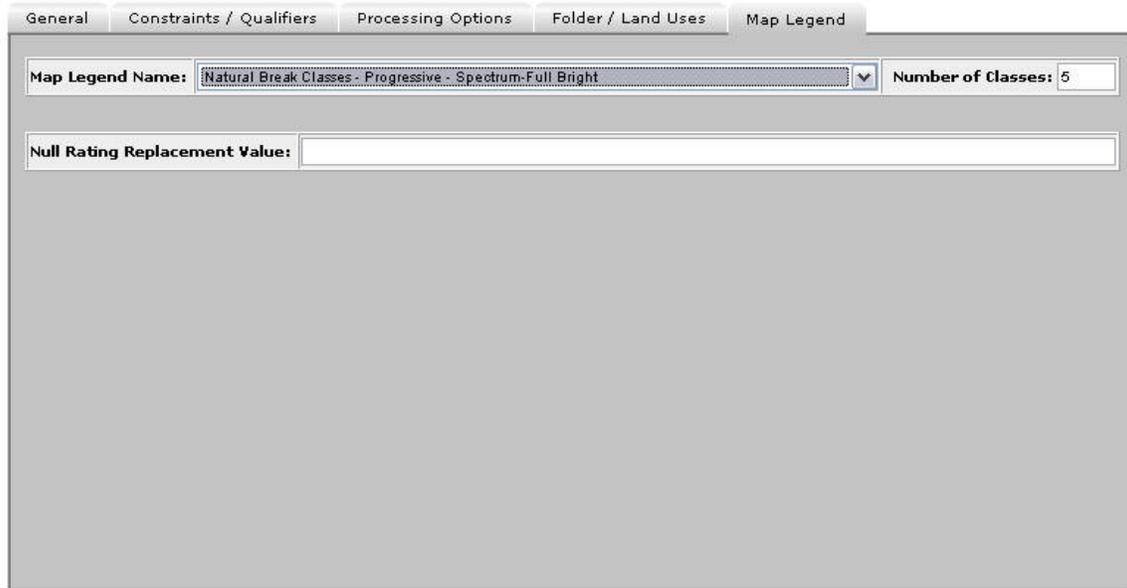
Non-intrinsic soil property SDV rules can be associated with zero, one or more specific land uses. A non-intrinsic soil property SDV rule that is not associated with any specific land use will still be available when the corresponding land use is “All Uses”. But when the current land use is a specific land use, “Rangeland” for example, only those non-intrinsic soil property SDV rules explicitly associated with land use “Rangeland” will be available.

For an intrinsic soil property SDV rule associated with an intrinsic soil property folder, no land uses will be listed. For a non-intrinsic soil property SDV rule associated with a folder that is not an intrinsic soil property folder, all specific land uses (all land uses except “All Uses”) will be listed. To associate an intrinsic soil property SDV rule with a specific land use, the box to the left of that land use name should be checked. A non-intrinsic soil property SDV rule associated with a folder that is not an intrinsic soil property folder can be associated with zero, one or more specific land uses.

So why would you ever want an SDV rule to be available for “All Uses” but not for any specific land use? There may be interpretive soil attributes that really don’t pertain to any existing specific land use. By making such an attribute available for land use “All Uses”, we ensure that the corresponding SDV rule is at least available in one land use context.

Map Legend Tab

The Map Legend Tab includes information needed to construct a thematic map as well as that map’s corresponding map legend, for the corresponding SDV rule. The information on this tab is ultimately passed to ArcMap’s map generation process.



Map Legend Tab for soil property SDV rule “Calcium Carbonate (CaCO₃)”.

Map Legend Name

This field is used to specify the name of the map legend to be used when creating thematic maps for the corresponding SDV rule. The map legend name dropdown choice list will always contain only those map legends that are valid for the current context. A map legend name is always required.

A default map legend name will always be provided. In most cases, you should accept the default map legend name that is provided. For a discussion of considerations in selecting a map legend name, please see the section titled “Map Legends and Custom Map Legends – The Details”.

Number of Classes

This field is displayed only when the corresponding map legend is a “Natural Break Classes” type of map legend.

The value of this field specifies the number of map legend classes that should appear in the map legend of any thematic map for the corresponding soil property. For a “Natural Break Classes” map legend, a map legend class corresponds to a range of possible rating values.

For a “Natural Break Classes” type of map legend, specifying the number of map legend classes is always required. The default value for this field is 5. This default value shouldn’t be changed without a reason for doing so.

Custom Map Legend Grid

Map Legend Name: Custom Classes - Progressive - Spectrum-Full Bright

Seq	Lower Rating Value	Upper Rating Value	Class Name
1	0	0.01	Very Low (0.0 - 0.01)
2	0.01	0.1	Low (0.01 - 0.1)
3	0.1	1	Moderately Low (0.1 - 1)
4	1	10	Moderately High (1 - 10)
5	10	100	High (10 - 100)
6	100	705	Very High (100 - 705)

Add Row

Click on a row to select it. Double-click on a row to change it.
The delete key deletes the selected row.

Null Rating Replacement Value:

Map Legend Tab for soil property SDV rule “Saturated Hydraulic Conductivity (Ksat), Standard Classes”.

A custom map legend grid is displayed only when the corresponding SDV rule references a custom map legend type (Custom Classes, Custom Unique Values, Stoplight Interpretation).

When an SDV rule references a custom map legend type, in addition to the attributes associated with the corresponding “map legend” (map legend name, map legend type, color ramp type, color ramp name), a number of additional custom map legend attributes must be provided. Those custom map legend attributes are associated with the corresponding SDV rule, not with the corresponding “map legend”. A custom map legend allows a user to explicitly specify map legend class names and colors, and to group rating values into the same map legend class.

For a discussion of the data entry rules for custom map legends, please see the section titled “Map Legends and Custom Map Legends – The Details”.

Null Rating Replacement Value

Any value entered for this field will be substituted for a null map unit rating for the corresponding soil property, for rating data submitted to the map generation process, but not for rating data submitted for report formatting.

The purpose of this field is best understood with an example. For soil properties “Depth to Water Table” and “Depth to Soil Restrictive Layer”, the Soil Survey Division didn’t like the fact that for a map unit where no water table or restriction exists, the corresponding map unit was originally classified as “Null or not rated”. For such a map unit, the Soil Survey Division wanted the thematic map to reflect that no water table or restriction was found within a certain depth.

So we added the concept of a “null rating replacement value”. So for “Depth to Water Table” and “Depth to Soil Restrictive Layer”, the null rating replacement value is set to 201. Therefore, a map unit with no water table or no restrictive layer is now thrown into the map legend class “> 200”, rather than the map legend class “Null or not rated”. In the corresponding aggregation report, the rating value will still be Null (blank), since it didn’t seem appropriate for a bunch of bogus values to appear in a report.

Other examples are the soil properties “Flooding Frequency Class” and “Ponding Frequency Class”. For these attributes, a null rating value really corresponds to “no flooding” or “no ponding”. Therefore the null rating replacement value for these soil properties was set to “None”, which is one of the existing domain choices for “Flooding Frequency Class” and “Ponding Frequency Class”.

Note that when the corresponding soil property has some sort of custom map legend, setting a null rating replacement value is only effective when the null rating replacement value is a value that will cause a map unit with an original null rating to fall into the desired map legend class.

Any null rating replacement value must conform to the following constraints:

1. It must represent a valid instance of the same data type as the corresponding soil property that is being aggregated.
2. It must satisfy any range or domain constraints that are defined for the corresponding soil property that is being aggregated.

The SDV Rule Manager application will make these checks for you and inform you when a value you have entered for “null rating replacement value” violates any of these constraints.

Selecting a Soil Interpretation

To add a new SDV rule for a soil interpretation, you first have to select the soil interpretation for which you wish to add a corresponding SDV rule. This can be done by selecting “Add Interpretation Rule” or “Find Interpretations without Rules”.

Add Interpretation Rule

Add Interpretation Rule

This search returns interpretations that meet your specified criteria, plus the following:

1. A rule has not already been created for that interpretation.
2. State and local naming standards are met if it is not owned by NASIS site “NSSC Pangaea”.
3. The interpretation is marked within NASIS as being a “primary interpretation”.
4. The interpretation is marked within NASIS as being “ready to use”.

Interpretation:	<input type="text"/>	Wildcard characters may be entered in the Interpretation field. See the Help page for more information.
NASIS Site:	<input type="text" value="NSSC Pangaea"/>	
<input type="button" value="Find Interpretations"/>		

“Add Interpretation Rule” Form

“Add Interpretation Rule” searches NASIS for soil interpretations for which no corresponding SDV rule currently exists. This option allows you to search by NASIS site and/or by a substring in the soil interpretation name. You should use this option when you already know the soil interpretation for which you wish to add a corresponding SDV rule.

This option returns soil interpretations in NASIS where:

1. An SDV rule does not already exist for that soil interpretation.
2. Interpretation naming standards are met if the soil interpretation is not owned by NASIS site “NSSC Pangaea”.
3. The soil interpretation is marked as a “Primary Interpretation”.
4. The soil interpretation is marked as “Ready to Use”.

Find Interpretations without Rules

Find Interpretations without Rules

Option "NASIS" finds "primary" interpretations in the NASIS database without a corresponding rule.

Option "Soil Data Mart" scans interpretation results in the Soil Data Mart database for which:

1. The corresponding interpretation in NASIS has no corresponding rule. (Column "NASIS Site" in the results grid will be populated.)
2. There is no longer a corresponding interpretation in NASIS. (Column "NASIS Site" in the results grid will not be populated.)

Find the interpretations without rules, in: NASIS or Soil Data Mart

Interpretation:	<input type="text"/>
NASIS Site:	NSSC Pangaea <input type="button" value="v"/>

Wildcard characters may be entered in the Interpretation field. See the [Help page](#) for more information.

“Find Interpretations without Rules” Form

Option “NASIS” returns “primary” soil interpretations in NASIS, for the selected NASIS site, that have no corresponding SDV rule.

Option “Soil Data Mart” scans the Soil Data Mart database for soil interpretation results for the selected state or soil survey area, for which:

1. The corresponding soil interpretation in NASIS has no corresponding SDV rule (NASIS Site in the results grid will be populated).
2. There is no longer a corresponding soil interpretation in NASIS (NASIS Site in the results grid will be blank).

Option “Soil Data Mart” returns soil interpretations regardless of the setting of their Primary Interpretation flag in NASIS.

Both of these options return soil interpretations, if any, which match all specified criteria, in a scrollable grid. The records in this grid are sorted in ascending order by soil interpretation name.

Interpretations found: 62

If the first column in the results contains a plus sign, click it to add a rule for that interpretation.
 If it contains one or more numbers, click those numbers to find out why you can't add a rule.

	Interpretation	Type	NASIS Site
5	AGR - Air Quality; PM10 Potential (TX)	limitation	
5	AGR - Air Quality; PM2_5 Potential (TX)	limitation	
3	AGR - Highly Erodible Lands (TX)	limitation	MLRA09_Office
5	AGR - Mulch Till (TX)	suitability	
+	AGR - No Till, Tile Drained (TX)	suitability	MLRA09_Office
3	AGR - Prime Farmland (TX)	suitability	MLRA09_Office
3	AGR - Rangeland Grass/Herbaceous Productivity Index (TX)	limitation	MLRA09_Office
+	AGR - Ridge Till (TX)	suitability	MLRA09_Office
5	AWM - Irrigation Disposal of Wastewater	limitation	
3	AWM - Phosphorus Management revised (TX)	limitation	MLRA09_Office
5	BLM - Chaining	suitability	
5	BLM - Colorado Plateau-Rangeland Seeding	suitability	

Selected Soil Interpretations Grid

This grid includes the following columns:

1. Plus sign or Reason(s)*
2. Soil Interpretation Name
3. Soil Interpretation Type or “Rule Design” (Limitation, Suitability or Class)
4. NASIS Site Name (the name of the NASIS site that owns the corresponding soil interpretation). This column will be blank if the corresponding interpretation no longer exists in NASIS.

*If the first column contains a plus sign, you can initiate the addition of a new SDV rule for the corresponding soil interpretation by clicking the plus sign in that row. If the first column doesn't contain a plus sign, it will contain a comma delimited list of one or more numbers. The absence of a plus sign indicates that you cannot create a new SDV rule for this soil interpretation at this time. Click on an individual number to see the reason associated with that number.

Here are the reasons you may not be able to add an SDV rule for a selected soil interpretation:

1. You are not currently authorized to add a new SDV rule for this soil interpretation's corresponding NASIS site.
2. This soil interpretation doesn't conform to the nomenclature standard for non-national soil interpretations.
3. In NASIS, the Ready to Use flag for this soil interpretation is not set to “Yes”.
4. In NASIS, the Primary Interpretation flag for this soil interpretation is not set to “Yes”.

5. This soil interpretation no longer exists in NASIS.

NASIS allows the creation of two different soil interpretations whose names differ only by case. Soil Data Viewer Rule Manager will not allow you to create SDV rules for two soil interpretations whose names differ only by case.

If no SDV rule currently exists for either soil interpretation whose names differ only by case, both soil interpretations will be returned when searching for soil interpretations with no corresponding SDV rule. At that point you could add an SDV rule for either one of those two soil interpretations whose names differ only by case. But once you've added an SDV rule for one of those interpretations, you will not then be able to add an SDV rule for the other, because at this point, the SDV Rule Manager application thinks that an SDV rule already exists for that soil interpretation.

Managing Soil Interpretation SDV rules

Any authorized SDV Rule Manager user can select and view any existing soil interpretation SDV rule.

Adding a New Soil Interpretation SDV Rule

Any authorized SDV Rule Manager user who is a member of group “Soil Data Viewer” for a particular NASIS site can potentially create a soil interpretation SDV rule for any soil interpretation owned by that NASIS site. See a little further below for reasons that prevent the creation of a SDV rule for a particular soil interpretation.

Note that for any particular soil interpretation, one and only one SDV rule may be defined.

In order to add a new soil interpretation SDV rule, you must first select the soil interpretation for which you wish to add the corresponding SDV rule. Please see the section titled “Selecting a Soil Interpretation” for a detailed discussion of the process of selecting a soil interpretation for which you wish to add a corresponding SDV rule.

To add an SDV rule for a selected soil interpretation, click the plus sign next to the soil interpretation for which you wish to add the corresponding SDV rule. When you click the plus sign in the row for a particular soil interpretation, information about that interpretation is retrieved from the NASIS database. This includes extracting the existing rating classes associated with that interpretation. A number of validations are performed at this point, and if any of the following conditions are found, you will not be allowed to add an SDV rule for this soil interpretation at this time:

1. No corresponding “not rated” phrase is defined.

In NASIS, by default, the “not rated” phrase is set to “Not rated”. NASIS allows you to change this phrase or even delete this phrase. In order to be able to create an unambiguous thematic map legend, Soil Data Viewer requires a non-null not rated phrase.

2. A rating class is defined where the rating class name is equal to the corresponding “not rated” phrase.

NASIS doesn’t prevent the creation of a rating class where the rating class name is equal to the “not rated” phrase. In order to be able to create an unambiguous thematic map legend, Soil Data Viewer does not permit this.

3. One or more rating classes without a rating class name are defined.

NASIS allows the creation of a soil interpretation with no corresponding rating class names, but the Soil Data Viewer application currently requires rating class names, since a rating class name is currently what is actually returned as the attribute value for a soil interpretation.

4. One or more rating classes without a rating class boundary value are defined.

NASIS erroneously allows you to define a rating class with no corresponding rating class boundary value. Without a rating class boundary value, the corresponding rating class name would never be returned.

5. Less than two distinct rating classes are defined.

It doesn't make any sense to create a soil interpretation with only one possible result, even though NASIS allows you to do so.

6. This limitation or suitability interpretation includes more rating classes than the current maximum allowable number of rating classes.

For limitation or suitability (non-class) soil interpretations, a predefined color is assigned to each distinct rating class, based on the total number of distinct rating class names. We refer to this color scheme as a "stoplight" color ramp, since it ranges from red to yellow to green. When there are more than three distinct rating classes, gradations between red and yellow, and yellow and green must be used. Since these colors are predefined, we only account for a certain maximum number of distinct rating classes. If we encounter a soil interpretation with more than the maximum allowable number of distinct rating classes (nine, when this was written), we are then unable to assign a color to each distinct rating class.

At the time this was written, there were no limitation or suitability soil interpretations in NASIS with more than nine distinct rating classes. If you have an interpretation with more than nine distinct rating classes, please contact the Soil Hotline and we will extend our maximum allowable number of distinct rating classes.

The determination of distinct rating class names is case sensitive. Therefore "Very limited" is not considered to be the same as "Very Limited". Even though NASIS allows it, you should never define two rating classes whose names differ only by case. Also, the desired convention for rating class names in general (at least for limitation and suitability soil interpretations) is to capitalize only the first word of a rating class name.

After clicking the plus sign to add a new SDV rule for the selected soil interpretation, some of the information needed for this soil interpretation SDV rule is then extracted from NASIS, some is then extracted from a data dictionary, and any default values are established.

For data entry guidelines for soil interpretation SDV rule attributes, please see the section titled “Soil Interpretation SDV Rule Data Entry Guidelines”.

Editing an Existing Soil Interpretation SDV rule

Any authorized SDV Rule Manager user who is a member of group “Soil Data Viewer” for a NASIS site other than “NSSC Pangaea” can only edit existing soil interpretation SDV rules owned by that NASIS site. Any authorized SDVRM user who is a member of group “Soil Data Viewer” for NASIS site “NSSC Pangaea” can edit any existing soil interpretation SDV rule owned by any NASIS site.

To edit an existing SDV rule, you first have to select that SDV rule. Please see the section titled “Selecting an Existing SDV Rule” for a detailed discussion of the process of selecting an existing SDV rule in order to view, edit or delete that rule.

After selecting an SDV rule, if you are authorized to edit that rule an edit icon/link will be visible at the top of the form.

For data entry guidelines for soil interpretation SDV rule attributes, please see the section titled “Soil Interpretation SDV Rule Data Entry Guidelines”.

The impact of changes to a soil interpretation (NASIS rule) for which a corresponding SDV rule exists

A soil interpretation SDV rule IS NOT automatically updated when its corresponding NASIS rule is updated.

If the ONLY change to a NASIS rule is an update to its rating classes, the corresponding SDV rule can be updated by editing that SDV rule, selecting the tab labeled “Map Legend” and then clicking the button under the custom map legend grid labeled “Reset to Defaults”.

If any of the following NASIS rule attributes are updated, any corresponding SDV rule must be dropped and re-added from scratch:

1. NASIS rule name
2. NASIS rule design (limitation, suitability, class)

3. NASIS rule “not rated phrase”.

Deleting an Existing Soil Interpretation SDV rule

Any authorized SDV Rule Manager user who is a member of group “Soil Data Viewer” for a NASIS site other than “NSSC Pangaea” can only delete existing soil interpretation SDV rules owned by that NASIS site. Any authorized SDVRM user who is a member of group “Soil Data Viewer” for NASIS site “NSSC Pangaea” can delete any existing soil interpretation SDV rule owned by any NASIS site.

To delete an existing SDV rule, you first have to select that SDV rule. Please see the section titled “Selecting an Existing SDV Rule” for a detailed discussion of the process of selecting an existing SDV rule in order to view, edit or delete that rule.

After selecting an SDV rule, if you are authorized to delete that rule a delete icon/link will be visible at the top of the form.

As long as you have the required authorization, you are never prevented from deleting an existing soil interpretation SDV rule, but at the moment you attempt to delete an SDV rule for a soil interpretation, if the Soil Data Mart database contains any instance of the corresponding soil interpretation, you will be given the opportunity to cancel the delete request. In general, we don’t want to have soil interpretations in the Soil Data Mart that have no corresponding SDV rule.

Soil Interpretation SDV Rule Data Entry Guidelines

The fields associated with a soil interpretation SDV rule are distributed among four different tabs: “General”, “Processing Options”, “Folder / Land Uses” and “Map Legend”.

When adding a new soil interpretation SDV rule, a default value has been assigned to every field for which it is possible to do so. This default value will be the most appropriate value in the majority of cases. Therefore, you shouldn’t change a default value unless you are sure that you understand the reason for doing so. The data entry guidelines for a field will discuss reasons for changing a default value.

Once you start adding or editing an SDV rule, the SDV Rule Manager application will not force you to save or cancel any pending edits prior to navigating out of the add/edit form. If you navigate out of adding or editing an SDV rule before saving all pending changes, all pending changes will be lost. If you need to view some other SDV related object while in the midst of editing some other SDV related object, you need to start a second SDV Rule Manager browser session in order to view that related SDV object.

General Tab

Most of the fields on the General Tab are used to identify, define and record the vintage of the corresponding SDV rule. For a soil interpretation SDV rule, the corresponding NASIS soil interpretation name and type (limitation, suitability or class) are identified.

General		Processing Options	Folder / Land Uses	Map Legend
NASIS Site:	NSSC Pangaea			
Interpretation:	ENG - Dwellings W/O Basements			
Interpretation Design:	Limitation			
Rule Name:	Dwellings Without Basements			
Rule Description:	<p>Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper.</p> <p>The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility.</p>			
Default Result Column Name:	DwellWOB			
Available in Basic Mode?	<input checked="" type="checkbox"/>			
Ready to Distribute?	<input checked="" type="checkbox"/>			
Last Updated:	1/30/2006 8:08:05 AM			

General Tab for limitation soil interpretation SDV rule “Dwellings Without Basements”.

NASIS Site

This is the name of the NASIS site that owns the corresponding soil interpretation and the corresponding SDV rule. This field cannot be edited.

Interpretation

This is the name of corresponding soil interpretation in NASIS. This field cannot be edited.

Interpretation Design

This is what is referred to as “Rule Design” in NASIS. The “Interpretation Design” value must be either “Limitation”, “Suitability” or “Class”. This field cannot be edited.

Rule Name

This is the name of the corresponding SDV rule. This is the name by which a user will identify an SDV rule in both Client Soil Data Viewer and Web Soil Survey. Look at other national SDV rule names to get a feel for the conventions that are used for SDV rule names. This field is required. No two SDV rules may have the same name.

A soil interpretation SDV rule name should obviously indicate the subject of the corresponding soil interpretation, but the SDV rule name does not necessarily have to include any specific part of the corresponding soil interpretation name. The SDV rule name should not include any category prefix in the corresponding soil interpretation name (e.g. AGR, AWM, ENG, etc.). In many cases, the SDV rule name has been set to the name of the corresponding soil interpretation, minus the category prefix, but there are numerous exceptions to this rule.

Changing a soil interpretation name potentially has a number of negative side effects, like breaking soil reports and SDV rules that still reference the previous soil interpretation name. Therefore, we tend to change a soil interpretation name as a last resort. But other than changing a name with which a user has become accustomed, changing an SDV rule name has no other negative side effects. Therefore we can reflect a preferred wording change in an SDV rule name, without having to actually change the name of the corresponding soil interpretation.

Certain characters that may occur in a soil interpretation name are not permitted in an SDV rule name. The following characters are not permitted in an SDV rule name:

∨:*?"<>|.∆

For a state specific soil interpretation, regardless of whether or not a national counterpart exists, the corresponding state postal code, in parenthesis, must be appended to end of the SDV rule name, e.g. “Dwellings With Basements (OH)”. This constraint is not enforced by the SDV Rule Manager application, but it is one of the things that a reviewer will check before making an SDV rule available for public dissemination.

Rule Description

This is a narrative description of the corresponding SDV rule. Look at other national SDV rule descriptions to get a feel for the conventions that are used for SDV rule descriptions. This field is required.

Default Result Column Name

When a thematic map is generated for the corresponding SDV rule, this will be the default column name into which the corresponding map unit rating will be stored. A Soil

Data Viewer user can change this default name at runtime. Look at other result column names to get a feel for the conventions that are used for result column names.* A result column name can include no more than ten characters, must begin with a letter and contain only letters, digits and underscores. This field is required.

*The formatting convention used for result column names is referred to as “CamelCase”, i.e. the first letter of a word or substring that represents a word is capitalized, and there are no spaces between words. Also, if you are creating an SDV rule for a state version of an existing national soil interpretation, I suggest using the same default result column name as that state soil interpretation’s national counterpart.

Available in Basic Mode?

This field indicates whether or not the corresponding SDV rule should be visible when the Client Soil Data Viewer application is in “Basic Mode”. Our current convention is that all limitation and suitability soil interpretation SDV rules should be available in Basic Mode. At the time this was written, we had no convention as to whether or not class soil interpretation SDV rules should always be available in Basic Mode.

For limitation and suitability soil interpretation SDV rules, this field is set (checked) by default. For class soil interpretation SDV rules, this field is not set (not checked) by default.

The Client Soil Data Viewer application is always either in Basic Mode or Advanced Mode. The intention is that the attributes available in Basic Mode should not require any runtime parameters for which no default value is defined, with the exception of any required data selection options, i.e. primary/secondary constraint selections.

There really isn’t any reason that a class soil interpretation SDV rule shouldn’t necessarily be available in Basic Mode. If you decide that a class soil interpretation SDV rule should be available in Basic Mode, you are responsible for setting this field.

Ready to Distribute? / Ready to Review?

In view mode, the label of this field will always be “Ready to Distribute?”. In edit mode, the label of this field will always be “Ready to Distribute?” for “NSSC Pangaea” users, and will always be “Ready for Review?” for non-“NSSC Pangaea” users.

Ready to Distribute?

This field indicates whether or not this SDV rule is ready to be included in exports from the Soil Data Mart. This field should never be set (checked) until the corresponding SDV

rule has actually been tested using the Client Soil Data Viewer application. More on this in a bit. For new SDV rules, this field is not set (not checked) by default.

This field cannot be set and saved unless:

1. All required fields are populated with valid values.
2. This SDV rule is associated with a folder.
3. Any corresponding custom map legend passes all custom map legend validations.

If any of these validations fail, you will be required to either fix the problem, or reset (uncheck) “Ready to Distribute?”, before you can save any edits.

Ready for Review?

Non-”NSSC Pangaea” users cannot explicitly set Ready to Distribute? When you determine that a non-national soil interpretation SDV rule is ready to distribute, you must check “Ready for Review?”, and then save the corresponding SDV rule. This will send an e-mail to the Soils Hotline letting them know that the corresponding SDV rule is ready to be reviewed. The Soil Hotline will then forward that request to someone on the NSSC staff. That person will then review that SDV rule and the corresponding soil interpretation in NASIS to ensure that all existing conventions and requirements have been satisfied. If there are no issues that need to be resolved, the reviewer will then set “Ready to Distribute?” and send you an e-mail confirmation. If there are issues that need to be resolved, “Ready to Distribute?” will be left not set, and your e-mail notification will cover all issues that need to be resolved.

Determining if an SDV Rule is Ready to Distribute

An SDV rule should not be distributed until it has actually been tested using the Client Soil Data Viewer application. This gives you a chance to see how that SDV rule is going to appear to an end user. You also need to verify that a thematic map can be generated, and that the thematic map and corresponding map legend look as you expect them to look.

How can you test a new SDV rule if that SDV rule can’t be exported from the Soil Data Mart until “Ready to Distribute?” has been set? To do so, you have to create a SSURGO export from either NASIS or the Staging Server. NASIS and Staging Server SSURGO exports will export an SDV rule, regardless of the setting of “Ready to Distribute?”, but keep in mind that a soil interpretation SDV rule still won’t be included in a SSURGO export from NASIS or the Staging Server unless the corresponding soil data includes the soil interpretation in question.

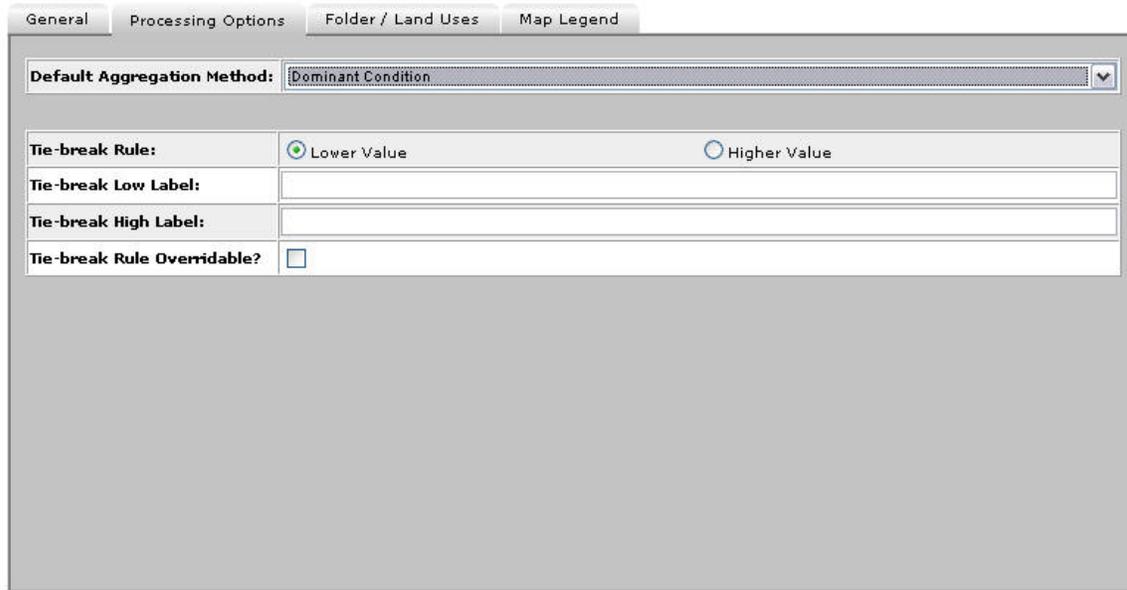
Keep in mind that in order to generate a thematic map, both tabular and spatial data are required. A SSURGO export from NASIS never includes spatial data, and a SSURGO export from the Staging Server only includes spatial data when the corresponding spatial data is currently loaded into the Staging Server database. If you know that spatial data for the survey area in question in the Soil Data Mart is still compatible with tabular data exported from NASIS, you could obtain the spatial data from a Soil Data Mart export.

Last Updated

This is the date and time when the corresponding SDV rule was last saved to the Soil Data Mart database. This value controls when an SDV rule in a SSURGO template database is updated. When importing tabular data, an existing SDV rule in a SSURGO template database will be updated only when the same SDV rule (“same” being based on the SDV rule’s internal key value) in the tabular data being imported has a more recent “Last Updated” date. This field cannot be edited.

Processing Options Tab

There are a number of parameters that affect the outcome of the aggregation process. The Processing Options Tab allows the SDV rule designer to provide a default value for each of those parameters, and for some parameters, the SDV rule designer can indicate whether or not a parameter’s default value can be changed at runtime.



Processing Options Tab for class soil interpretation SDV rule “Conservation Tree & Shrub Groups”.

Default Aggregation Method

Aggregation method determines how a single rating value for a map unit as a whole is derived from a set of individual map unit component values.

The default aggregation method for all soil interpretation SDV rules is “Dominant Condition”. Our current convention is to never change this default aggregation method. This default is arguably the most appropriate aggregation method, in general. Keep in mind that a Soil Data Viewer user is ALWAYS permitted to select any valid aggregation method at runtime.

This choice list contains only those aggregation methods that are suitable for the corresponding soil interpretation. For limitation and suitability soil interpretations, only aggregation methods “Dominant Condition”, “Dominant Component”, “Most Limiting” and “Least Limiting” are appropriate. For class soil interpretations, only aggregation methods “Dominant Condition”, “Dominant Component” and “All Components” are appropriate.

For a more complete discussion of aggregation methods and usage conventions, please see the section titled “Aggregation Methods – The Details”.

Tie-Break Rule

This field is displayed only when the corresponding SDV rule is for a class soil interpretation.

This field allows you to indicate whether the lower or higher rating class name should be returned in the event of a percent composition tie. Since the decision is based on an alphabetic comparison of rating class names, this is a pretty arbitrary decision. I suggest accepting the default value of “lower”, since that is our current convention. “Lower” is also the default tie-break rule for all non-numeric soil properties that have no corresponding logically ordered domain.

The reason you can’t specify the tie-break rule for limitation and suitability soil interpretations is because, by convention, our agency chooses to always return the more conservative value in the face of a percent composition tie, and we do not allow the option of returning the less conservative value in the face of a percent composition tie.

In determining lower/higher for limitation and suitability soil interpretations, we compare rating class values rather than rating class names. For limitation and suitability soil interpretations, these values can be logically ordered from “bad” to “good”. Therefore for limitation soil interpretations, in the event of a percent composition tie, we always select the higher rating class value, and for suitability soil interpretations, in the event of a percent composition tie, we always select the lower rating class value. Therefore in both cases, we are always returning the more conservative, or pessimistic, result.

Tie-Break Low Label

This field is displayed only when the corresponding SDV rule is for a class soil interpretation.

In the Soil Data Viewer interface, the default label for the option specifying that the lower value should be returned in the face of multiple candidate values or in the event of a percent composition tie is “Lower”. There are some cases, like permeability or flooding frequency, where a different label (Slower, Less Frequent) is more appropriate. This field allows you to override the default tie-break low label.

For a class soil interpretation, the possible rating class names cannot be logically ordered, at least not programmatically, so I suggest leaving this value blank. Obviously, this field is not required, but if a tie-break low label is provided, a tie-break high label must also be provided.

Tie-Break High Label

This field is displayed only when the corresponding SDV rule is for a class soil interpretation.

In the Soil Data Viewer interface, the default label for the option specifying that the higher value should be returned in the face of multiple candidate values or in the event of a percent composition tie is “Higher”. There are some cases, like permeability or flooding frequency, where a different label (Faster, More Frequent) is more appropriate. This field allows you to override the default tie-break high label.

For a class soil interpretation, the possible rating class names cannot be logically ordered, at least not programmatically, so I suggest leaving this value blank. Obviously, this field is not required, but if a tie-break high label is provided, a tie-break low label must also be provided.

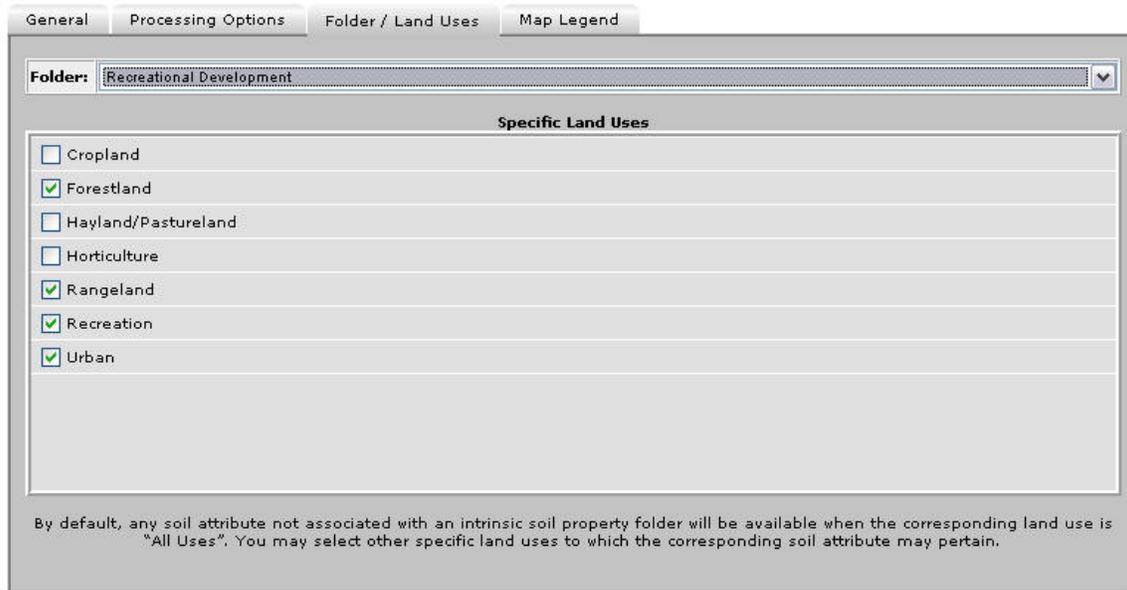
Tie-Break Rule Overridable?

This field is displayed only when the corresponding SDV rule is for a class soil interpretation.

When this option is set (checked), a Soil Data Viewer user can change the default setting of “Tie-Break Rule” at runtime. Since lower versus higher is such an arbitrary decision when it comes to rating class names, allowing the user to toggle the tie-break rule at runtime is pretty worthless, so I suggest leaving this option not set (not checked). This is also the default setting for all non-numeric soil properties that have no corresponding logically ordered domain.

Folder / Land Uses Tab

In order to be available to end users, an SDV rule *must* be associated with a folder. SDV rules associated with a non-intrinsic soil property folder *may* also be associated with one or more specific land uses. This controls which SDV rules are available in Web Soil Survey when the Web Soil Survey user has selected a specific land use. SDV rules not associated with any specific land are still available to a Web Soil Survey user when they have selected “All Uses”. Folder and land use associations are established on the Folder / Land Uses tab.



General Processing Options **Folder / Land Uses** Map Legend

Folder: Recreational Development

Specific Land Uses

- Cropland
- Forestland
- Hayland/Pastureland
- Horticulture
- Rangeland
- Recreation
- Urban

By default, any soil attribute not associated with an intrinsic soil property folder will be available when the corresponding land use is *All Uses*. You may select other specific land uses to which the corresponding soil attribute may pertain.

Folder / Land Uses Tab for limitation soil interpretation SDV rule “Camp Areas”.

Folder

This field allows you to associate an SDV rule with a folder. An SDV rule must be associated with a folder in order to be available in Client Soil Data Viewer and Web Soil Survey. The folders managed by the Soil Data Viewer Rule Manager application are shared by Client Soil Data Viewer and Web Soil Survey.

An SDV rule may be associated with one and only one folder. The dropdown list of folders available for a soil interpretation SDV rule does not include any intrinsic soil property folders.

As long as “Ready to Distribute?” or ”Ready to Review?” is not checked, an SDV rule can be saved without having to be associated with a folder.

When making folder assignments, it is helpful to have some idea about which SDV rules are already associated with which folders. But if you select and view a folder in the midst of adding or editing an SDV rule, without first saving your work, all pending changes will be lost. If you want to see which SDV rules are currently associated with a folder, while in the midst of adding or editing an existing SDV rule, you need to start a second SDV Rule Manager Browser session to select and view folders.

Specific Land Uses

The Web Soil Survey application allows soil interpretation SDV rules to be associated with one or more specific land uses. These associations are used to filter which SDV

rules are available for the current land use context, within Web Soil Survey. Web Soil Survey is always either in a specific land use context, like “Rangeland”, or in the land use context known as “All Uses”.

Soil interpretation SDV rules can be associated with zero, one or more specific land uses. A soil interpretation SDV rule that is not associated with any specific land use will still be available when the corresponding land use is “All Uses”. But when the current land use is a specific land use, “Rangeland” for example, only those soil interpretation SDV rules explicitly associated with land use “Rangeland” will be available.

For a soil interpretation SDV rule, all specific land uses (all land uses except “All Uses”) will be listed. To associate a soil interpretation SDV rule with a specific land use, the box to the left of that land use name should be checked. A soil interpretation SDV rule can be associated with zero, one or more specific land uses.

So why would you ever want an SDV rule to be available for “All Uses” but not for any specific land use? There may be interpretive soil attributes that really don’t pertain to any existing specific land use. By making such an attribute available for land use “All Uses”, we ensure that the corresponding SDV rule is at least available in one land use context.

Map Legend Tab

The Map Legend Tab includes information needed to construct a thematic map as well as that map’s corresponding map legend, for the corresponding SDV rule. The information on this tab is ultimately passed to ArcMap’s map generation process.

General Processing Options Folder / Land Uses Map Legend

Map Legend Name: Stoplight Interpretation - Defined

Custom Map Legend

Seq	Rating Value	Class Name
1	Very limited	Very limited
2	Somewhat limited	Somewhat limited
3	Not limited	Not limited

Reset to Defaults

Double-click on a row to change it.

Map Legend Tab for limitation soil interpretation SDV rule “Camp Areas”.

Map Legend Name

This field is used to specify the name of the map legend to be used when creating thematic maps for the corresponding SDV rule. The map legend name dropdown choice list will always contain only those map legends that are valid for the current context. A map legend name is always required.

A default map legend name will always be provided. In most cases, you should accept the default map legend name that is provided. For a discussion of considerations in selecting a map legend name, please see the section titled “Map Legends and Custom Map Legends – The Details”.

Custom Map Legend Grid

A custom map legend grid is displayed only when the corresponding SDV rule references a custom map legend type (Custom Classes, Custom Unique Values, Stoplight Interpretation).

When an SDV rule references a custom map legend type, in addition to the attributes associated with the corresponding “map legend” (map legend name, map legend type, color ramp type, color ramp name), a number of additional custom map legend attributes must be provided. Those custom map legend attributes are associated with the corresponding SDV rule, not with the corresponding “map legend”. A custom map legend allows a user to explicitly specify map legend class names and colors, and to group rating values into the same map legend class.

For a discussion of the data entry rules for custom map legends, please see the section titled “Map Legends and Custom Map Legends – The Details”.

Managing Folders

Keep in mind that any authorized SDV Rule Manager Application user can select and view any existing folder, but only someone who is a member of group “Soil Data Viewer” for NASIS site “NSSC Pangaea” can add, edit or delete a folder.

Folders are used to group SDV rules that are related in some manner. The folders managed by the SDV Rule Manager application are used in both Client Soil Data Viewer and for the Soil Data Viewer related interface in Web Soil Survey.

Folder Name	
	Building Site Development
	Construction Materials
	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

Select Folder Form

Folder Name:	Disaster Recovery Planning
Folder Description:	Disaster recovery planning interpretations are tools for evaluating the suitability of soil for various aspects of recovery operations in response to catastrophic events such as hurricanes, earthquakes, large fires, or terrorist attacks. Example interpretations include burial of large numbers of dead cattle, disposal of large amounts of debris, and composting of vegetative materials.
Intrinsic Soil Property Folder?	<input type="checkbox"/>
Last Updated:	10/25/2006 6:37:44 AM
Rules in this Folder:	Catastrophic Mortality, Large Animal Disposal, Pit Catastrophic Mortality, Large Animal Disposal, Trench Clay Liner Material Source Composting Facility - Subsurface Composting Facility - Surface Composting Medium and Final Cover Large Animal Disposal, Pit (MN) Rubble and Debris Disposal, Large-Scale Event

View Folder Form

Adding a New Folder

Keep in mind that only someone who is a member of group “Soil Data Viewer” for NASIS site “NSSC Pangaea” can add a folder.

To add a new folder, select “Folders: Add”.

For data entry guidelines for folder attributes, please see the section titled “Folder Data Entry Guidelines”.

Editing an Existing Folder

Keep in mind that only someone who is a member of group “Soil Data Viewer” for NASIS site “NSSC Pangaea” can edit an existing folder.

To edit an existing folder, you first have to select that folder. This can be done by selecting “Folders: Select”. This brings up a scrollable list of all existing folders. To select a folder, click the binoculars to the left of the folder name.

After selecting a folder, if you are authorized to edit that folder an edit icon/link will be visible at the top of the form.

For data entry guidelines for folder attributes, please see the section titled “Folder Data Entry Guidelines”.

Deleting an Existing Folder

Keep in mind that only someone who is a member of group “Soil Data Viewer” for NASIS site “NSSC Pangaea” can delete an existing folder.

To delete an existing folder, you first have to select that folder. This can be done by selecting “Folders: Select”. This brings up a scrollable list of all existing folders. To select a folder, click the binoculars to the left of the folder name.

After selecting a folder, if you are authorized to delete that folder a delete icon/link will be visible at the top of the form.

A folder that currently contains one or more SDV rules cannot be deleted. When a folder that you could normally delete cannot be deleted because it contains one or more SDV rules, a message explaining this is displayed in lieu of a delete icon/link.

Folder Data Entry Guidelines

All of the fields associated with a folder appear on the same form.

Once you start adding or editing a folder, the SDV Rule Manager application will not force you to save or cancel any pending edits prior to navigating out of the add/edit form. If you navigate out of adding or editing an SDV rule before saving all pending changes, all pending changes will be lost. If you need to view some other SDV related object while in the midst of editing some other SDV related object, you need to start a second SDV Rule Manager Browser session in order to view that related SDV object.

Folder Name:	Recreational Development
Folder Description:	<p>Recreational Development interpretations are tools designed to guide the user in identifying and evaluating the suitability of the soil for specific recreational uses.</p> <p>Example interpretations include camp areas, picnic areas, playgrounds, paths and trails, and off-road motorcycle trails.</p>
Intrinsic Soil Property Folder?	<input type="checkbox"/>

Add/Edit Folder Form

Folder Name

The value of this field is the folder name an end user sees when selecting SDV rules in both Client Soil Data Viewer and within Web Soil Survey. A folder name is required, and must contain 80 or fewer characters.

Folder Description

This field records a narrative description of what kinds of soil interpretations and/or soil properties are contained in the corresponding folder. A folder description is required.

Intrinsic Soil Property Folder?

This option should be set (checked) when the corresponding folder is intended to contain only intrinsic soil properties. Please see the section titled “Soil Attributes, Client Soil Data Viewer and Web Soil Survey” for a discussion of the different between intrinsic and non-intrinsic soil properties.

This option can only be set or reset when a folder is created. This option cannot be changed for an existing folder because changing this option for an existing folder would require land use associations to either be added or dropped for each SDV rule in that folder.

Managing Map Legends

Keep in mind that any authorized SDV Rule Manager Application user can select and view any existing map legend, but only someone who is a member of group “Soil Data Viewer” for NASIS site “NSSC Pangaea” can add, edit or delete a map legend.

This section discusses only the very basics of adding, editing and deleting map legends. For a description of exactly what constitutes a map legend, and additional details, please see the section titled “Map Legends and Custom Map Legends – The Details”.

	Map Legend Name
	Custom Classes - Defined
	Custom Classes - Progressive - Spectrum-Full Bright
	Custom Unique Values - Defined
	Custom Unique Values - Progressive - Spectrum-Full Bright
	Custom Unique Values - Random - Basic Random
	Natural Break Classes - Progressive - Spectrum-Full Bright
	Stoplight Interpretation - Defined
	Unique Values - Random - Basic Random

Select Map Legend Form

Adding a New Map Legend

Map Legend Name:	
Map Legend Type:	Custom Classes
Color Ramp Type:	Defined
Color Ramp Name:	N/A
Transparency (0-100):	0
Outline Width (0.00-10.00):	0.4
Outline Color Red/Green/Blue (0-255):	0 0 0

Add Map Legend Form – Note that Map Legend Type and Color Ramp Type can be specified for a new map legend.

Keep in mind that only someone who is a member of group “Soil Data Viewer” for NASIS site “NSSC Pangaea” can add a map legend.

To add a new map legend, select “Map Legends: Add”.

For data entry guidelines for map legend attributes, please see the section titled “Map Legend Data Entry Guidelines”.

Why would you want to add a new map legend? Most, if not all, of the map legends that you will ever need have already been defined. Keep in mind that a “map legend” only defines the general characteristics of a map legend.

In general, we want to use the same color ramp for all map legends using a progressive color ramp, and we want to use the same color ramp for all map legends using a random color ramp. In general, our current conventions are to use a progressive color ramp for soil attributes whose results can be logically ordered, and to use a random color ramp for soil attributes whose results cannot be logically ordered. For limitation and suitability soil interpretation SDV rules, we always want to use a stoplight color scheme.

In general, you should probably only consider adding a new map legend for one or more of the following reasons.

1. You decide that either the default progressive or default random color ramp that we chose was just a bad decision to begin with. In this case you should probably update all existing map legends that use the original default progressive or a random color ramp, as necessary.
2. You come up with a valid reason for using a different progressive or random color ramp in a special case.
3. You decide you need to specify something other than the current recommended default value for transparency, outline width or outline color.

Editing an Existing Map Legend

Keep in mind that only someone who is a member of group “Soil Data Viewer” for NASIS site “NSSC Pangaea” can edit an existing map legend.

To edit an existing map legend, you first have to select that map legend. This can be done by selecting “Map Legends: Select”. This brings up a scrollable list of all existing map legends. To select a map legend, click the binoculars to the left of the map legend name.

After selecting a map legend, if you are authorized to edit that map legend an edit icon/link will be visible at the top of the form.

For data entry guidelines for map legend attributes, please see the section titled “Map Legend Data Entry Guidelines”.

For an existing map legend that is currently referenced by one or more SDV rules, you are never allowed to edit the corresponding map legend type or color ramp type. This is due to that fact that changing these values for a map legend that is currently referenced by one or more SDV rules could create inconsistencies with existing custom map legend specifications, resulting in a requirement for a custom map legend where one did not previously exist, or resulting in the need to drop a custom map legend where one previously existed. A message is displayed when the editing of certain map legend fields is restricted.

Deleting an Existing Map Legend

Keep in mind that only someone who is a member of group “Soil Data Viewer” for NASIS site “NSSC Pangaea” can delete an existing map legend.

To delete an existing map legend, you first have to select that map legend. This can be done by selecting “Map Legends: Select”. This brings up a scrollable list of all existing map legends. To select a map legend, click the binoculars to the left of the map legend name.

After selecting a map legend, if you are authorized to delete that map legend a delete icon/link will be visible at the top of the form.

A map legend that is currently referenced by one or more SDV rules cannot be deleted. When a map legend that you could normally delete cannot be deleted because it is currently referenced by one or more SDV rules, a message explaining this is displayed in lieu of a delete icon/link.

Map Legend Data Entry Guidelines

All of the fields associated with a map legend appear on the same form.

Once you start adding or editing a map legend, the SDV Rule Manager application will not force you to save or cancel any pending edits prior to navigating out of the add/edit form. If you navigate out of adding or editing an SDV rule before saving all pending changes, all pending changes will be lost. If you need to view some other SDV related object while in the midst of editing some other SDV related object, you need to start a second SDV Rule Manager Browser session in order to view that related SDV object.

Map Legend Name:	Custom Unique Values - Progressive - Spectrum-Full Bright
Map Legend Type:	Custom Unique Values
Color Ramp Type:	Progressive
Color Ramp Name:	Spectrum-Full Bright
Transparency (0-100):	0
Outline Width (0.00-10.00):	0.4
Outline Color Red/Green/Blue (0-255):	0 0 0

Edit Map Legend Form – Notice that Map Legend Type and Color Ramp Type cannot be changed. That is because this map legend is currently associated with one or more SDV rules.

Map Legend Name

This field specifies the name by which a map legend is identified. No two map legends may have the same map legend name. This field is required.

Our current convention is that, at a minimum, a map legend name must be composed of at least two or three parts, separated by dashes:

Map Legend Type Name – Color Ramp Type Name – Color Ramp Name

The color ramp name is included only when the corresponding color ramp type name is not “Defined”.

Here are the map legend names that were defined at the time this document was written.

Map Legend Name
Custom Classes - Defined
Custom Classes - Progressive - Spectrum-Full Bright
Custom Unique Values - Defined
Custom Unique Values - Progressive - Spectrum-Full Bright
Custom Unique Values - Random - Basic Random
Natural Break Classes - Progressive - Spectrum-Full Bright
Stoplight Interpretation - Defined
Unique Values - Random - Basic Random

If two different map legends share the same map legend type name and color ramp type name (where color ramp type name is “Defined”), or map legend type name, color ramp type name and color ramp name (where color ramp type name is not “Defined”), the map legend name should somehow indicate how those two map legends differ. For example:

Custom Classes – Defined – Black Border
 Custom Classes – Defined – Red Border

or

Unique Values – Random – Basic Random – 0% Transparent
 Unique Values – Random – Basic Random – 50% Transparent

Map Legend Type

A map legend type defines the general characteristics of a map legend. This field is required.

We currently define five different types of map legends.

Natural Break Classes

For a natural break classes map legend, each map legend class corresponds to a range of possible values. The map legend accounts for only those values that occur in the underlying data. The map legend classes and labels are dynamically determined at runtime, based on naturally occurring breaks in the underlying data. The desired number of classes is specified as part of the corresponding SDV rule.

This kind of map legend is only suitable for numeric attributes. This is one of the valid candidate map legend types for attributes for which all possible values cannot be enumerated prior to runtime.

Custom Classes

A custom classes map legend is a class type of map legend where the map legend class ranges are explicitly defined prior to runtime. The ability to predefine all map legend classes makes it possible for the map legend to account for all possible values. This type of map legend allows you specify a map legend class name that is something other than the corresponding range of values. This type of map legend also allows you to explicitly define the range for each map legend class, and to define the colors associated with each map legend class. This type of map legend is typically used for continuous numeric attributes for which predefined, generally accepted class ranges are already defined.

Unique Values

For a unique values map legend, the map legend includes a class for each unique value that occurs in the underlying data. The map legend accounts for only those values that occur in the underlying data. The map legend classes and labels are dynamically determined at runtime.

This kind of map legend is best suited for attributes where the number of possible values is relatively small. It is most typically used for non-numeric attributes, but it can also be used for numeric attributes. This is one of the valid candidate map legend types for attributes for which all possible values cannot be enumerated prior to runtime.

Custom Unique Values

A custom unique values map legend is a unique values type of map legend where map legend classes are explicitly defined prior to runtime. A custom unique values map legend typically accounts for all possible values, not just those included in the underlying data. This type of map legend allows you to specify a map legend class name that is different from its corresponding value. This type of map legend also allows you to do such things as explicitly order the map legend classes, group more than one value into the same map legend class, and explicitly define the colors associated with each map legend class.

Stoplight Interpretation

A stoplight interpretation map legend is really a special instance of a custom unique values map legend. We coined this map legend type for use with limitation and suitability soil interpretation SDV rules. The fact that this is a variant of a custom unique values map legend makes it possible to account for all possible soil interpretation rating class values. But because we want to use a standard stoplight color scheme for all limitation and suitability soil interpretation SDV rules, we predefine those colors, based on the number of distinct map legend classes, and then

automatically assign those colors when the corresponding SDV rule is saved. This is the only kind of map legend that can be specified for a limitation or suitability soil interpretation SDV rule.

Color Ramp Type

Color ramp type indicates how the colors associated with each map legend class will be assigned. This field is required.

We currently define three different types of color ramps.

Progressive

I don't know how to technically define a progressive color ramp. Visually, it includes one or more segments where a color at one end of a segment gradually becomes a different color at the other end of that segment. Because this color morphing implies a progression, in the Soil Data Viewer application we tend to use progressive color ramps for attributes whose values can be logically ordered. The range of output values are associated with colors along the ramp, from low to high, i.e. lower values are assigned colors towards the left end of the ramp, and higher values are assigned colors towards to right end of the ramp. The progressive color ramp that we are using as our default, at least at the time this was written, "Spectrum-Full Bright", is shown below.



Progressive Color Ramp "Spectrum-Full Bright"

We chose Spectrum-Full Bright as the default progressive color ramp because it seemed to provide the best color separation for larger numbers of map legend classes.

Random

I don't know how to technically define a random color ramp. Visually, it includes a number of adjacent color bars that tend to look like they are all based on some underlying unified theme (pastels, earth tones, etc.). In a random color ramp, there doesn't appear to be any logical progression to the colors, therefore in the Soil Data Viewer application we tend to use random color ramps for attributes whose values cannot be logically ordered. Somehow, pseudo randomly I assume, each output value is associated with some color derived from the corresponding random color ramp. I'm not entirely sure that some colors aren't reused, in cases where

the map legend includes a large number of classes. At a minimum, they are sometime so close that you can't tell them apart. The random color ramp that we are using as our default, at least at the time this was written, "Basic Random", is shown below.



Random Color Ramp "Basic Random"

We chose "Basic Random" as the default random color ramp simply because it seemed to have the most distinct and vibrant colors among all available random color ramps.

Defined

Technically, "Defined" is not a color ramp type. It actually represents the absence of a color ramp. When the color ramp type is "Defined", the color associated with each map legend class must be explicitly defined.

For a given map legend type, not all color ramp types may be permitted. The following table shows which color ramp types are available for each map legend type, and which color ramp type is the default for is corresponding map legend type.

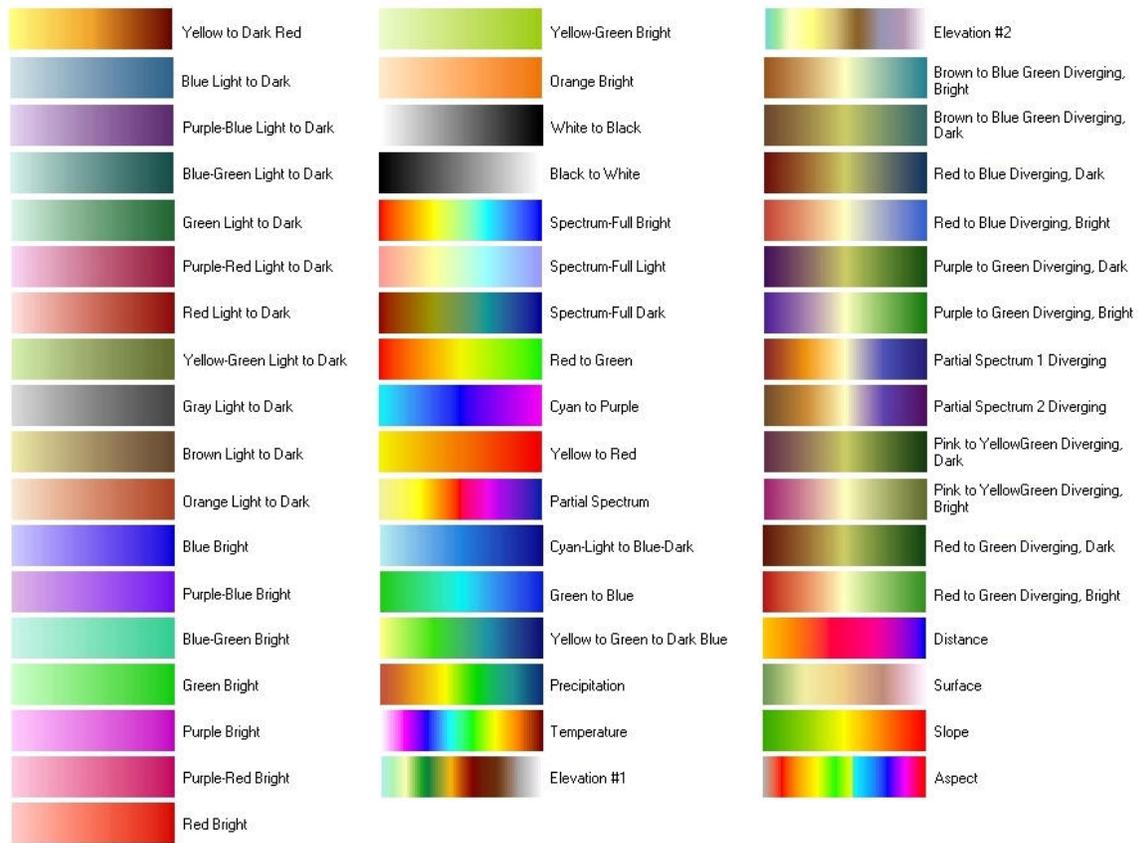
Map Legend Type Name	Color Ramp Type Name	Default?
Custom Classes	Defined	Yes
Custom Classes	Progressive	No
Custom Classes	Random	No
Custom Unique Values	Defined	Yes
Custom Unique Values	Progressive	No
Custom Unique Values	Random	No
Natural Break Classes	Progressive	Yes
Stoplight Interpretation	Defined	Yes
Unique Values	Progressive	No
Unique Values	Random	Yes

Color Ramp Name

This field specifies the name by which a color ramp is identified. No two color ramps may have the same color ramp name. When the corresponding value of color ramp type is either "Progressive" or "Random", a selection for this field is required. When the corresponding value of color ramp type is "Defined", this choice list is not available.

This choice list displays the names of all available color ramps for the current corresponding color ramp type. There is one set of names for progressive color ramps and an entirely different set of names for random color ramps. The current sets of available progressive and random color ramps are those that were predefined by ESRI at the time the Soil Data Viewer application was originally written. Our GIS programmer tells me that we probably do have the option of defining our own color ramps, but we see no need to do so.

In many cases you can't really tell what a color ramp looks like, based only on its name. Clicking the binoculars to the right of this choice list displays a graphic showing a visualization of the actual color ramp associated with each color ramp name.



Available Progressive Color Ramps



Available Random Color Ramps

Transparency

This field permits you to specify the percent transparency of the map legend colors assigned to the map units in a thematic map. This field is required.

Our current convention is to leave this value set to its default of 0% (non-transparent). This means that layers beneath a Client Soil Data Viewer thematic map layer will not be visible.

If you do change the default setting of this field, that change should be reflected in the corresponding map legend name.

This is the one instance I'm aware of where the same value is not used for both Client Soil Data Viewer and Web Soil Survey. Client Soil Data Viewer will use whatever value

is entered here for transparency. Web Soil Survey ignores whatever value is entered here for transparency, and always automatically sets transparency to 50%, so that the underlying orthophotography will always be visible.

Outline Width

This field permits you to specify the width, in points, of the line that borders all map unit polygons in a Soil Data Viewer thematic map. This field is required.

Our current convention is to leave this value set to its default of 0.4 points.

If you do change the default setting of this field, that change should be reflected in the corresponding map legend name.

Outline Color Red/Green/Blue

These fields permit you to specify the color components of the line that borders all map unit polygons in a Soil Data Viewer thematic map. Each individual value must be an integer value in the range 0 to 255, inclusive. These fields are required.

Our current convention is to leave each of these values set to its default of 0, which results in a black border line.

If you do change the default setting of these fields, that change should be reflected in the corresponding map unit name.

Map Legends and Custom Map Legends – The Details

Introduction

Every SDV rule must reference a map legend. A “map legend” specifies a map legend name, a map legend type, a color ramp type, and, when the color ramp type is not “Defined”, a color ramp name.

A map legend represents a fairly general concept. The same map legend is typically associated with a number of SDV rules. This is because the map legend itself only specifies the very general characteristics of a map legend. Because a map legend represents a fairly general concept that is reused for a variety of SDV rules, the total number of map legends defined at any given time should be relatively small. For further details on what is encompassed by the term “map legend”, please see the section titled “Managing Map Legends”.

When an SDV rule references a custom map legend, in addition to the attributes associated with the corresponding “map legend” (map legend name, map legend type, color ramp type, color ramp name), a number of additional custom map legend attributes must be provided. Those custom map legend attributes are associated with the corresponding SDV rule, not with the corresponding “map legend”. A custom map legend allows a user to explicitly specify map legend class names and colors, and to group aggregation rating values into the same map legend class.

Default and Allowable Map Legends

For a description of any map legend type or color ramp type, please see the section titled “Map Legend Data Entry Guidelines”. Any color ramp types and color ramp names in this section represent our current preferred convention for the corresponding situation. In the discussion below, please keep the following in mind. A soil property whose corresponding logical data type is “Choice” is one that has an associated fixed domain or choice list of allowable values. A soil property whose corresponding logical data type is “Narrative Text” is used to record variable length narrative text, which can include line breaks.

1. For a limitation or suitability soil interpretation SDV rule, the default and only allowable map legend type is “Stoplight Interpretation”. The Soil Survey Division wants the same paradigm used for all limitation or suitability soil interpretation SDV rules. This paradigm ensures that all potential rating values are accounted for and that a stoplight color scheme is used for the corresponding set of map legend classes.

2. For a class soil interpretation SDV rule, the only allowable type of map legend is “Custom Unique Values”. The default map legend is the first* map legend whose corresponding type is "Custom Unique Values", and whose corresponding color ramp type is "Random", and whose corresponding color ramp name is "Basic Random".

This forces all potential rating values to be accounted for, and the default color scheme represents our current preferred convention for attributes whose values cannot be logically ordered, which we are obviously assuming is the case for most class soil interpretation SDV rules.

In those cases where the results of a class soil interpretation can be logically ordered, you should select a “Custom Unique Values” type of map legend where the corresponding color ramp type name is “Progressive”, and the corresponding color ramp name is “Spectrum-Full Bright”, which is our current preferred convention for attributes whose values can be logically ordered. In this case you would also need to ensure that the map legend classes are correctly ordered in the custom map legend grid. For class soil interpretation SDV rules, by default, the records in the custom map legend grid are sorted in ascending order on the corresponding Rating Value (which in this case corresponds to a soil interpretation rating class name). If the rating class names for a class soil interpretation SDV rule can be logically ordered, this default sort order won’t likely reflect that ordering.

3. For a soil property SDV rule where the corresponding logical data type is “Choice” and the corresponding domain is not logically ordered, the only allowable type of map legend is “Custom Unique Values”. The default map legend is the first* map legend whose corresponding type is “Custom Unique Values”, and whose corresponding color ramp type is “Random”, and whose corresponding color ramp name is “Basic Random”.

This forces all potential rating values to be accounted for, and the default color scheme represents our current preferred convention for attributes whose values cannot be logically ordered.

4. For a soil property SDV rule where the corresponding logical data type is “Choice” and the corresponding domain is logically ordered, the only allowable type of map legend is “Custom Unique Values”. The default map legend is the first* map legend whose corresponding type is "Custom Unique Values", and whose corresponding color ramp type is "Progressive", and whose corresponding color ramp name is "Spectrum-Full Bright".

This forces all potential rating values to be accounted for, and the default color scheme represents our current preferred convention for attributes whose values can be logically ordered.

5. For a soil property SDV rule where the corresponding logical data type is “Float”, the allowable map legend types are “Natural Break Classes” and “Custom Classes”. The

default map legend is the first* map legend whose corresponding type is "Natural Break Classes", and whose corresponding color ramp type is "Progressive", and whose corresponding color ramp name is "Spectrum-Full Bright".

The default choices represent our current preferred convention for floating point soil property attributes. In most cases, a "Natural Break Classes" map legend is probably the most appropriate type of map legend, even though a "Natural Break Classes" type of map legend doesn't necessarily reflect all possible values. But exceptions do exist.

In some cases, existing standard classes may be already be associated with a soil property, e.g. saturated hydraulic conductivity, or you may wish to specify classes that account for the full range of possible values. In this case you should select a "Custom Classes" type of map legend.

6. For a soil property SDV rule where the corresponding logical data type is "Integer", the allowable map legend types are "Natural Break Classes", "Custom Classes", "Unique Values" and "Custom Unique Values". The default map legend is the first* map legend whose corresponding type is "Natural Break Classes", and whose corresponding color ramp type is "Progressive", and whose corresponding color ramp name is "Spectrum-Full Bright".

The default choices represent our current preferred convention for integer soil property attributes. In most cases, a "Natural Break Classes" map legend is probably the most appropriate type of map legend, even though a "Natural Break Classes" type of map legend doesn't necessarily reflect all possible values. But exceptions do exist.

In some cases, existing standard classes may be already be associated with a soil property, or you may wish to specify classes that account for the full range of possible values. In this case you should select a "Custom Classes" type of map legend.

In rare cases, when the number of allowable values for an integer soil property is limited to a known set, you may want the corresponding map legend to reflect each individual possible value. T factor is an example of such a soil property. In such a case you should select a "Custom Unique Values" type of map legend.

When the number of allowable values for an integer soil property is limited, and you want a separate map legend class for each value that occurs in the underlying data, but the number of allowable values is still too large to explicitly specify each possible value, you should select a "Unique Values" type of map legend. At the time this was written, we didn't have an attribute that reflected this case. In general, we prefer that our map legends reflect all possible values.

Regardless of the type of map legend ultimately selected, you should probably either provide explicitly sequenced colors or use the progressive color ramp named "Spectrum-Full Bright", which is our current convention for attributes whose values can be logically ordered.

7. For a soil property SDV rule where the corresponding logical data type is either “String” or “Narrative Text”, the only allowable type of map legend is “Unique Values”. The default map legend is the first* map legend whose corresponding type is “Unique Values”, and whose corresponding color ramp type is “Random”, and whose corresponding color ramp type name is “Basic Random”.

The default choices represent our current preferred convention for non-numeric soil property attributes whose values cannot be logically ordered.

**Default map legends are selected from a list of all map legends of the appropriate types, where the list of appropriate map legends is sorted in ascending order on map legend name. When no map legend in the list meets the corresponding requirements, the first map legend in the list is returned. This scheme has the advantage that the sort will result in the selection of the more general version of a map legend, when there are multiple map legends for the same combination of map legend type, color ramp type and color ramp name, i.e. "Unique Values – Random – Basic Random" would be selected rather than "Unique Values – Random – Basic Random – 50% Transparency". Of course this assumes that our map legend naming conventions are being religiously followed.*

Custom Map Legends

A custom map legend is a map legend where the corresponding map legend classes are explicitly specified prior to runtime, rather than being automatically derived at runtime. Any explicitly specified map legend classes are stored as part of an SDV rule, rather than as part of a “map legend”.

Reasons for Selecting a Custom Map Legend

Why go to the work of creating a custom map legend rather than letting the map legend be derived dynamically at runtime?

1. If you want to guarantee that the map legend will account for all possible values, this can only be done with a custom map legend. Of course this can only be done when all possible values can be explicitly enumerated or expressed as a set of numeric ranges that account for all possible values. In general, when possible, a map legend should account for all possible values.
2. If you want to explicitly define the color associated with each map legend class, this can only be done with a custom map legend.
3. If you want to explicitly sequence the classes in a map legend where the desired sequencing cannot be derived from the underlying data, this can only be done with a custom map legend.

4. If you want to explicitly specify a name for a map legend class that can't be derived from the underlying data, this can only be done with a custom map legend.
5. If you want to explicitly merge rating values into the same map legend class in a way that will not occur naturally, this can only be done with a custom map legend.

Custom Map Legend Grid

A row in the custom map legend grid defines all or part of a map legend class, and indicates the sequence of that map legend class in the map legend. A row indicates a value or set of values that should be grouped into the corresponding map legend class. A row can optionally indicate the color associated with the corresponding map legend class.

A map legend class corresponds to a single item in a map legend.

Custom Map Legend Grid Contents

From a data entry standpoint, there are two basic kinds of custom map legends.

In one case every row in the custom map legend table corresponds to a range of numeric values. In this case the corresponding map legend type will always be “Custom Classes”. For every row, you must specify the lower end of the range, “Lower Rating Value” and the upper end of the range, “Upper Rating Value”, which indicates the range of values that will be grouped into the corresponding map legend class. Keep in mind that more than one range can be grouped into the same map legend class.

	Seq	Lower Rating Value	Upper Rating Value	Class Name
	1	0	0.01	Very Low (0.0 - 0.01)
	2	0.01	0.1	Low (0.01 - 0.1)
	3	0.1	1	Moderately Low (0.1 - 1)
	4	1	10	Moderately High (1 - 10)
	5	10	100	High (10 - 100)
	6	100	705	Very High (100 - 705)

Custom Map Legend Grid for soil property SDV rule “Saturated Hydraulic Conductivity (Ksat), Standard Classes”.

In the other case, every row in the custom map legend table corresponds to a single numeric or alphanumeric value. In this case the corresponding map legend type will be either “Custom Unique Values” or “Stoplight Interpretation”. “Stoplight Interpretation” is a special instance of a custom unique values map legend. For every row, you must specify a single value, “Rating Value”, that will be grouped into the corresponding map

legend class with the name specified in “Class Name”. Keep in mind that more than one value can be grouped into the same map legend class.

Custom Map Legend		
Seq	Rating Value	Class Name
1	Excessively drained	Excessively drained
2	Somewhat excessively drained	Somewhat excessively drained
3	Well drained	Well drained
4	Moderately well drained	Moderately well drained
5	Somewhat poorly drained	Somewhat poorly drained
6	Poorly drained	Poorly drained
7	Very poorly drained	Very poorly drained

Custom Map Legend Grid for soil property SDV rule “Drainage Class”.

Every custom map legend grid will always include columns “Seq” and “Class Name”. The value of column “Seq” orders the classes in the map legend from top to bottom. Rows corresponding to the same map legend class must share the same sequence value. “Class Name” records the name of the corresponding map legend class.

When the color ramp type of the corresponding map legend is “Defined”, and the corresponding map legend type is not “Stoplight Interpretation”, the custom map legend grid will include four additional columns, “Red”, “Green”, “Blue” and “Color”. Columns “Red”, “Green” and “Blue” allow you to explicitly specify the color components of the color swatch associated with the corresponding map legend class. Column “Color” shows the color that results from the combination of the specified color components.

Custom Map Legend							
Seq	Rating Value	Class Name	Red	Green	Blue	Color	
1	High	High	255	0	0		
2	Moderate	Moderate	255	255	0		
3	Low	Low	0	255	0		

Custom Map Legend Grid for soil property SDV rule “Corrosion Concrete”.

Custom Map Legend Grid Auto-Population and Related Controls

When you add a new SDV rule for any soil interpretation or for any soil property with a corresponding domain, the custom map legend grid will automatically be populated for you.

For a soil interpretation, the custom map legend grid will be populated with all rating classes that are defined for the corresponding soil interpretation. For limitation and

suitability soil interpretations, by default the rows in the grid will always be sequenced from “bad”/“most unsuitable”/red to “good”/“most suitable”/green. For class soil interpretations, by default the rows in the grid will always be sequenced in ascending order by Rating Value, which in this case contains a soil interpretation rating class name.

For a soil property with an associated domain, the custom map legend grid will be populated with the contents of the domain associated with the corresponding soil property. By default, the rows in the grid will be sequenced based on the sequence numbers that are already defined for the corresponding domain.

In cases where the custom map legend grid is automatically populated, you are not permitted to add new rows or drop existing rows, the idea being that the map legend should account for every possible rating value. There is no need to add a row since the map legend grid will include all possible rating values, by default.

In cases where the custom map legend grid is automatically populated, you are still permitted to edit existing rows, in order to edit map legend class names, explicitly specify the color associated with a map legend class, and to be able to merge values or ranges of values into the same map legend class.

In cases where the custom map legend grid is automatically populated, directly underneath the map legend grid there will be a button labeled “Reset to Defaults”. Clicking this button repopulates the custom map legend grid from scratch, replacing any existing contents. You might want to do this because you just want to start over from scratch, or the rating classes of the corresponding soil interpretation or the corresponding domain has been updated, since the corresponding SDV rule was last updated.



Custom Map Legend Grid for soil interpretation SDV rule “Conservation Tree & Shrub Groups”, showing the “Reset to Defaults” Button.

Custom Map Legend Grid Data Entry Guidelines and Controls

For any attribute other than a soil interpretation or a soil property with an associated domain, in edit mode you can add, edit or delete rows from the custom map legend grid. For soil interpretations and soil properties with an associated domain, you are restricted to editing existing rows in the map legend grid.

To add a new row, click the button directly underneath the custom map legend grid that is labeled “Add Row”.

To edit an existing row, double click that row.

Custom Map Legend Class

Sequence:	4	
Rating Values (Lower-Upper):	1	10
Class Name:	Moderately High (1 - 10)	

OK Cancel

Add/Edit Row Form for a Custom Classes Type Map Legend (Color Ramp Type <> “Defined”)

Custom Map Legend Class

Sequence:	3		
Rating Value:	3		
Class Name:	3		
Color Red/Green/Blue (0-255):	255	255	0

OK Cancel

Add/Edit Row Form for a Custom Unique Values Type Map Legend (Color Ramp Type = “Defined”)

To delete an existing row, click a row to select that row and then press the delete key.

Below is a list of all columns that can appear in the custom map legend grid. Not all of these columns will be visible at any given time.

Seq

This field specifies the top to bottom sequence of the corresponding map legend class specified in “Class Name”, in the map legend. This field is always visible and always editable, although how this column should be edited is conditional.

Although more than one row may share the same sequence value (more on this later), the lowest sequence value must be 1, and there cannot be any gaps between sequence values. You will not be able to save an SDV rule with a custom map legend that violates either of these constraints.

For limitation and suitability soil interpretations, the relative sequence of the rating classes should never be changed. The reason for this is that our convention for both limitation and suitability soil interpretation SDV rules is to always order the map legend classes from “bad” to “good”, i.e. from “Red” to “Green”. The default sequence values reflect this desired ordering.

For soil properties associated with a logically ordered domain (Logical Data Type = Choice (logically ordered)), the relative sequence of the domain members should not be changed, since the default sequence values reflect the appropriate low to high ordering.

Sequence values can be edited in order to merge values or ranges into the same map legend class.

Lower Rating Value/Upper Rating Value

These two fields correspond to a range of numeric values that should be grouped into the corresponding map legend class. These columns appear only when the corresponding map legend type is “Custom Classes”. When visible, both columns must contain a valid numeric value, and the lower value must be less than the higher value. Unfortunately you cannot specify only one value in order to create a class for all values less than some value, or all values greater than some value. To create such a range you would have to specify a value lower or higher than the lowest or highest possible value.

Note that with the exception of the lowest range, the low end of the range is exclusive and the upper end of the range is inclusive. For the lowest range, the lower end of the range and the upper end of the range are both inclusive.

Rating Value

This field corresponds to a single numeric or alphanumeric rating value that should be grouped into the corresponding map legend class. This column appears only when the corresponding map legend type is “Custom Unique Values” or “Stoplight Interpretation”. When visible, this column must contain a string containing 254 or fewer characters.

For a soil interpretation SDV rule, this field always contains one of the rating class names that were defined for the corresponding soil interpretation.

For an SDV rule for a soil property associated with a domain, this field always contains the longer, typically mixed case string, i.e. choice label, that is used to represent a particular domain member or choice.

Class Name

This field is used to record the name of the map legend class into which the corresponding value or range of values will be grouped. This is the name that will actually appear in the map legend of any thematic map for the corresponding soil interpretation or soil property. This field is always visible and always editable. A map legend class name must contain 254 or fewer characters.

For what it's worth, our current convention is that a map legend class name should never include any corresponding units of measure. Any corresponding units of measure will always be reflected in the title associated with a map legend.

For a soil interpretation SDV rule, the default value for this field is set to the corresponding value of "Rating Value", which is one of the rating class names that were defined for the corresponding soil interpretation. For this case, our current convention is to leave the map legend class name set to the corresponding rating class name.

For an SDV rule for a soil property associated with a domain, the default value for this field is set to the corresponding value of "Rating Value", which contains the longer, typically mixed case string, i.e. choice label, that is used to represent a particular domain member or choice. For this case our convention is to leave the map legend class name set to the corresponding choice value.

Red Color Value/Green Color Value/Blue Color Value/Resulting Color

These fields are used to explicitly specify and preview the color associated with the corresponding map legend class. These fields are visible only when the corresponding color ramp type is "Defined" and the corresponding map legend type is not "Stoplight Interpretation". Each individual color component value must be an integer number in the range 0 – 255. Field "Color" shows the color that results from the combination of the specified color components.

At the time this was written, there were only four attributes for which custom colors were defined (Corrosion Concrete, Corrosion Steel, Frost Free Days and T Factor), and in each of these cases the explicitly specified colors corresponded to the same colors used for a stoplight color ramp for a specified number of rating classes. In other words, other than to sometimes specify the same red to yellow to green colors that we use for soil

interpretations, we haven't found any need to get any more creative when it comes to custom colors.

Should such a need ever arise, you'll probably need access to some application that can tell you the red, green and blue color component values associate with a selected color. Such an application is sometimes referred to as a color picker application. A Google search on "color picker" should come up with one or more free or web accessible versions of such an application.

Below is a table showing the color component values we currently use for a stoplight color ramp, for 2 to 9 map legend classes.

Number Map Legend Classes	Red to Green Class Sequence	Red Color Component	Green Color Component	Blue Color Component
2	1	255	0	0
2	2	0	255	0
3	1	255	0	0
3	2	255	255	0
3	3	0	255	0
4	1	255	0	0
4	2	255	170	0
4	3	169	255	0
4	4	0	255	0
5	1	255	0	0
5	2	255	127	0
5	3	255	255	0
5	4	127	255	0
5	5	0	255	0
6	1	255	0	0
6	2	255	102	0
6	3	255	204	0
6	4	203	255	0
6	5	101	255	0
6	6	0	255	0
7	1	255	0	0
7	2	255	85	0
7	3	255	170	0
7	4	255	255	0
7	5	169	255	0
7	6	84	255	0
7	7	0	255	0
8	1	255	0	0
8	2	255	72	0
8	3	255	144	0

8	4	255	216	0
8	5	216	255	0
8	6	144	255	0
8	7	72	255	0
8	8	0	255	0
9	1	255	0	0
9	2	255	63	0
9	3	255	127	0
9	4	255	191	0
9	5	255	255	0
9	6	191	255	0
9	7	127	255	0
9	8	63	255	0
9	9	0	255	0

Merging Values into the Same Map Legend Class

There may be cases where you wish to merge individual values or ranges into the same map legend class. This is done by setting the sequence value for all rows that should be merged into the same map legend class, to the same value.

All rows in the custom map legend grid with the same sequence value must also have the same value for “Class Name” and “Red”, “Green” and “Blue”, when present. You will not be able to save an SDV rule with a custom map legend that violates this constraint.

Under what situations might one wish or need to do this? At the time that this was written, there were only two types of cases where this was done.

In one case, some of the older forestry interpretations had rating class names that differed only by case, e.g. “Not limited” and “Not Limited”. By default, Soil Data Viewer recognizes these as two distinct rating classes. Therefore in order to merge these two distinct rating class names into the same map legend class, they were assigned the same sequence value. In general, in such a case, the underlying soil interpretation should be fixed, but there was a period of time when we were hesitant to make any changes to the existing older forestry soil interpretations, so we worked around this problem without editing the underlying soil interpretation.

Custom Map Legend		
Seq	Rating Value	Class Name
1	Very severe	Very severe
1	Very Severe	Very severe
2	Severe	Severe
3	Moderate	Moderate
4	Slight	Slight

Double-click on a row to change it.

Custom Map Legend Grid for soil interpretation SDV rule “Potential Erosion Hazard (Road, Trail)”.

The other case where we have merged values into the same map legend class is for domains that include obsolete values that can be mapped into a non-obsolete value. Take the SDV rule “Flooding Frequency” for example. This domain includes the now obsolete choice “Common”. Since every possible domain value must be accounted for, the default custom map legend grid includes a row for “Common”. Since we don’t want “Common” to appear in the map legend, and since “Common” is considered equivalent to “Frequent”, the rows for “Common” and “Frequent” were edited to have the same sequence value, and both values are mapped to map legend class “Frequent”.

Custom Map Legend		
Seq	Rating Value	Class Name
1	None	None
2	Very rare	Very Rare
3	Rare	Rare
4	Occasional	Occasional
5	Common	Frequent
5	Frequent	Frequent
6	Very Frequent	Very Frequent

Double-click on a row to change it.

Custom Map Legend Grid for soil property SDV rule “Flooding Frequency”.

Aggregation Methods – The Details

This section provides a brief description of aggregation in general, and a brief description of every aggregation method. This section also describes the circumstances where an aggregation method is permitted, and describes the circumstances, if any, for which that aggregation method is selected as the default aggregation method. If you want to know the gory details on aggregation, please feel free to request a copy of the functional specifications for the aggregation process from the Soils Hotline at soilshotline@lin.usda.gov.

Aggregation is the process by which a set of component attribute values is reduced to a single value to represent the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some non-soil entity, e.g., rock outcrop. The components in the map unit name represent the major soils within a map unit delineation. Minor components make up the balance of the map unit. Great differences in soil properties can occur between map unit components and within short distances. Minor components may be very different from the major components. Such differences could significantly affect use and management of the map unit. Minor components may or may not be documented in the database. The results of aggregation do not reflect the presence or absence of limitations of the components which are not listed in the database. An on-site investigation is required to identify the location of individual map unit components.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be generated. Aggregation must be done because, on any soil map, map units are delineated but components are not.

Dominant Condition

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group

with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie.

The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

This aggregation method is appropriate for any soil property at the component level or below, or any soil interpretation, and is not appropriate in any other case. This is the default aggregation method for any non-numeric soil property at the component level or below, or any soil interpretation.

Why? When the number of possible result values is limited, the chance that two components of the same map unit might share the same result value is much higher than for a numeric soil property whose values are constrained to a bounded or unbounded continuous range. This aggregation method provides the best possible “expected value” for the map unit as a whole.

Dominant Component

The aggregation method "Dominant Component" returns the attribute value associated with the component with the highest percent composition in the map unit. If more than one component shares the highest percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher attribute value should be returned in the case of a percent composition tie.

The result returned by this aggregation method may or may not represent the dominant condition throughout the map unit.

This aggregation method is appropriate for any soil property at the component level or below, or any soil interpretation, and is not appropriate in any other case. This is the default aggregation method for any numeric soil property at the component level or below.

Why? For a soil property whose values are constrained to a bounded or unbounded continuous range, the chance that two components of the same map unit might share the same result value isn't nearly as high as that of a non-numeric soil property where the number of possible result values is much more limited. Even if we selected “Dominant Condition” as the default aggregation method in this case, in the vast majority of cases, the ultimate value returned would likely correspond to the dominant component, rather than a dominant condition. Therefore we felt that if the result in this case was most likely to correspond to the dominant component, even when the corresponding aggregation method was “Dominant Condition”, we ought to select “Dominant Component” as the default aggregation method to begin with, from a “truth in advertising” perspective.

Most Limiting

The aggregation method "Most Limiting" is suitable only for attributes that correspond to a programmatically generated soil interpretation. Such an interpretation attempts to determine if a soil is suitable for a particular use. The results for such an interpretation can be ranked from least limiting (or most suitable) to most limiting (or least suitable). For this aggregation method, the most limiting result among all components of the map unit is returned.

The result returned by this aggregation method may or may not represent the dominant condition throughout the map unit. The result may well be based on the limitations of a map unit component of very minor extent. If one were making a decision based on this result, that decision would be based on the most conservative, or most pessimistic, result.

The aggregation method is appropriate for limitation and suitability soil interpretations, and is not appropriate in any other case. This aggregation method is never selected as the default aggregation method.

Least Limiting

The aggregation method "Least Limiting" is suitable only for attributes that correspond to a programmatically generated soil interpretation. Such an interpretation attempts to determine if a soil is suitable for a particular use. The results for such an interpretation can be ranked from least limiting (or most suitable) to most limiting (or least suitable). For this aggregation method, the least limiting result among all components of the map unit is returned.

The result returned by this aggregation method may or may not represent the dominant condition throughout the map unit. The result may well be based on the limitations of a map unit component of very minor extent. If one were making a decision based on this result, that decision would be based on the least conservative, or most optimistic, result.

The aggregation method is appropriate for limitation and suitability soil interpretations, and is not appropriate in any other case. This aggregation method is never selected as the default aggregation method.

Weighted Average

The aggregation method "Weighted Average" computes a weighted average value for all components in the map unit. Percent composition is the weighting factor.

The result returned by this aggregation method represents a weighted average value of the corresponding attribute throughout the map unit.

This aggregation method is appropriate for numeric soil properties at the component level or below, and is not appropriate in any other case. This aggregation method is never selected as the default aggregation method.

All Components

The aggregation method "All Components" returns the lowest or highest attribute value among all components of the map unit, depending on the corresponding "tie-break" rule. In this case, the "tie-break" rule indicates whether the lowest or highest value among all components should be returned. For this aggregation method, percent composition ties cannot occur.

The result returned by this aggregation method represents either the minimum or maximum value of the corresponding attribute throughout the map unit. The result may well be based on a map unit component of very minor extent.

This aggregation method is appropriate for any soil property at the component level or below, or any class soil interpretation, and is not appropriate in any other case. This aggregation method is never selected as the default aggregation method.

Absence/Presence

The aggregation method "Absence/Presence" returns a value that indicates if, for all components of a map unit, a condition is always present, never present, partially present, or whether the condition's presence or absence is unknown. The exact phrases used for a particular attribute may vary from what is shown below.

"Always present" means that the corresponding condition is present in all of a map unit's components.

"Never present" means that the corresponding condition is not present in any of a map unit's components.

"Partially present" means that the corresponding condition is present in some but not all of a map unit's components, or that the presence or absence of the corresponding condition cannot be determined for one or more components of the map unit.

"Unknown presence" means that for components where presence or absence can be determined, the corresponding condition is never present, but the presence or absence of the corresponding condition cannot be determined for one or more components.

The result returned by this aggregation method quantifies the degree to which the corresponding condition is present throughout the map unit.

At the time this was written, this is the default and only allowable aggregation method for the hydric rating soil property (component.hydricrating (SSURGO)). At the current time this aggregation method is not appropriate in any other case. At some point in the future we would like to be able to define conditions and generalize this aggregation method so that it could be used for any predefined condition.

No Aggregation Necessary

The majority of soil attributes are associated with a component of a map unit, and such an attribute has to be aggregated to the map unit level before a thematic map can be rendered. Map units, however, also have their own attributes. An attribute of a map unit does not have to be aggregated in order to render a corresponding thematic map. Therefore, the "aggregation method" for any attribute of a map unit is referred to as "No Aggregation Necessary".

This is the default and only allowable aggregation method for soil properties at the map unit level or below, but above the component level, and is not appropriate in any other case.

How the Overall Soil Data Viewer Data Management System Works

Introduction

A number of you may be familiar with how previous versions of the Soil Data Viewer application worked. The SDV rules that drove the application were distributed with the application itself. The SDV rules could reside in a different Access database than the one where the tabular soil data resided. The official SDV rules were maintained by hand. It didn't take very long for a higher end user to figure out how to modify existing SDV rules, or add their own.

Things have changed significantly between Soil Data Viewer 4.x and 5.x.

The SDV rules are no longer distributed with the Soil Data Viewer application. When soil data is exported from the Soil Data Mart, the appropriate corresponding SDV rules are also exported and bundled with that data. When tabular soil data is imported into a SSURGO template database, the corresponding SDV rules are now imported at the same time. The SDV rules must now reside in the same database as the tabular soil data. That is why a new SSURGO template database was released when Soil Data Viewer 5.0 was released. The tables needed to accommodate the SDV rules had to be added to the database.

In previous versions of Soil Data Viewer, all soil interpretation SDV rules were always displayed, regardless of whether or not that corresponding soil interpretation existed in the underlying data. Now when soil tabular data is exported from the Soil Data Mart, only those soil interpretation SDV rules for which the corresponding soil interpretation exists in the data being exported, are included. As before, all soil property SDV rules are always displayed, regardless of whether or not the corresponding soil property is populated in the underlying data.

When SDV rules are imported into a SSURGO template database, a newer version of a given SDV rule will update an older version of that same SDV rule. In other words, the import of SDV rules is an append AND an update operation, whereas the import of soil tabular data is still strictly an append operation.

SDV rules in one SSURGO template database can be imported into a different SSURGO template database.

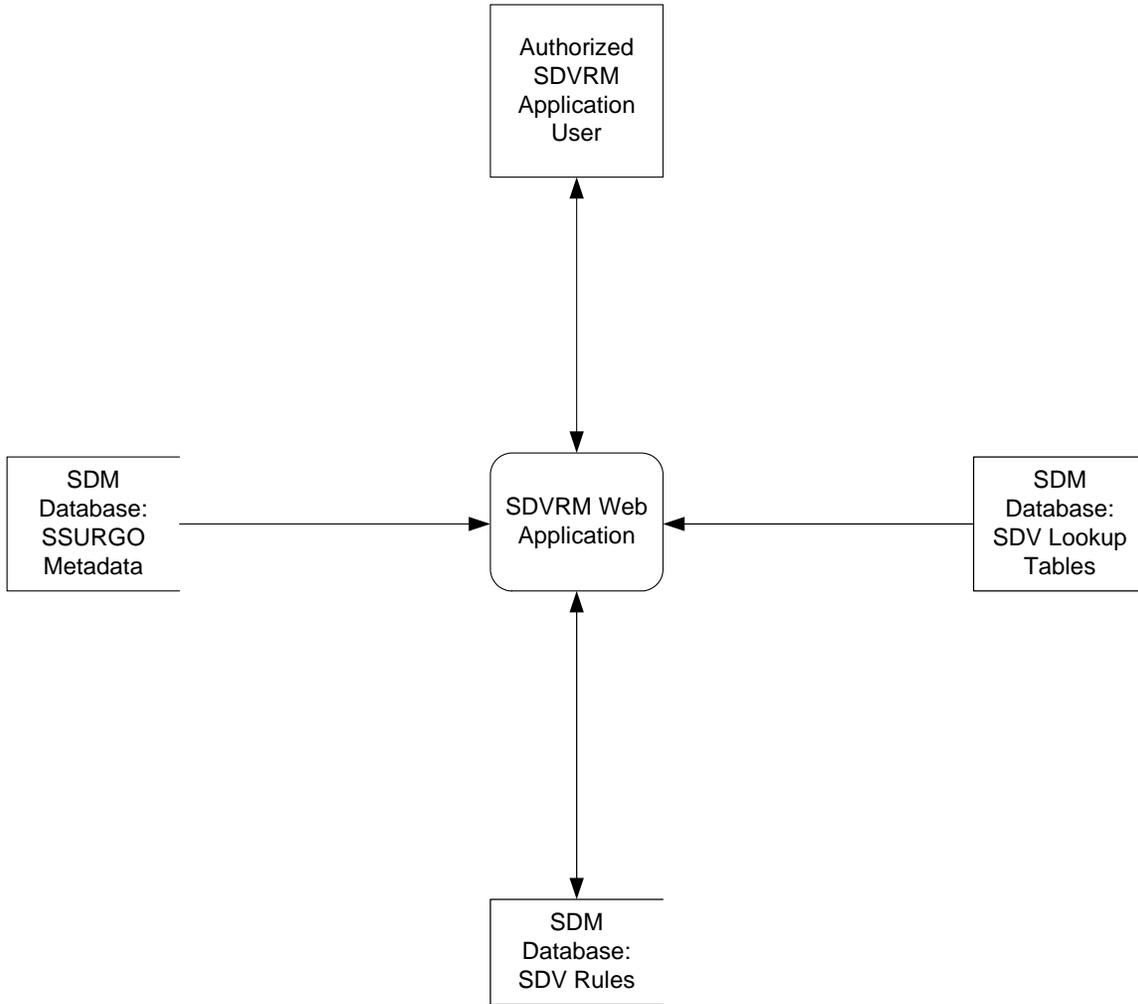
As far as an end user being able to modify an existing SDV rule or add a new SDV rule, users no longer have the freedom they use to have. There are two main reasons for this:

1. The number of fields associated with an SDV rule has increased dramatically, and not every required field is even documented in this User Guide. A person attempting to modify an existing SDV rule or create a new SDV rule from scratch isn't aware of all of the constraints that must be satisfied for an SDV rule to not fail outright.
2. Specifying map legend parameters for ArcGIS is much more complicated than it was for ArcView. Ultimately, these map legend parameters are provide as a set of XML. This map legend XML is required for every SDV rule, and this XML isn't something that an end user is going to be able to create from scratch. The SDV Rule Manager application calls a function to generate this map legend XML, and that function references tables that aren't even available in a SSURGO template database. The best a person could do is to copy a set of map legend XML from an existing SDV rule, and that would only work for SDV rules that don't have or need a custom map legend.

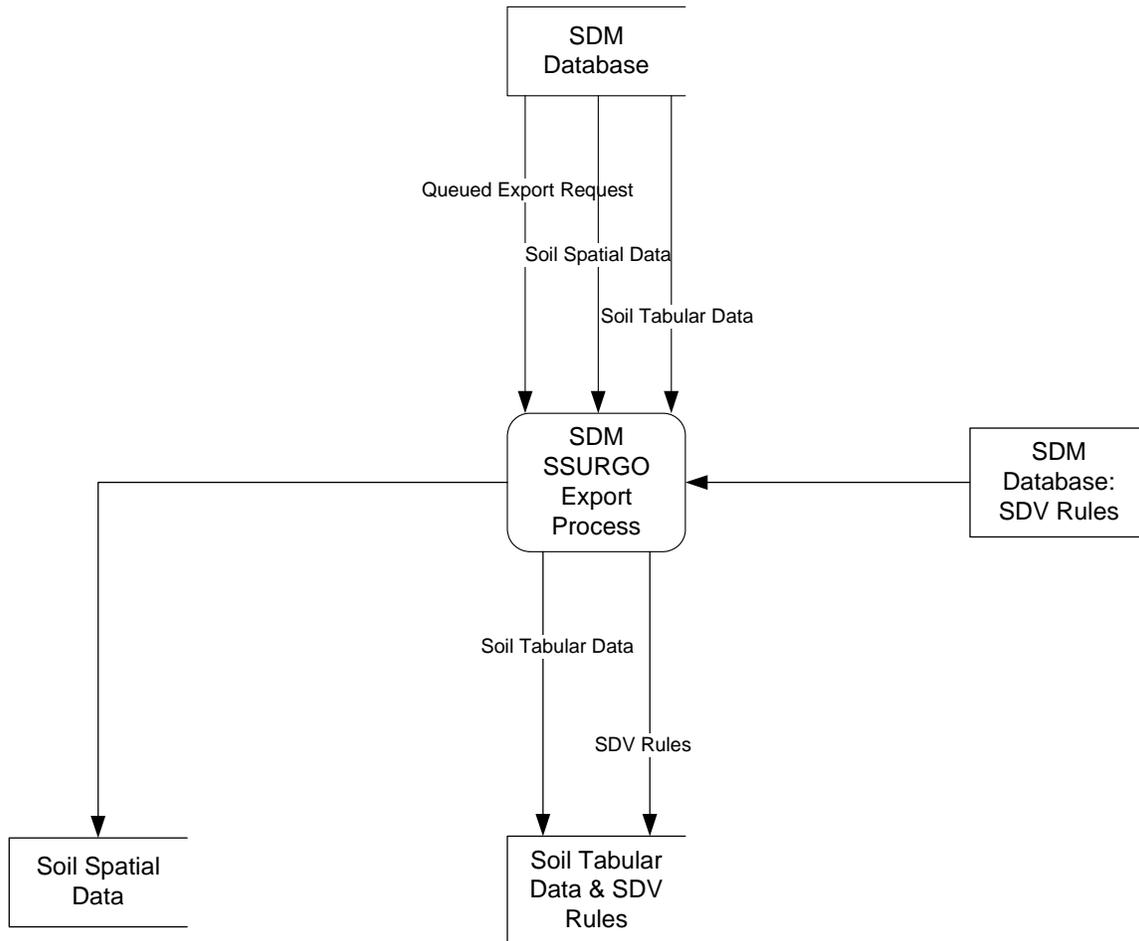
How the current Soil Data Viewer data management system works is illustrated by the following series of data flow diagrams. This discussion assumes that a person is already familiar with how soil tabular and spatial data ultimately makes it way to the Soil Data Mart.

In the following diagrams, where the term "SDV Rules" appears in a data store, keep in mind that "SDV Rules" always includes both SDV rules and folders.

SDV Rule Creation and Maintenance

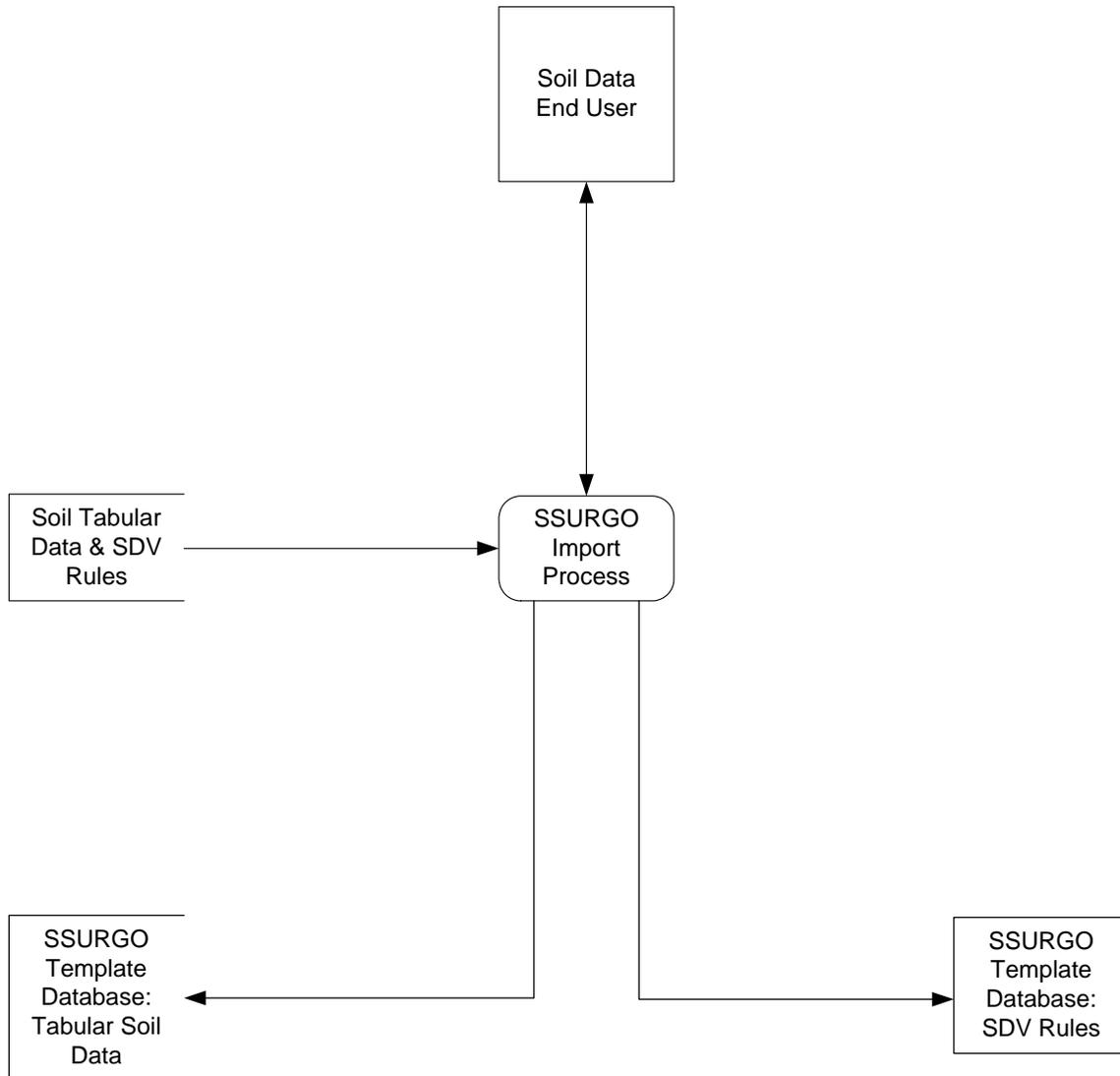


SSURGO Export Generation

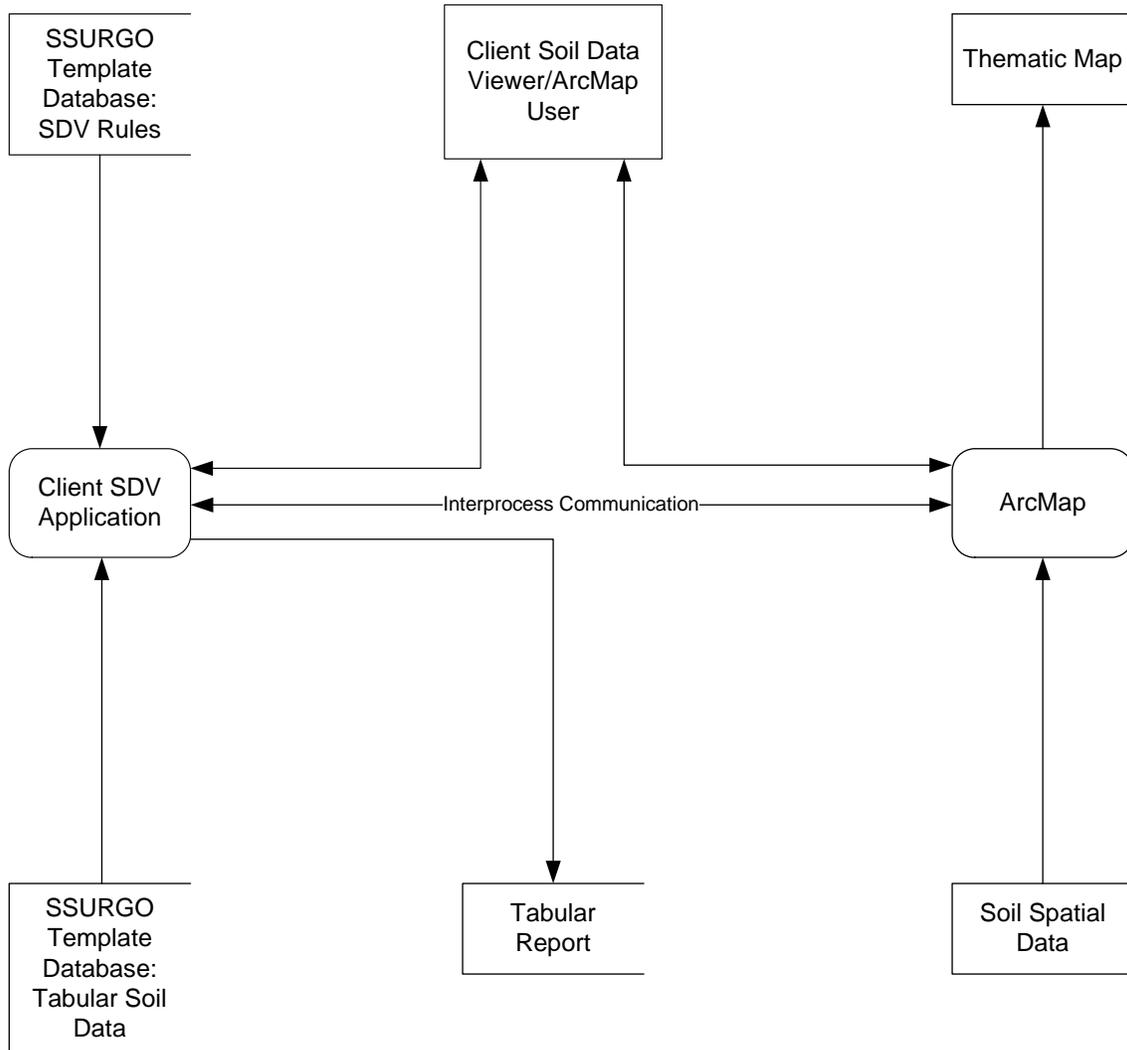


This diagram illustrates a SSURGO export for the Soil Data Mart. One can also export SSURGO data from either NASIS or the Staging Server, and those exports now always include SDV rules. All three SSURGO exports reference the SDV rules stored in the Soil Data Mart database. SSURGO exports from NASIS do not include soil spatial data.

SSURGO Template Database Import



Running Client Soil Data Viewer under ArcMap



When creating thematic maps and aggregation reports via Web Soil Survey, the SDV rules and all soil tabular and spatial data are extracted directly from the Soil Data Mart database, and ArcMap is replaced by ArcGIS Server and ArcIMS.