United States Department of Agriculture

NRCS Natural Resources Conservation Service

USDA

NASIS 6 Pedon

Data Entry Guide

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General Information

NASIS contains five tables that are used to store information collected at specific points and to group the point data for management and analysis purposes. These tables are:

1. Pedon table
2. Site table
3. Site Association table
4. Transect table
5. Vegetation Plot table

These tables record field data collected in the form of profile descriptions, transects, field notes, and selected field-measured properties. Data from pedon descriptions, field notes, and selected field-measured properties are stored in the Pedon and Site tables. The Site Association and Transect tables are used to group and analyze sites and pedons. The Vegetation Plot table is used to store data on plants observed at the site.

This NASIS Pedon Data Entry Guide is designed to provide clear guidance on when and how to populate these four tables. Each table and data field is discussed in the order in which it appears in NASIS.

Point data can be entered directly into NASIS 6, imported from PedonPC, or imported from approved spreadsheets. Importing pedon data is discussed in Chapter 10.

References

Commonly, understanding a NASIS field and how to populate it requires the user to consult National Cooperative Soil Survey guidance documents. Below is a list of the guidance documents referenced in this document. The referenced document is in parentheses at the end of data field descriptions.

- **NSSH** - National Soil Survey Handbook, Title 430-VI. 2012.
- **SSM** - Soil Survey Manual. October, 1993.
- **FBDSS** - Field Book for Describing and Sampling Soils.
- **KST** - Keys to Soil Taxonomy.

All references are available online at http://soils.usda.gov.

Overview of Populating NASIS Pedon and Site Tables

This guidance document includes notes and instructions for almost every field in the NASIS Site, Pedon, Transect, and Site Association tables. **It is not necessary to populate every field. Populate only the fields for which data is available.** Brief guidance on how to populate plant data in the Vegetation Plot table is also provided.

More than a thousand fields need to be considered when entering point data. This can be overwhelming, especially to a new NASIS user. A color-coded system has been designed to assist in deciding which fields need to be populated.

Color-Coded Data Population Guide

GREEN

- Population of the field is always required.

YELLOW:

- Typically populated when entering a full pedon description.
- Populate only if data are available. For example, redoximorphic features are not populated if none were observed in the soil profile.
- Only some of these fields are populated for field notes or partial pedon descriptions.

RED:

- Do not populate.

NO COLOR:

- Optional.
- Populate only if information is available and important.

The purpose for entering a profile description into NASIS is to analyze data. **Enter those profile descriptions that are useful for analysis**. Some profile descriptions may have been described years ago, and complete data is not available. New descriptions should be as complete as possible.

Getting Started – Creating New Site and Pedon Records

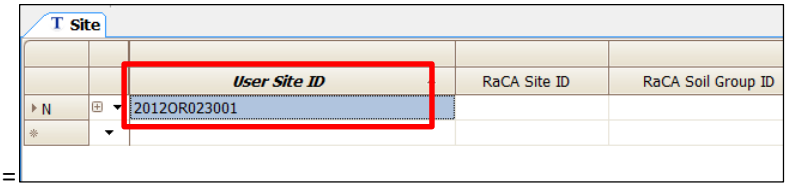
To begin entering a profile description:

1) Establish a site record in the Site table.
2) Record a date in the Site Observation table.

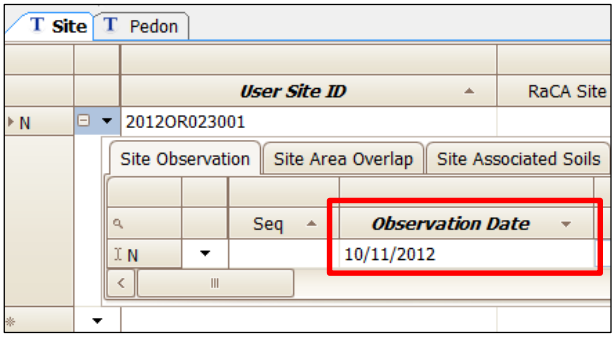
The Site and Site Observation tables must be populated before entering a pedon description or populating plant data in the Vegetation Plot table. The pedon and vegetation plot records are established after the site has been created. They are linked to the appropriate Site and Site Observation table records. These are the minimum steps required for entering a new pedon description into NASIS, but more data needs to be populated in the Vegetation Plot, Pedon, and Site tables. If there is no pedon description associated with the site, the guidance for creating a new pedon record can be ignored. If there is not a list of plants associated with the site, the guidance for creating a new vegetation plot record can be ignored.

Step-By-Step Instructions - Getting Started

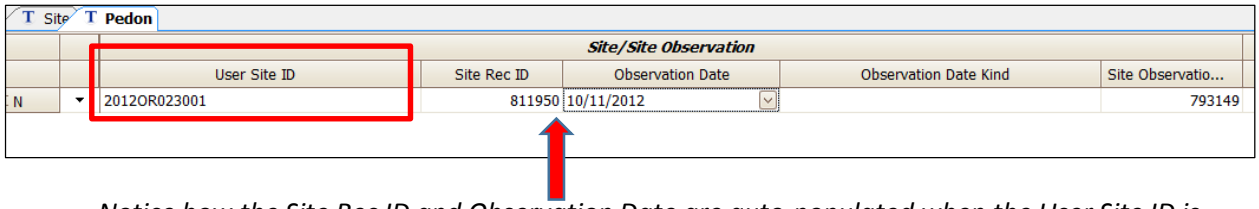
1. Open the Site table > Enter a User Site ID.
    a. The National standard for creating a User Site ID is provided in the **Site Table** section of this guide (click link to jump ahead to section).



2. Open the Site Observation child table > Populate the Observation Date.

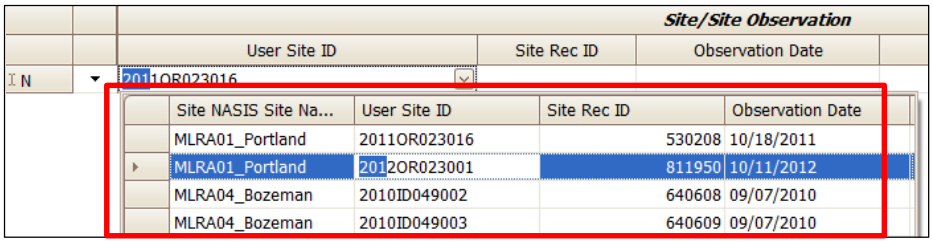


3. Open the Pedon table > Enter the User Site ID created in step 1.

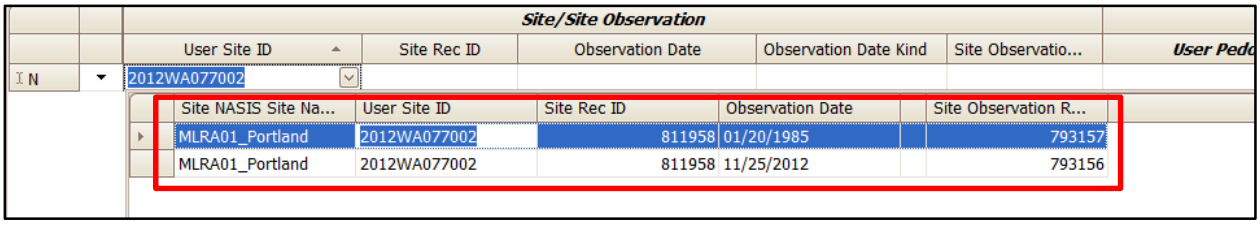


Notice how the Site Rec ID and Observation Date are auto-populated when the User Site ID is entered. This occurs because these two data elements are also in the Site table and are linked to the User Site ID.

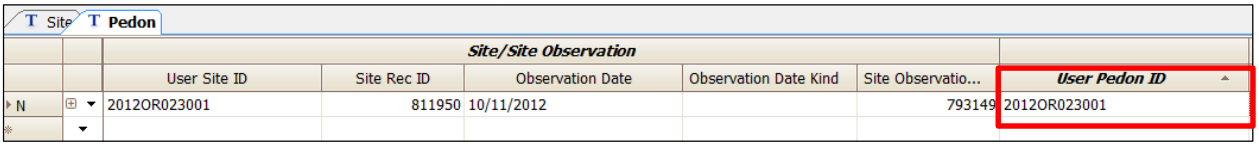
Also, notice that as the User Site ID is typed into the field, a choice list appears. The User Site ID can be selected from the choice list. All site records in the local database are available in this choice list. The list is filtered as the User Site ID is typed into the field.



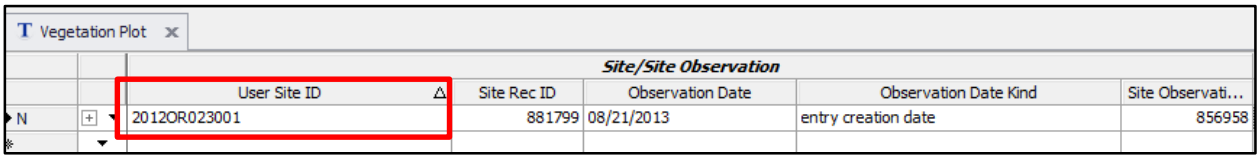
If more than one date is populated in the Site Observation table for a given site, be sure to choose the one that should be linked to the pedon. For example, in the screenshot below, notice that the User Site ID and Site Rec ID are the same, but the Observation Date and Site Observation Rec ID are different. Two records are in the Site Observation table for this site, and either one can be linked to the pedon.



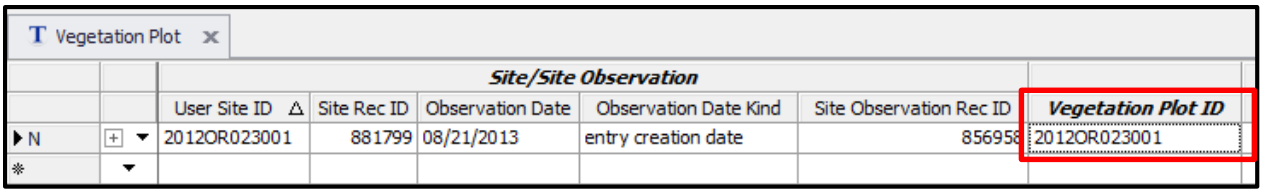
4. Enter a User Pedon ID.
   Guidance for choosing a User Pedon ID is provided in the **Pedon Table** section of this guide, but it is almost always identical to the User Site ID. (Click link to jump ahead to section.)



5. Open the Vegetation Plot table > Enter the User Site ID created in step 1.



6. Enter a Vegetation Plot ID.
   This ID should match the User Site ID.



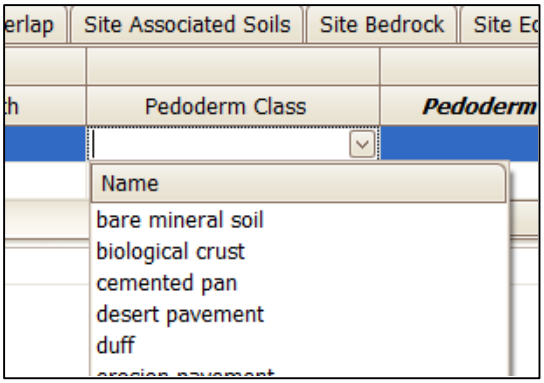
7. Populate the Site, Vegetation Plot, and Pedon tables, using the color-coded system as a guide.

   If the pedon is part of a transect, see the **Transect Table** section of this guide. (Click link to jump ahead to section.)

   If the site is part of a site association, see the **Site Association Table** section of this guide. (Click link to jump ahead to section.)

Choice Lists

Choice lists are provided for many data elements in NASIS. These lists, also known as domains, appear as drop-down menus. See screenshot below for an example.



The definition of a choice may not be obvious. For example, what is the exact definition of a biologic crust Pedoderm Class? Always be sure of the definition before making a selection from the choice list.

The definition is provided:

1. In NASIS – located by using the "view information" tool.

2. In the Domains.pdf document on the NASIS metadata webpage. http://www.nrcs.usda.gov/wps/portal/nrcs/detail//?cid=nrcs142p2_053547

Choice lists can be customized by clicking NASIS > Manage Choice List (default).

NASIS Site, Pedon, Site Association, Transect, and Vegetation Plot Overview

Site

A site is a particular spatial location on the surface of the earth. In some situations, it may have some areal extent beyond the limits of a pedon. A site has a geographic location. Site attributes are those that would be collected regardless of the type of underlying resource (forest, range, soil, crop) inventory data being collected. Some site attributes are considered temporal and others are not, although this is somewhat arbitrary. Site attributes include geographic location, geomorphic setting, climate, existing vegetation, and other non-soil-related attributes.

Data such as soil moisture, soil temperature, and vegetative production may be collected at a particular site at different times. Although the soil at a particular site typically is composed of a single pedon, more than one pedon description from a site can be recorded in the database.

A site may be included in one or more site associations. There is no direct relationship between sites and transects.

Pedon

The definition of a pedon from the Soil Survey Manual (United States Department of Agriculture Handbook No. 18, October, 1993) is as follows:

> *A pedon is regarded as the smallest body of one kind of soil large enough to represent the nature and arrangement of horizons and variability in the other properties that are preserved in samples.*
>
> *A pedon extends down to the lower limit of a soil. It extends through all genetic horizons and, if the genetic horizons are thin, into the upper part of the underlying material. The pedon includes the rooting zone of most native perennial plants. For purposes of most soil surveys, a practical lower limit of the pedon is bedrock or a depth of about 2 meters, whichever is shallower.*
>
> *The surface of a pedon is roughly polygonal and ranges from 1 square meter to 10 square meters in area, depending on the nature of the variability in the soil.*

A pedon record may be a full or partial profile description, or it may be related field measurements, such as particle size, Ksat, or near-surface temporal property measurements (field-measured properties). A pedon is observed and/or described at a particular site or location; therefore, it typically is associated with one site.

A pedon may be included in only one transect. There is no direct relationship between pedons and site associations.

Site Association

A site association is a group of related sites. A site association is established for various reasons. Possible groupings include vegetative study sites, soil moisture or temperature study sites in a particular area, or sites (and their pedons) related to a particular project or a special soil study. A site association is used to manage a group of site records.

A site association is created after the sites are populated. Create the association, and then copy and paste the sites into the Site Association Site table. The site association typically is composed of multiple sites. There is no direct relationship between site associations and pedons or site associations and

transects.

Transect

A transect is a series of profile descriptions (in this case, pedons) from across a landscape used to gather data for a stated purpose, such as map unit composition or diversity. Other types of data collected along transects may also be recorded, such as depth to a particular soil property or feature.

A transect typically is composed of multiple pedons. The Transect table is populated first, and then that record is populated in the Pedon table for each pedon associated with the transect. There is no direct relationship between transects and sites or transects and site associations; however, each pedon in a transect must be directly linked to a site.

Vegetation Plot

A vegetation plot is a record of the kinds and amounts of plants at a site. This was added to NASIS in 2014 for storing the complex ecological site inventory information and lists of plants observed at soil description locations. When entering a soil description or some other non-ecological site inventory information, you will only use the vegetation plot to populate a list of plants in the Plot Plant Inventory table. All other tables can be ignored.

The following information is organized by database object and table. This information is provided as a supplement to the NASIS Help system for additional clarification.

Site

The Site table is intended to record geographic information related to the point where the profile description is taken. The kinds of information stored in this table include:

- Location
- Geomorphology
- Surface morphology
- Water
- Parent material
- Erosion
- Climate
- Associated soils
- Geology
- Vegetation
- Moisture and temperature
- Pedoderm

Location information must be recorded in the Site table. Point data is essentially useless if location information is missing.

Other information about the site that does not tend to change with time may also be recorded in this table. In most cases, there will be a one-to-one relationship between the site record and the pedon record (profile description). The Site table is used to record the location of the pedon. Exceptions to this relationship are:

- Soil samples sent to the KSSL for characterization that include two versions of a pedon linked to one site.
- Sites that are revisited to re-describe a typical description.
- Pedons described within reasonable limits of the GPS accuracy.

1 **User Site ID**

Definition: *A short label to help a user identify a particular site.*

Population Standard: Required

Population Guidance: This field is used to identify each site. The User Site ID has a specific National standard method of population. This field allows the user to place a label on the site to assist with locating the particular site record(s) in the National database. All pedons recorded in NASIS must follow this standard. Typically, the User Pedon ID record is a duplicate of the User Site ID. This standard is referenced in the KSSL Laboratory Information Manual.

The National standard for the User Site ID is the "YYYYXXZZZ123" convention:

- "YYYY" is the 4-digit year when the data or samples were collected.
- "XX" is the 2-character State FIPS code, such as "NE" for Nebraska (for non-USA samples, the code is the abbreviation for the country).
- "ZZZ" is the 3-digit county FIPS code (e.g., 079).
- "123" is the 3-digit consecutive pedon number for that county in that year.

The letter S precedes the User Site ID for soil characterization samples. An example of the User Site ID for a sample location is S2005NE079001.

2 **State Symbol**

Definition: *State where site is located.*

Population Standard: Typically populated

3 **State Name**

Definition: *State where site is located.*

Population Standard: Typically populated

4 **County Symbol**

Definition: *County where site is located.*

Population Standard: Typically populated

5 **County Name**

Definition: *County where site is located.*

Population Standard: Typically populated

6 **MLRA Symbol**

Definition: *MLRA symbol for where site is located.*

Population Standard: Typically populated

7 **MLRA Name**

Definition: *MLRA where site is located.*

Population Standard: Typically populated

Columns 8-22 are for plot information within a site. Originally, most of these columns were used in the Rapid Carbon Assessment initiative but they now can be used to record data from other plot collection studies.

8 **RaCA Site ID**

Definition: *The unique identifier assigned to this site/plot by the project organizers.*

Population Standard: Optional

9 **RaCA Soil Group ID**

Definition: *The identifier assigned to the soil grouping that this site/plot belongs with.*

Population Standard: Optional

10 **DSP Plot ID**

Definition: *The identifier of the dynamic soil property plot; assigned as part of the project plan.*

Population Standard: Optional

11 **Plot Configuration**

Definition: *The arrangement or shape of the sampled plot.*

Population Standard: Optional

12 **Plot Baseline Azimuth** ***(degrees)***

Definition: *The direction in which the baseline of a rectangular plot is oriented.*

Population Standard: Optional

13 **Plot Baseline Length** ***(m)***

Definition: *The length of the baseline of a rectangular plot.*

Population Standard: Optional

14	**Plot Width** *(m)*	Definition: *The width of a rectangular plot.* Population Standard: Optional
15	**Plot Radius** *(m)*	Definition: *The radius of a circular plot.* Population Standard: Optional
16	**Triangle Plot Side Length** *(m)*	Definition: *The length of the side of a triangular plot.* Population Standard: Optional
17	**Chain Plot Max. Width** *(m)*	Definition: *The maximum width of a chain plot.* Population Standard: Optional
18	**Chain Plot Max. Length** *(m)*	Definition: *The maximum length of a chain plot.* Population Standard: Optional
19	**Plot Offset Azimuth** *(degrees)*	Definition: *For a plot that has been moved from its original intended location, the direction from the original point that the center of a circular plot or corner of a rectangular plot is moved.* Population Standard: Optional
20	**Plot Offset Distance** *(m)*	Definition: *For a plot that has been moved from its original intended location, the distance from the original point that the new center of a circular plot or corner of a rectangular plot is moved.* Population Standard: Optional
21	**Plot/Site Set Up By**	Definition: *The name of the person(s) that set up the plot and laid out its sampling arrangement. Enter complete first and last name; do not use initials.* Population Standard: Optional
22	**Plot Recorder**	Definition: *The name of the person(s) that recorded information pertaining to this plot. Enter complete first and last name; do not use initials.* Population Standard: Optional

Site location columns 23-40 are available for use; however, columns 41 and 42 must be populated with the Nationally required standard latitude and longitude in decimal degrees, datum WGS84.

Latitude and longitude in degrees, minutes, and seconds and UTMs can be recorded in various datums, whereas the standard latitude and longitude in decimal degrees is always recorded in the WGS84 datum. The datum name column (31) only applies to columns 23-30 and 33-34 (latitude and longitude in degrees, minutes, and seconds and UTMs). It is essential to know the datum used when populating coordinate pairs.

Refer to Appendix D: Populating Coordinate Pairs in the NASIS Site Table for more information on populating coordinate pairs, coordinate pair metadata, auto-populating coordinates into NASIS, and calculating coordinates in ArcGIS.

23 **Lat. Degrees**

Definition: *Latitude in degrees.*

Population Standard: Optional

24 **Lat. Minutes**

Definition: *Latitude in minutes.*

Population Standard: Optional

25 **Lat. Seconds**

Definition: *Latitude in seconds and decimal seconds.*

Population Standard: Optional

26 **Lat. Direction**

Definition: *Latitude position north or south of the equator.*

Population Standard: Optional

27 **Long. Degrees**

Definition: *Longitude in degrees.*

Population Standard: Optional

28 **Long. Minutes**

Definition: *Longitude in minutes.*

Population Standard: Optional

29 **Long. Seconds**

Definition: *Latitude in seconds and decimal seconds.*

Population Standard: Optional

30 **Long. Direction**

Definition: *Longitude east or west of Greenwich (the Prime Meridian or origin).*

Population Standard: Optional

31 **Datum Name**

Definition: *The identification given to the reference system used for defining the coordinates of points. (Content Standards for Spatial Metadata, FGDC, 3/31/94 draft).* ***This entry applies to both lat/long and UTM coordinates.***

Population Standard: Optional

Population Guidance: Required if fields 17-24 and/or fields 32-34 are populated. The datum name is the identification given to the reference system used for defining the coordinates of points. **This entry applies to both latitude and longitude in degrees, minutes, and seconds and UTM coordinates. This entry DOES NOT apply to the Std Latitude and Std Longitude fields (78 and 79), as they are always in WGS84 datum.**

32 **Location Description**

Definition: *A description of the geographic location in terms other than from a location system. This may include reference to cultural or natural features or other features that can only be identified by visiting the location.*

Population Standard: Optional

Population Guidance: This field has lost relevance due to the universal use of GPS. Typically, it would only be populated if entering old OSDs, TUDs, or pedon descriptions that used a narrative to describe the location of the pedon. It typically has been used in 'metes and bounds' areas. The location description refers to cultural or natural features or other features that can only be identified by visiting the location. The location description includes a carefully described point of beginning and then the direction and distance for each turn to the location of the pedon.

Columns 33-37 pertain to the Public Land Survey System (PLSS).

Before the use of GPS devices became commonplace, the location of pedons were identified with PLSS information or other narrative location descriptions. The location of older pedons for taxonomic unit descriptions (TUDs) in soil survey manuscripts and official series descriptions (OSDs) and other older pedons is typically identified by one of these methods. If a coordinate pair is populated for an older pedon, it most likely was estimated from the PLSS details or another narrative location description.

The PLSS is not used throughout the entire United States; however, it does cover 1.5 billion acres and encompasses major portions of 30 states.

33 **PLSS Section Details** ***(m)***

Definition: *Details about the location within the specified section to locate the site. ased on a reference to one of the corners of the section, and distance and direction to locate the site within the section. (Man. of Instr. for Survey of Public Lands of US, 1947).*

Population Standard: Optional

Population Guidance: The details about the location of a site within a PLSS section. Two methods are used.

1. Distance and direction from the corner of a section. For example, 100 meters north and 300 meters west of the SE corner of section 31.
2. Quarter section(s), with the first quarter section indicating the smallest subdivision and the last quarter section indicating the largest subdivision. For example, ¼ SE, ¼ NW, ¼ SW.

34 **PLSS Section**

Definition: *The numeric identifier of a subdivision of a township quadrangle, normally 1 square mile with 36 sections per township (Man. of Instr. For Survey of Public Lands of US, 1947).*

Population Standard: Optional

35 **PLSS Township**

Definition: *The unit of survey, normally a quadrangle 6 miles on a side. When used in conjunction with "range" to indicate the coordinates of a particular township quadrangle. (Man. of Instr. for Survey of Public Lands of US, 1947).*

Population Standard: Optional

Population Guidance: Must enter a number and letter, such as 15S.

36 **PLSS Range**

Definition: *The reference to a township quadrangle, when used in conjunction with township. (Man. of Instr. for Survey of Public Lands of US, 1947)*

Population Standard: Optional

Population Guidance: Must enter a number and letter, such as 3E.

37 **PLSS Meridian**

Definition: *The designated identifier of a line along an astronomical meridian that establishes the reference for township boundaries. This is part of the Public Land Survey System (PLSS) which includes meridian, township, range, and section. (Man. of Instr. for Survey of Public Lands of US, 1947.))*

Population Standard: Optional

38 **UTM Zone**

Definition: *Zones of the Universal Transverse Mercator projection system bounded by meridians, the longitudes are multiples of 6 degrees. Zones are numbered from 1 to 60 proceeding east from the 180th meridian from Greenwich, England.*

Population Standard: Optional

39 **UTM Northing**

(m)

Definition: *The distance, in meters, north from the UTM zone origin. For "north", origin is the equator equal zero. For the southern hemisphere it is a false northing with origin, i.e. the equator, equal to 10,000,000 meters.*

Population Standard: Optional

40 **UTM Easting**

(m)

Definition: *The distance, in meters, proceeding east for the UTM zone. The UTM zone central meridian is the origin and is designated a value of 500,000 meters, creating a "false" easting.*

Population Standard: Optional

Fields 78 and 79 are the National standard for the location of a pedon. Refer to **Appendix D: Populating Coordinate Pairs in the NASIS Site Table** for more detailed guidance. Data for these columns can be calculated from latitude and longitude in degrees, minutes, and seconds only if they are WGS84 coordinates. The calculation is called "Convert WGS84 Latitude/Longitude to Decimal Degrees," and it is in the site folder.

41 **Std Latitude**

(decimal degrees)

Definition: *Standardized latitude value in decimal degrees, in geographic coordinate system, WGS84 datum. Values are either auto-populated from GPS, or computed from original latitude coordinates using standard conversion algorithms.*

Population Standard: Required

Population Guidance: ONLY ENTER DATA IN DECIMAL DEGREES, WGS84. This field can be auto-populated using the Import GPS Site Data tool, and it can be calculated from longitude/latitude in WGS84.

This is the USDA-NRCS Standard for storing point data.

42 **Std Longitude**

(decimal degrees)

Definition: *Standardized longitude value in decimal degrees, in geographic coordinate system, WGS84 datum. Values are either auto-populated from GPS, or computed from original longitude coordinates using standard conversion algorithms.*

Population Standard: Required

Population Guidance: ONLY ENTER DATA IN DECIMAL DEGREES, WGS84. This field can be auto-populated using the Import GPS Site Data tool, and it can be calculated from longitude/latitude in WGS84.

NEGATIVE FOR ALL POINTS IN NORTH AMERICA, except for points at the westernmost part of the Aleutian Islands.

This is the USDA-NRCS Standard for storing point data.

43	**Coordinate Source**	Definition: *The method or source used to acquire the original geographic coordinates identified for the site.* Population Standard: Required Population Guidance: **This field provides information that refers only to Std. Latitude and Std. Longitude (fields 78 and 79).**
44	**Elevation** ***(m)***	Definition: *The vertical distance from mean sea level to a point on the earth's surface.* Population Standard: Typically populated

Populate only one of the following four Geomorphic Component columns (45-48).

45	**Geomorphic Component - Hills**	Definition: *A mappable part of the earth's surface (three-dimensional) that represents an episode of landscape development of hills.* Population Standard: Typically populated
46	**Geomorphic Component - Mountains**	Definition: *A mappable part of the earth's surface (three-dimensional) that represents an episode of landscape development of mountains.* Population Standard: Typically populated
47	**Geomorphic Component - Terraces**	Definition: *A mappable part of the earth's surface (three-dimensional) that represents an episode of landscape development of terraces.* Population Standard: Typically populated
48	**Geomorphic Component - Flats**	Definition: *Description of the geomorphic component for flats.* Population Standard: Typically populated
49	**Hillslope Profile**	Definition: *Two-dimensional slope segments of a hillslope that have similar geometric, erosional, or depositional characteristics.* Population Standard: Typically populated
50	**Slope Position**	Definition: *Position of the pedon site within the segment of the slope.* Population Standard: Optional
51	**Slope Gradient** ***(%)***	Definition: *The difference in elevation between two points, expressed as a percentage of the distance between those points. (SSM)* Population Standard: Typically populated
52	**Aspect** ***(degrees)***	Definition: *The direction toward which the surface of the soil faces, expressed as an angle between 0 and 360 degrees measured clockwise from true north* Population Standard: Typically populated

53 **Slope Length USLE** *(m)*

Definition: *The distance from the point of origin of overland flow to the point where either the slope gradient decreases enough that deposition begins or the runoff water enters a well-defined channel that may be part of a drainage network or a constructed channel. (Predicting Rainfall Erosion Losses a Guide to Conservation Planning, Agr. Handbook #537, USDA, 1978).*

Population Standard: Optional

54 **Upslope Length** *(m)*

Definition: *The length of slope that contributes water to a site or point. (SSM)*

Population Standard: Optional

55 **Slope Shape Across**

Definition: *The geometric, two-dimensional profile (shape) of the slope parallel to elevation contours.*

Population Standard: Typically populated

56 **Slope Shape Up/Down**

Definition: *The geometric, two-dimensional profile (shape) of the slope perpendicular to elevation contours.*

Population Standard: Typically populated

57 **Slope Complexity**

Definition: *The identification of whether the landscape surface is simple or complex.*

Population Standard: Typically populated

58 **Local Physiographic Name**

Definition: *A name used locally to identify physiographic features. These may be names found of USGS Topographic Quadrangles, i.e. Bob's Hill.*

Population Standard: Optional

59 **Drainage Class**

Definition: *the natural drainage conditions of the soil and refers to the frequency and duration of wet periods. An example of a drainage class is well drained.*

Population Standard: Typically populated

60 **Ksat Class Upper**

Definition: *The saturated hydraulic conductivity (Ksat) class assigned to the upper part of the soil profile, or the whole profile is no strongly contrasting classes occur within the profile depth.*

Population Standard: Typically populated

61 **Ksat Class Lower**

Definition: *The saturated hydraulic conductivity (Ksat) class assigned to the lower part of the soil profile when strongly contrasting classes occur within the profile depth.*

Population Standard: Typically populated

62 **Site Permeability - obsolete**

Definition: *The saturated hydraulic conductivity (Ksat) class assigned to the lower part of the soil profile when strongly contrasting classes occur within the profile depth.*

Population Standard: Do not populate

63 **Local Runoff Class**

Definition: *Runoff potential class for the soil, assigned based on local/state/MLRA criteria.*

Population Standard: Optional

64 **Drainage Pattern**

Definition: *The configuration or arrangement, in plan view, of the stream courses in an area, including gullies or first-order areas of channelized flow, tributaries, and main streams. It is related to local geologic materials, geomorphologic features, and geomorphic history of the area; major drainage pattern types include dendritic, trellis, artificial, etc. Also called drainage network.*

Population Standard: Optional

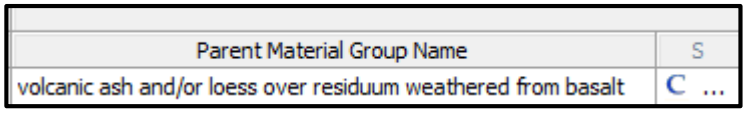
65 **Parent Material Group Name**

Definition: *Name for the concatenation of PARENT_MATERIAL_MODIFIER, PARENT_MATERIAL_KIND, and PARENT_MATERIAL_ORIGIN for each of the parent materials that may occur in a vertical cross-section of a soil.*

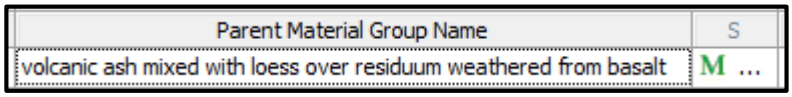
Population Standard: Typically Populated

Calculation: Site Parent Material

Population Guidance: This typically is a calculated field, but it may also be entered or edited manually. Often, the calculated parent material needs to be adjusted in order to clean up the language. For example, if a soil has volcanic ash mixed with loess over residuum weathered from basalt, it may calculate as:



You can edit the groupname so it says:



To calculate:

1. Populate the Site Parent Material child table.
2. Run the "Site Parent Material" calculation.

The **Site Parent Material Table** is discussed later in this document. If the calculation does not produce a logical parent material group name, adjust as needed.

Climate information (columns 66-77) can be obtained from the National Water and Climate Center http://www.wcc.nrcs.usda.gov/climate/climate-map.html or other local climate stations (http://lwf.ncdc.noaa.gov/oa/climate/stationlocator.html). All data are recorded over the standard "normal" period, the most recent 30-year period.

66 **Climate Station ID**

Definition: *The station identifier assigned by the responsible agency. This uniquely identifies a climate station.*

Population Standard: Optional

Population Guidance: Freeform field note. Weather station IDs can be obtained from the National Water and Climate Center website (http://www.wcc.nrcs.usda.gov/) or other NOAA-approved websites.

67 **Climate Station Name**

Definition: *The full descriptive name of the station as recognized by the agency responsible for the station.*

Population Standard: Optional

Population Guidance: Freeform field note. Weather station names can be obtained from the National Water and Climate Center website (http://www.wcc.nrcs.usda.gov/) or other NOAA-approved websites.

68 **Climate Station Type**

Definition: *The type of the weather station, U.S. Official or Other.*

Population Standard: Optional

Population Guidance: Freeform field note. Enter the owner of the weather station identified in the climate station report. Online at http://lwf.ncdc.noaa.gov/oa/climate/stationlocator.html or in the following table.

Type	Description	Number of Stations	Find
NWS COOP	NWS Cooperative Network	> 32,000	Go
GHCN-D	Global Historical Climatology Network - Daily	> 70,000	Go
ASOS	Automated Surface Observing System	> 900	Go
LCD	Local Climatological Data (First Order)	274	Go
USCRN	U.S. Climate Reference Network	> 120	Go
USRCRN	U.S. Regional Climate Reference Network	> 60	Go
AL USRCRN	Alabama U.S. Regional Climate Reference Network	> 15	Go
USHCN	U.S. Historical Climatological Network	1,218	
NEXRAD	NEXRAD Radar	> 150	Go
AWOS	Automated Weather Observing System	> 700	Go
Upper Air	IGRA v2	Pending	Go
International	Other International not included above	Pending	
Other	Various Military, Weather Service, Airways, etc.	> 3,000	

69 **Frost Free Days**

Definition: *The expected number of days between the last freezing temperature (0 degrees C) in spring (Jan-Jul) and the first freezing temperature (0 degrees C) in fall (Aug-Dec). The number of days is based on the probability that the values for the standard "normal" period will be exceeded in 5 years out of 10.*

Population Standard: Optional

70 **MAP**
(mm)

Definition: *Mean Annual Precipitation. The arithmetic average of the total annual (liquid) precipitation taken over the standard "normal" period, 1961-1990.*

Population Standard: Optional

71 **REAP**
(mm)

Definition: *Relative annual precipitation. An estimate of the amount of moisture available for plant use and/or soil-forming processes at a given site. It may vary, plus or minus, from the "actual" precipitation amount as a result of runon, runoff, temperature, aspect, etc.*

Population Standard: Optional

72 **MAAT**
(°C)

Definition: *Mean annual air temperature. The arithmetic average of the daily maximum and minimum temperatures for a calendar year.*

Population Standard: Optional

73 **MAST**
(°C)

Definition: *Mean annual soil temperature. Measured at a depth of 50 cm below the soil surface or at the upper boundary of a root-limiting layer as defined in Soil Taxonomy, whichever is shallower.*

Population Standard: Optional

74 **MSAT**
(°C)

Definition: *Mean summer air temperature. The mean of the June, July, and August mean air temperatures in the northern hemisphere.*

Population Standard: Optional

75 **MSST**
(°C)

Definition: *Mean summer soil temperature. The mean of the June, July, and August mean soil temperatures in the northern hemisphere at a depth of 50 cm below the soil surface or at the upper boundary of a root-limiting layer as defined in Soil Taxonomy, whichever is shallower.*

Population Standard: Optional

76 **MWAT** *(°C)*

Definition: *Mean winter air temperature. The mean of the December, January, and February mean air temperatures in the northern hemisphere.*

Population Standard: Optional

77 **MWST** *(°C)*

Definition: *Mean winter soil temperature. The mean of the December, January, and February mean soil temperatures in the northern hemisphere at a depth of 50 cm below the soil surface or at the upper boundary of a root-limiting layer as defined in Soil Taxonomy, whichever is shallower.*

Population Standard: Optional

78 **Benchmark Soil?**

Definition: *An indicator as to whether this site is on a benchmark soil.*

Population Standard: Optional

79 **Flooding Frequency**

Definition: *The annual probability of a flood event, expressed as a class. (SSM).*

Population Standard: Optional

80 **Flooding Duration**

Definition: *Average duration of inundation per flood occurrence and expressed as a class. (NSSH)*

Population Standard: Optional

81 **Flooding Month**

Definition: *The month of the year in which the predicted flooding period of a soil is likely to begin.*

Population Standard: Optional

82 **Ponding Frequency**

Definition: *The number of times ponding occurs over a period of time. (SSM)*

Population Standard: Optional

83 **Ponding Duration**

Definition: *The average duration, or length of time, of the ponding occurrence. (NSSH).*

Population Standard: Optional

84 **Ponding Month**

Definition: *The month of the year in which the predicted flooding period of a soil is likely to begin.*

Population Standard: Optional

85 **Wet Soil Moisture Duration** *(days)*

Definition: *The cumulative annual duration (time) that a water table can be expected to exist in the soil, measured in days.*

Population Standard: Optional

Columns 86 and 87 store metadata on the Std. Longitude and Std. Latitude coordinates. The data does not refer to UTM coordinates or longitude/latitude in degrees, minutes, and seconds. Refer to Appendix D: Populating Coordinate Pairs in the NASIS Site Table for more information on populating coordinate pairs, coordinate pair metadata, auto-populating coordinates into NASIS, and calculating coordinates in ArcGIS.

86 **GPS - Positional Error**

(m)

Definition: *The potential distance between the GPS coordinate location and the "true" location of a point observation. The "true" location of the point observation usually is within the area covered by a circle centered on the GPS coordinate location with a radius equal to the positional error.*

Population Standard: Optional

87 **GPS – PDOP**

Definition: *Position (3D) dilution of precision - a term used in geomatics engineering to describe the geometric strength of satellite configuration. A low PDOP value represents a better GPS positional accuracy due to the wider angular separation between the satellites used to calculate a GPS unit's position. The value is acquired from the GPS unit.*

Population Standard: Optional

88 **Corrected Elevation**

(m)

Definition: *The corrected (post-processed) vertical distance from mean sea level to a point on the earth's surface obtained by inputting the GPS coordinates for the location into a web application (such as the one online at http://www.gpsvisualizer.com/elevation), which then returns the actual elevation for the coordinate point. The accuracy of the value returned is dependent upon the accuracy and precision of the coordinate point values provided.*

Population Standard: Optional

89 **Cowardin Wetland System**

Definition: *The Cowardin Wetland Classification system is a multi-level hierarchical classification system. "System" is the top level of the hierarchy. Reference: http://www.npwrc.usgs.gov/resource/wetlands/classwet/class.htm*

Population Standard: Optional

90 **Cowardin Wetland Subsystem**

Definition: *The Cowardin Wetland Classification system is a multi-level hierarchical classification system. "Subsystem" is the second level of the hierarchy. Reference: http://www.npwrc.usgs.gov/resource/wetlands/classwet/class.htm*

Population Standard: Optional

91 **Cowardin Wetland Class**

Definition: *The Cowardin Wetland Classification system is a multi-level hierarchical classification system. "Subsystem" is the third level of the hierarchy. Reference: http://www.npwrc.usgs.gov/resource/wetlands/classwet/class.htm*

Population Standard: Optional

92 **Cowardin Wetland Subclass**

Definition: *The Cowardin Wetland Classification system is a multi-level hierarchical classification system. "Subclass" is the fourth level of the hierarchy. Reference: http://www.npwrc.usgs.gov/resource/wetlands/classwet/class.htm*

Population Standard: Optional

93 **HGM Class**

Definition: *The top level of the Hydrogeomorphic Wetland Classification System.*

Population Standard: Optional

94 **HGM Subclass**

Definition: *The second level of the Hydrogeomorphic Wetland Classification System. The terms used for subclasses are developed at a region or local level.*

Population Standard: Optional

95 **HGM Modifier**

Definition: *A regional or locally determined modifier term that is applied to the HGM Subclass as part of the Hydrogeomorphic Wetland Classification System.*

Population Standard: Optional

96 **Legacy Ecol. Site ID**

Definition: *The identifying code of an ecological site converted from legacy data that could not be converted to a current official ecologcial site ID.*

Population Standard: Optional

97 **Legacy Ecol. Site Name**

Definition: *The identifying code of an ecological site converted from legacy data that could not be converted to a current official ecologcial site name.*

Population Standard: Optional

98 **MFFP**

(mm)

Definition: *The long-term average precipitation received during the frost-free period of the year.*

Population Standard: Optional

99 **PE Index**

Definition: *A number designating the Thornthwaites precipitation-evaporation index (i.e., ratio of precipitation to evapotranspiration) for the area, as derived from SCS drawing number 5S-16, 270.*

Population Standard: Optional

100 **Plot Estab. Year**

Definition: *The year that the plot was first visited and established.*

Population Standard: Optional

101 **Plot #**

Definition: *The sequential number of the plot. Numbers are padded with leading zeros to create a 3-digit number.*

Population Standard: Optional

Site Observation

A site can be visited more than once. Some features at a site are static, and others are dynamic. The Site Observation table is designed to record the dynamic features. In other words, it is used to record data about features that can change between visits to a site. Specifically, it stores information such as the date data was collected, surface conditions, weather, salinity, pH, dissolved oxygen, erosion, temperature, hydrology, moisture, anaerobic conditions, and vegetation. There will be only one record for the date a pedon is described, as the soil profile typically is considered to be a static feature. However, if other site features are recorded, such as soil temperature or soil moisture, there will be a record for each time the data is collected. In NASIS 6.2, the amount of data that can be recorded in the Site Observation table is significantly increased.

The Site Observation table links a site to the Pedon table and Vegetation Plot table.

1 **Observation Date**

Definition: *The date on which this particular soil was described or entered into NASIS, expressed as month, day, year -- MM/DD/YYYY.*

Population Standard: Required

Population Guidance: The observation date is defined by the Observation Date Kind.

2 **Observation Date Kind**

Definition: *Indicates whether the date associated with a site observation is the actual date of observation, or something else.*

Population Standard: Required

Population Guidance: Refers to the Observation Date field.

3 **Data Collector**

Definition: *The name of the person collecting the measurements or observations.*

Population Standard: Required

Population Guidance: Enter complete first and last name; do not use initials.

Project Name

Definition: *Name of the project linked to the site.*

Population Standard: Optional

5 **User Project ID**

Definition: *The project ID of the project linked to the site.*

Population Standard: Optional

6 **Air Photo ID**

Definition: *Identification (number) of photograph where site is located.*

Population Standard: Optional

7 **Surface Water Kind**

Definition: *The type (source) of water observed on the soil surface.*

Population Standard: Optional

8 **Surface Water Depth** ***(cm)***

Definition: *The observed depth of water on the soil surface.*

Population Standard: Optional

9 **Hydrology Status**

Definition: *An indicator of whether or not the natural hydrology of the soil has been significantly modified by human activity.*

Population Standard: Optional

10 **Microrelief Kind**

Definition: *The kind of slight variations in the height of a land surface that are too small or intricate to delineate on a topographic or soils map at commonly used scales (1:24000, and 1:10000).*

Population Standard: Optional

11 **Microrelief Elevation** ***(cm)***

Definition: *The vertical elevation difference of the microrelief.*

Population Standard: Optional

12 **Microrelief Pattern (obsolete)**

Definition: *The surficial pattern of the microrelief feature.*

Population Standard: Do not populate

Columns 13-16 refer to states and community phases of ecological sites. Not all ecological site descriptions contain this information, but inclusion of this information is desirable.

13 **Ecol. State ID**

Definition: *The assigned identifier code of the state within the ecological site on which a site or plot is located.*

Population Standard: Optional

14 **Ecol. State Name**

Definition: *The assigned name of the state within the ecological site on which a site or plot is located.*

Population Standard: Optional

15 **Comm. Phase ID**

Definition: *The assigned identifier code of the community phase of the ecological site on which a site or plot is located.*

Population Standard: Optional

16 **Comm. Phase Name**

Definition: *The assigned name of the community phase of the ecological site on which a site or plot is located.*

Population Standard: Optional

17 **Plant Association Name**

Definition: *The name assigned to a particular plant community found at a particular location. A plant association is a kind of plant community represented by a high degree of floristic uniformity in all layers. Plant Associations are identified and named for the dominant plant species in a layer. (Nat. Soil-Range Team, 1988, Instr. for Completing the Stand. Site Descrip.)*

Population Standard: Optional

18 **Cover Kind 1**

Definition: *The natural or artificial material that is observed to cover a portion of the earth's surface. It is determined (at least conceptually) as a vertical projection downward. Level one of a hierarchical system. (1992 NRI Instructions)*

Population Standard: Optional

19 **Cover Kind 2**

Definition: *The description of ground cover based on a set of vegetal and non-vegetal classes. It is determined (at least conceptually) as a vertical projection downward. Level two of a hierarchical system.*

Population Standard: Optional

Populate columns 20-28 only for sites in arid climates. A pedoderm is defined as the soil-air interface. It is the “skin” of the soil. Columns 20-28 pertain to the pedoderm and are used to describe the surface of sites in arid climates. Refer to the Field Guide for Pedoderm and Pattern Classes for detailed guidance
http://jornada.nmsu.edu/sites/default/files/FieldGuidePedodermPattern.pdf

20 **Res. Retention Class**

Definition: *A description of the size and connectivity of persistent vascular plant patches and interpatch areas across a plot. The features of each class value reflect the ability of the persistent plant community to retain water, nutrients, soil, and other resources (litter, seeds). These resources have a greater potential to be retained at lower class values.*

Population Standard: Optional

21 **Bare Area Max. Width** *(cm)*

Definition: *The maximum width of bare areas; a dimension reported with the associated resource retention class.*

Population Standard: Optional

22 **Pedoderm Class**

Definition: *A description of the type of material that occurs at the air/soil interface.*

Population Standard: Optional

23 **Pedoderm Loose Cover Indicator**

Definition: *An indicator of the presence of loose mineral soil material overlying a pedoderm.*

Population Standard: Optional

24 **Biol. Crust Type Dominant**

Definition: *The dominant type of biological crust observed.*

Population Standard: Optional

25 **Biol. Crust Type Secondary**

Definition: *The secondary type of biological crust observed.*

Population Standard: Optional

26 **Phys Crust Subtype**

Definition: *A subcategory of physical crust pedoderm class denoting the primary mechanism involved in their formation.*

Population Standard: Optional

27 **Crust Dev Class**

Definition: *An expression of the strength or degree of development of the crust being described.*

Population Standard: Optional

28 **Soil Redistribution Class**

Definition: *A description of the extent and severity of soil redistribution processes (erosion and deposition by wind and water) across a plot. Redistribution processes are indicated by multiple features that include, but are not limited to, pedestals, water flow patterns, depositional mounds and carbonate coats or soil lines on rock fragments. The features of each class influence the ability of the soil to support plant communities and other functions. The extent and severity of soil redistribution and its effects on plants are greater at higher class values.*

Population Standard: Optional

29 **Exposed Soil Percent** *(%)*

Definition: *The percentage of the soil surface within the plot that is exposed, bare soil (not rock or vegetation covered soil).*

Population Standard: Optional

30 **Local Disturb. Distance** *(m)*

Definition: *The distance from the site or plot to any local disturbance that would influence soil properties (e.g., stock processing enclosure, construction excavation site).*

Population Standard: Optional

31 **Local Disturb. Description**

Definition: *A description of the local disturbance identified.*

Population Standard: Optional

32 **Drained?**

Definition: *An indicator as to whether the land where this site occurs has been drained.*

Population Standard: Optional

33 **Bedded Soil?**

Definition: *An indicator as to whether the land surface where this site occurs has been bedded for drainage purposes.*

Population Standard: Optional

34 **Forest Plantation?**

Definition: *An indicator as to whether this site occurs within a forest plantation.*

Population Standard: Optional

35 **Forest Rotation Stage**

Definition: *Identifies the forest rotation stage that a forest plantation is in at the time of observation.*

Population Standard: Optional

36 **Yield Study ID**

Definition: *A unique identifier of a particular yield study associated with this site.*

Population Standard: Optional

37 **Current Weather**

Definition: *The prevailing weather conditions under which the soil was described/sampled.*

Population Standard: Optional

38 **Current Air Temp** *(°C)*

Definition: *Air temperature reading at the time of describing/sampling the soil in degrees C.*

Population Standard: Optional

39 **Tidal Period**

Definition: *The interval in the tidal cycle over a daily time scale at the site at the time of observation.*

Population Standard: Optional

40 **Bottom Type**

Definition: *The dominant type of material at the soil/water interface in a subaqueous soil setting at the sample location.*

Population Standard: Optional

41 **Water Temp – Upper** *(°C)*

Definition: *The temperature of the water within 10 cm. of the water surface in a subaqueous soil setting, reported in degrees C.*

Population Standard: Optional

42 **Water Temp – Lower**

(°C)

Definition: *The temperature of the water within 10 cm. of the soil/water interface in a subaqueous soil setting, reported in degrees C.*

Population Standard: Optional

43 **Water pH - Upper**

Definition: *The negative common logarithm, of the hydrogen ion activity in the in the upper 10 cm. of the water column at a subaqueous soil site using field test methods. A numerical expression of the relative acidity or alkalinity of a soil sample.*

Population Standard: Optional

44 **Water pH - Lower**

Definition: *The negative common logarithm, of the hydrogen ion activity in the in the bottom 10 cm. of the water column at a subaqueous soil site using field test methods. A numerical expression of the relative acidity or alkalinity of a soil sample.*

Population Standard: Optional

45 **Water pH Method**

Definition: *The kind and/or method used to measure pH of the soil.*

Population Standard: Optional

46 **Dissolved Oxygen - Upper**

(mg/L)

Definition: *The amount of gaseous oxygen (O2) dissolved in an aqueous solution, reported in mg/L, measured in the upper 10 cm. of the water column at a subaqueous soil site. Dissolved oxygen content is an indication of water quality.*

Population Standard: Optional

47 **Dissolved Oxygen - Lower**

(mg/L)

Definition: *The amount of gaseous oxygen (O2) dissolved in an aqueous solution, reported in mg/L, measured in the bottom 10 cm. of the water column at a subaqueous soil site . Dissolved oxygen content is an indication of water quality.*

Population Standard: Optional

48 **Water Salinity - Upper**

(ppt)

Definition: *A measure of soluble salts in the upper 10 cm. of the water column in a subaqueous soil setting. The measurement is typically made using hand held meters that measure either electrical conductivity or optical density that convert the value to parts per thousand (ppt). The term halinity is sometimes used to describe ocean derived salts.*

Population Standard: Optional

49 **Water Salinity - Lower**

(ppt)

Definition: *A measure of soluble salts in the water column within 10 cm. of the soil/water interface in a subaqueous soil setting. The measurement is typically made using hand held meters that measure either electrical conductivity or optical density that convert the value to parts per thousand (ppt). The term halinity is sometimes used to describe ocean derived salts.*

Population Standard: Optional

50 **Current Season Precip.**

(mm)

Definition: *The amount of precipitation received to date during the current growing season.*

Population Standard: Optional

51 **Current Year Precip.**

Definition: *A relative indication of the amount of precipitation received to date for the current year as compared to the long-term average precipitation.*

Population Standard: Optional

52 **Extra Moisture Source**

Definition: *An indicator of the source of extra moisture received at the site, other than natural precipitation.*

Population Standard: Optional

53 **Growing Season Rating**

Definition: *An indication of the status of the current growing season compared to a normal year at the time of data collection.*

Population Standard: Optional

54 **Kind of Land**

Definition: *The kind of land where the plot exists.*

Population Standard: Optional

55 **SAF Cover Type**

Definition: *The forest cover type that exists on the plot as defined by the Society of American Foresters.*

Population Standard: Optional

56 **STM Version ID**

Definition: *The version identifier of the state and transition model for the ecological site that the indicated state and community phase IDs reference.*

Population Standard: Optional

57 **Rosgen Stream Type**

Definition: *The type of stream as determined using the Rosgen stream classifcation system. Reference: Rosgen, D. (1996). Applied river morphology. Wildlife Hydrology, Pagosa Springs, CO.*

Population Standard: Optional

Site Soil Moisture

This table describes the soil moisture profile at the time of the observation. Depth of layers may or may not coincide with depth of morphological horizons in the Horizon table. This Site Soil Moisture table can be used to record the moisture state of a soil at different periods throughout the year by entering a new record for each observation date.

Population standard for all columns in this table: Optional

1 **Top Depth** *(cm)*

Definition: *The distance from the top of the soil to the upper boundary of the moisture layer.*

2 **Bottom Depth** *(cm)*

Definition: *The distance from the top of the soil to the lower boundary of the moisture layer.*

3	**Sensor Depth** *(cm)*	Definition: *The depth below the soil surface at which the soil moisture sensor is located.*
4	**Sensor Kind**	Definition: *The kind of soil moisture sensor installed.*
5	**Observed Moisture State**	Definition: *The relative moisture state of the soil layer at the time of observation.*
6	**Vol Moisture %** *(%)*	Definition: *The measured amount of water in the soil layer, expressed as a volumetric percentage.*
7	**Grav. Soil Moist % Whole Soil** *(%)*	Definition: *The measured amount of water in the soil layer, expressed as a weight percentage.*
8	**Moisture Tension** *(bars)*	Definition: *A measurement of the physical attraction between soil particles and the surrounding soil moisture, as determined by field methods.*

Site Erosion Accelerated

This table describes the soil erosion profile at the time of the observation. It can be used to record the erosion state of a soil at different periods throughout the year by entering a new record for each observation date.

1	**Kind**	Definition: *The type of detachment and removal of surface soil particles caused mainly by human activities (NSSH).* Population Standard: Optional

Site IRIS Tube Data

This table is used to store information collected from IRIS tubes. These tubes are coasted with a iron hydroxide rich paint and inserted into the ground for extended periods of time. In wet soils, the anaerobic conditions cause the iron hydroxide to be reduced and mobilized, which removes the paint from the tube. The degree of paint removal can be used to determine the degree of reduction.

Population standard for all columns in this table: Optional

1	**Tube ID**	Definition: *The ID number assigned to each IRIS tube.*
2	**Top Depth Evaluated** *(cm)*	Definition: *The top depth of the area of the IRIS tube evaluated.*

3	**Bottom Depth Evaluated** *(cm)*	Definition: *The bottom depth of the area of the IRIS tube evaluated.*
4	**Date Installed**	Definition: *The date the monitoring equipment was installed.*
5	**Date Removed**	Definition: *The date the monitoring equipment was removed.*
6	**Iron % Removed** *(%)*	Definition: *The percentage of the iron removed from the IRIS tube between the top and bottom depths evaluated.*
7	**Soil Reduced ?**	Definition: *Indicator of reduction in soil using method SSIR51V1-7.1.1.2.1 (IRIS) Tubes. Presence of reduction is "yes," and absence of reduction is "no."*
8	**Scan Image File Name**	Definition: *The name of the IRIS tube scan image file.*

Site Observation Text

This table is used to store text notes that provide information about the Site Observation table and its child tables.

Population standard for all columns in this table: Optional

1	**Date**	Definition: *The date associated with a particular record, expressed as month, day, year (xx/xx/xxxx).*
2	**Author**	Definition: *The name of the person(s) who entered, or is responsible, for a particular record. Enter complete first and last name; do not use initials.*
3	**Kind**	Definition: *A text entry is identified by kind, category, and subcategory.*
4	**Category**	Definition: *User-defined subdivision of the text note kind. Populate as needed.*
5	**Subcategory**	Definition: *User-defined subdivision of the category. Populate as needed.*
6	**Text Entry**	Definition: *The actual narrative portion of a text entry.*

Site Soil Temperature

This table is used to record measured soil temperature data. Values can be recorded at different depths in the soil profile. This table can be used to record the soil temperature data of a soil at different periods throughout the year by entering a new record for each observation date.

Population standard for all columns in this table: Optional

1	**Depth** *(cm)*	Definition: *The measured depth from the soil surface to the point at which the soil temperature reading was recorded.*
2	**Sensor Kind**	Definition: *The kind of soil temperature sensor installed.*
3	**Temperature** *(°C)*	Definition: *The soil temperature reading at a specified depth.*

Site Surface Fragments

This table stores information about fragments on the surface. The NSSH defines surface fragments as "unattached, cemented pieces of bedrock, bedrock like material, durinodes, concretions, nodules, or pedogenic horizons (e.g., petrocalcic fragments) 2 mm or larger in diameter and woody material 20 mm or larger in diameter that are exposed at the surface of the soil. Surface fragments can be rock fragments, pararock fragments, or wood fragments. Vegetal material other than wood fragments, whether live or dead, is not included."

Population standard for all columns in this table: Typically populated, if surface fragments are present.

1	**Cover %** *(%)*	*Definition: Percentage of the ground covered by fragments 2 mm or larger (20 mm or larger for wood fragments).*
2	**Spacing** *(m)*	Definition: *Average distance between surface stones and/or boulders, measured between edges.*

Columns 3-5 provide information about the size of the fragments.

Population Guidance: Create a new row for each fragment class. Use this chart for size classes.

Flat fragment classes are:

Flat fragment class	Length of fragment (mm)
Channers	2-150
Flagstones	150-380
Stones	380-600
Boulders	≥600

Nonflat fragment classes are:

Nonflat fragment class	Diameter (mm)
Gravel	2-75
Fine gravel	2-5
Medium gravel	5-20
Coarse gravel	20-75
Cobbles	75-250
Stones	250-600
Boulders	≥600

3	**Size Low** *(mm)*	Definition: *Lowest fragment size; corresponds to the USDA classes for fragments.*
4	**Size RV** *(mm)*	Definition: *Relative value fragment size. Must be between the lowest and highest size.*
5	**Size High** *(mm)*	Definition: *Highest fragment size; corresponds to the USDA classes for fragments.*
6	**Kind**	Definition: *The lithology/composition of the surface fragments 2 mm or larger (20 mm or larger for wood fragments).*
7	**Shape**	Definition: *A description of the overall shape of the surface fragments.*
8	**Roundness**	Definition: *An expression of the sharpness of edges and corners of the surface fragments.*
9	**Hardness**	Definition: *The hardness of the fragments.*

Site Area Overlap

This table is used to identify all the spatial areas within which a site occurs. **Accurate population of this table is important, as it provides a means to query sites based on geographic location**. Enter a new record for each area type, such as County, survey area, state, or geographic province. "State or Territory," "County or Parish," "MLRA," and "Non-MLRA Soil Survey Area" should be entered for all sites, and the MLRA soil survey area and MLRA regional office should also be considered.

Population standard for all columns in this table: Typically populated

The area information comes from the Area table in NASIS. Notice the "***Area***" in bold and italics above the four columns. This indicates that the drop-down menus for these four columns are from the Area table.

1 **Area Type NASIS Site Name**

Definition: *The NASIS site that owns the Area Type.*

2 **Area Type Name**

Definition: *The Area Type Name*

Population Guidance: The following six area type names are recommended. Populate additional area types that are pertinent.

1. *State or Territory*
2. *Non-MLRA Soil Survey Area*
3. *MLRA Soil Survey Regional Office Area*
4. *MLRA Soil Survey Area*
5. *MLRA*
6. *County or Parish*

3 **Area Symbol**

Definition: *The Symbol for the Area.*

4 **Area Name**

Definition: *Name of the Area.*

Below is an example of an Area Overlap table that is fully populated.

Site Area Overlap | Site Associated Soils | Site Bedrock | Site Ecological Site History | Site Geomorphic Description | Site Ma

Area

Area Type NASIS Site Name	Area Type Name	Area Symbol	Area Name
NSSC Pangaea	State or Territory	OR	Oregon
NSSC Pangaea	Non-MLRA Soil Survey Area	OR618	Crook County Area, Oregon
NSSC Pangaea	MLRA Soil Survey Regional Office Area	1	Portland, OR
NSSC Pangaea	MLRA Soil Survey Area	1-RED	Redmond, Oregon
NSSC Pangaea	MLRA	10	Central Rocky and Blue Mountain Foothills
NSSC Pangaea	County or Parish	OR013	Crook

Site Associated Soils

This table identifies the soils associated with a site.

3 Associated Soil

Definition: Name of a soil (series or other identifier) that is geographically associated with the soil being described.

Population Standard: Optional

Population Guidance: Only enter soil names other than the soil that was described at the site.

Site Bedrock

This table identifies the bedrock observed at a site. More than one layer of bedrock can be described.

1	**Vertical Order**	Definition: *The vertical sequence of the bedrock layers if more than one layer exists or is observed below the soil profile, beginning with the uppermost layer and moving downward. If only one layer exists or is observed, no entry is required.* Population Standard: Optional
2	**Geologic Group**	Definition: *The lithostratigraphic unit next in rank below a supergroup. A group is a named assemblage of related superposed formations, which may include unnamed formations. Groups are useful for small-scale (broad) mapping and regional stratigraphic analysis.* Population Standard: Optional
3	**Geologic Formation**	Definition: *The basic lithostratigraphic unit used to describe, delimit, and interpret sedimentary, extrusive igneous, metavolvanic, and metasedimentary rock or sediment bodies (excluding metamorphic and intrusive igneous rock) based on lithic characteristics and stratigraphic position. A formation commonly is, but not necessarily, tabular and stratified and is of sufficient extent to be mappable at the earth's surface or traceable in the subsurface at a commonly used map scale.* Population Standard: Optional
4	**Geologic Member**	Definition: *The formal lithostratigraphic unit that is next in rank below a formation and is always part of a formation. A formation does not need to be divided selectively or entirely into members. A member may extend laterally from one formation to another.* Population Standard: Optional
5	**Bedrock Depth** ***(cm)***	Definition: *The observed depth to the top of the bedrock.* Population Standard: Typically Populated, if applicable
6	**Bedrock Kind**	Definition: *The lithology (composition) of the bedrock (AGI).* Population Standard: Typically Populated, if applicable
7	**Bedrock Hardness**	Definition: *The degree of hardness of the underlying rock.* Population Standard: Typically Populated, if applicable
8	**Bedrock Fracture Interval**	Definition: *The distance between bedrock fractures. At a lithic or paralithic contact, the cracks must be more than 10 cm apart (KST).* Population Standard: Optional
9	**Bedrock Weathering**	Definition: *The degree of weathering of the bedrock.* Population Standard: Optional
10	**Bedrock Strike** ***(degrees)***	Definition: *The apparent direction or bearing of a horizontal line in the plane of an inclined stratum.* Population Standard: Optional

11 **Bedrock Dip - Low** ***(degrees)***

Definition: *The low apparent inclination of bedrock from horizontal (AGI).*

Population Standard: Optional

12 **Bedrock Dip - High** ***(degrees)***

Definition: *The high apparent inclination of bedrock from horizontal (AGI).*

Population Standard: Optional

Site Geomorphic Description

This table is constructed and populated similarly to the Component Geomorphic Description table. It is used to describe the geomorphic setting of the site being described. If one feature occurs on another feature, remember that smaller features can only occur on larger features. Consistency in the population of similar features for similar soils is important.

Population standard for all columns in this table: Typically populated

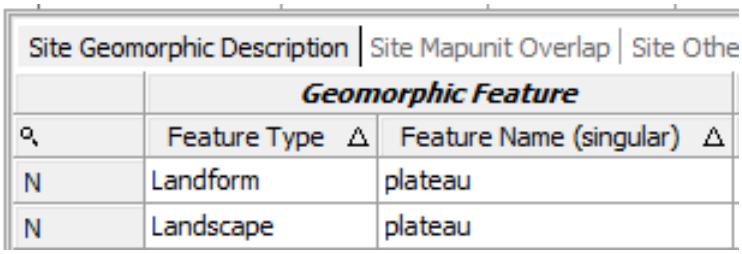
1 **Feature Type**

Definition: *One of several pseudo-hierarchical terms used to describe relative levels of scale for geomorphic terms.*

Population Guidance: The four choices for feature type:

1. Anthropogenic feature
2. Landform
3. Landscape
4. Microfeature

Be careful to select the correct feature type as many feature names are used for both landscape and landform feature types. For example, plateau is a choice for both landscape and landform.



Site Geomorphic Description | Site Mapunit Overlap | Site Othe

	Geomorphic Feature	
	Feature Type △	Feature Name (singular) △
N	Landform	plateau
N	Landscape	plateau

2 **Feature Name (singular)**

Definition: *A word or group of words used to name a feature on the earth's surface, expressed in the singular form.*

Population Guidance: Refer to the Field Book for Describing and Sampling Soils, Version 3.0, for a complete list of feature names. The list of feature names is long, and typically a MLRA SSO will only have a small subset of feature types. Many names can be ignored as they are unique features that cannot possiblly occur in the MLRA SSA. The MLRA SSOL should work with the Regional Office to develop a list of standardized terms for the soil survey area.

3 **Feature Modifier**

Definition: *A user-specified term(s) used in association with geomorphic features to further define, clarify, and describe the setting of a soil on the landscape. For example, the terms may describe relative position, mode of formation, degree of degradation, slope, or geologic time of origin.*

4 **Feature ID**

Definition: *A numeric value, starting with 1, used to identify a feature that occurs on another feature*.

Population Guidance: Enter a numeric value starting with 1 when identifying a landform feature that occurs on another landform feature, such as "dunes on terraces".

- **DO NOT describe landforms as occurring on landscapes.**

5 **Exists on Feature ID**

Definition: *Numeric value used to identify the feature on which it occurs. See screenshot below for an example.*

Population Guidance: This field is used when describing a feature that occurs on another feature. Where this occurs, both features receive a "Feature ID." The smaller feature occurring on a larger feature has the "Feature ID" of the larger feature populated in the "Exists on Feature ID" field. See example below, which shows how to describe dunes that occur on terraces. It is appropriate to populate a landform on a landform or a microfeature on a landform. **DO NOT** populate a landform on a landscape.

Site Geomorphic Description | Site Mapunit Overlap | Site Other Vegetative Classification | Site Parent Material | Site Text

	Geomorphic Feature				
	Feature Type △	Feature Name (singular) △	Feature Modifier	Feature ID	Exists on Feature ID
N	Landform	dune		1	2
N	Landform	terrace		2	
N	Landscape	lava plateau			

Site Ecological Site History

This table stores the ecological site correlated to site. It is also structured to allow for changes to ecological site correlations over time. This occurs due to major changes in site conditions or to correlation to ecological sites. This table maintains a historical record of the ecological sites associated with a specific site.

Population standard for all columns in this table: Typically populated

1 **Correlation Date**

Definition: The date of a particular correlation between a site and an ecological site.

Population Guidance: The ecological site with the most current date will be the ecological site associated with the site. Make sure you assign the most current date to the ecological site that is representative of the site.

Choices for ecological site ID and name are from the Ecological Site table in NASIS. Choose the ecological site by ID or name. Ecological sites in NASIS are pulled from ESIS every evening. All proposed and approved ecological sites in ESIS are included in the choice list.

2	**Ecological Site ID**	Definition: *Ecological site ID as it exists in ESIS.*
3	**Ecological Site Name**	Definition: *Ecological site name as it exists in ESIS.*
4	**Classifier**	Definition: *The name of the person(s) who correlated an ecological site to a site.* Population Guidance: Enter complete first and last name; do not use initials.

Site Mapunit Overlap

This table identifies the map unit in which the site occurs. **Only populate this table if the site is in a SSURGO-certified soil survey polygon**. If the site is in an area of an initial or extensive revision soil survey, it is recommended that this table not be populated until after final correlation. The map unit must be in the local database for it to show up as a choice.

Population standard for all columns in this table: Optional

Choices for columns 1-12 are from the Legend Mapunit table.

Population Guidance: **THE LEGENDS AND MAPUNITS MUST BE LOADED INTO THE LOCAL DATABASE FOR THEM TO SHOW UP IN THIS TABLE.** Use the map unit symbol or the map unit name to populate this table. All other columns will be auto-populated with data stored in the Legend Mapunit table after a choice is made. It is important to confirm that the correct map unit has been populated by reviewing the area and map unit status information that is auto-populated. A map unit symbol can be used in more than one soil survey area.

1	**Area Type NASIS Name Site Name**	Definition: *The name of a particular NASIS site that owns the Area Type.*
2	**Area Type Name**	Definition: *The name of a particular type of area. Area type names include "state", "county", "mlra", etc.*
3	**Area Symbol**	Definition: *A symbol that uniquely identifies a single occurrence of a particular type of area (e.g. Lancaster Co., Nebraska, is NE109).*
4	**Area Name**	Definition: *The name given to the specified geographic area.*
5	**Survey Status**	Definition: *Identifies the operational activity of a soil survey area and currency of published soil information. Examples are Non-Project, Update and Published.*
6	**Geographic Applicability**	Definition: *Identifies the relative geographic extent over which a legend has the most up-to-date soil survey data.*

7	**Rec ID**	Definition: *An internal ID (integer) that is part (or all) of a key that uniquely identifies a record. Also known as part (or all) of the "primary key." This value is managed by NASIS and cannot be edited. This is the MUKEY.*
8	**Mapunit NASIS Site Name**	Definition: *The name of a particular NASIS site that owns the Mapunit record.*
9	**Mapunit Symbol**	Definition: *The symbol used to uniquely identify the soil mapunit in the soil survey.* Population Guidance: Use this field to locate the mapunit, but make sure the correct area name, area symbol, mapunit name, and national mapunit symbol are populated.
10	**National Mapunit Symbol**	Definition: *The symbol used to uniquely identify the soil mapunit nationally. The value is generated by NASIS and is the based on the muiid from the Mapunit table, expressed in base 36. It is a combination of numeric and lowercase alphabetic characters.*
11	**Mapunit Name**	Definition: *The symbol used to uniquely identify the soil mapunit in the soil survey.* Population Guidance: Use this field to locate the mapunit, but make sure the correct area name, area symbol, mapunit symbol, and national mapunit symbol are populated.
12	**Mapunit Status**	Definition: *Identifies the current status of the map unit.*

Site Other Vegetative Classification

This table is used to describe "other vegetative classification types" that are available for use. The choice list is developed by populating the "other vegetative classification type." The Other Vegetative Classification Type table is designed to store vegetative classification types that are not defined by NRCS standards. An example is the U.S. Forest Service forest habitat types. The individual sites that belong to each classification type are recorded in the Other Vegetation Classification table. Ecological sites defined by NRCS standards are recorded in the Ecological Site table.

Population standard for all columns in this table: Typically populated

Choices in columns 1-3 come from the Other Veg Class Type Name table in NASIS. Choose the vegetation class by ID or name.

1	**Other Veg Class Type Name**	Definition: *The name of a particular vegetative classification scheme other than that described in the NRCS Ecological Site Description System. An example might be "West Virginia Grassland Suitability Groups."*
2	**Other Veg Class ID**	Definition: *The identifier of a particular vegetative community other than one of the NRCS forestland or rangeland ecological sites described in the Ecological Site Description System.*
3	**Other Veg Class Name**	Definition: *The name of a particular vegetative classification community other than one of the NRCS forestland or rangeland ecological sites described in the Ecological Site Description System.*

Site Parent Material

This table is used to describe the parent material in which the soil at a site formed. If multiple layers of material exist, each is described on a separate row. Data entered in this table are used to calculate the Parent Material Group Name field in the Site table. If the soil formed in multiple layers of material, this information should be recorded in the table by identifying the layers in the Vertical Order field.

1 **Vertical Order**

Definition: *The sequence in which the parent material occurs, when more than one parent material exists for one soil profile. If only one parent material occurs for a soil, i.e. no lithologic discontinuities, no entry is required.*

Population Standard: Typically populated if multiple types of parent material are present

Population Guidance: Enter 1 for the parent material that occurs highest in the profile, 2 for the next parent material in the sequence, and so forth. See example below that shows volcanic ash occurring over residuum weathered from basalt. Notice that the depths are different.

Vertical Order	Top Depth	Bottom Depth	Textural Modifier	General Modifier	Kind	Origin
1	0	25			volcanic ash	
2	25	100			residuum	basalt

Use the same value in the vertical order if the types of parent material are coincident (mixed together). See example below that shows volcanic ash mixed with sandy alluvium. Notice that the depths are identical.

Vertical Order	Top Depth	Bottom Depth	Textural Modifier	General Modifier	Kind	Origin
1	0	100			volcanic ash	
1	0	100	sandy		alluvium	

2 **Top Depth** *(cm)*

Definition: *The distance from the top of the soil to the upper boundary of the layer of parent material being described.*

Population Standard: Typically populated

3 **Bottom Depth** *(cm)*

Definition: *The distance from the top of the soil to the base of the parent material layer being described.*

Population Standard: Typically populated

4 **Textural Modifier**

Definition: *General description of the texture of the parent material. Class limits correspond to those of textural groupings defined in the Soil Survey Manual and family particle-size classes in Soil Taxonomy.*

Population Standard: Optional

Population Guidance: Typically populated for windblown and water-deposited parent material.

5 **General Modifier**

Definition: *A user specified term(s) used to further describe the nature of the parent material for a given soil.*

Population Standard: Optional

Population Guidance: Use this field to add terminology to the parent material. For example, add the term "stratified" for alluvium.

General Modifier	Kind
stratified	alluvium

6 **Kind**

Definition: *A term describing the general physical, chemical, and mineralogical composition of the material, mineral or organic, from which the soil develops. Mode of deposition and/or weathering may be implied or implicit.*

Population Standard: Typically populated

Population Guidance: There are numerous choices for the kind of parent material ,and the correct option may not always be obvious. The MLRA SSOL should work with the RO to develop a list of acceptable kinds of parent material for the MLRA SSA to ensure soil parent material is consistently described.

7 **Origin**

Definition: *The type of bedrock from which the parent material was derived.*

Population Standard: Typically populated, if known

Population Guidance: The choice list includes specific bedrock types and generalized rock types. For example, enter basalt as the bedrock type or enter volcanic, unspecified, if the kind of volcanic rock the soil is derived from is not known.

8 **Weathering (Obsolete)**

Definition: *The type of bedrock from which the parent material was derived.*

Population Standard: DO NOT POPULATE

Site Text

This table is used to store notes related to the site being described. It can be used to store thoughts, opinions, and additional information on the site. Do not store information about the pedon in this table. Use the Pedon Text table to store text notes related to the pedon description.

Population standard for all columns in this table: Optional

Population guidance for table: Site text notes are encouraged. Enter them liberally as this is the only place to add narrative statements about the site.

1 **Date**

Definition: *The date associated with a particular record, expressed as month, day, year (xx/xx/xxxx).*

2 **Author**

Definition: *The name of the person(s) who entered, or is responsible, for a particular record. Enter complete first and last name; do not use initials.*

3	**Kind**	Definition: *A text entry is identified by kind, category, and subcategory.*
4	**Category**	Definition: *User-defined subdivision of the text note kind. Populate as needed.*
5	**Subcategory**	Definition: *User-defined subdivision of the category. Populate as needed.*
6	**Text Entry**	Definition: *The actual narrative portion of a text entry.*

Site USGS Quadrangle Overlap

This table is used to identify the quadrangle in which the site occurs. The USGS quadrangle name is a choice list derived from this table. The table now stores all of the quadrangles.

Population standard for all columns in this table: Optional

Choices in the following columns are from the USGS Quadrangle Type table in NASIS. Choose the quadrangle by symbol or name.

1	**USGS Quadrangle Type**	Definition: *The name of a USGS Quadrangle series (e.g., 7.5-minute).*
2	**USGS Quadrangle Symbol**	Definition: *The official name assigned to a particular USGS quadrangle.*
3	**USGS Quadrangle Name**	Definition: *The official name assigned to a particular USGS quadrangle.*

Vegetation Plot

This table is used to store data on plants observed at a site. If not entering plant name, ignore this table.

Historically, names of all plants observed at a site were stored in the Site Existing Vegetation table. When the NASIS 7.0 data model was released, all data in the Site Existing Vegetation table was transferred to the Plot Plant Inventory table, a child table of the Vegetation Plot table. The Site Existing Vegetation table was removed from NASIS, so from now on all plant names are stored in the Plot Plant Inventory table.

The Vegetation Plot object is designed to store ecological site inventory (ESI) data. It consists numerous child tables and columns that are designed to capture the complex ESI data. When a field soil scientist makes a list of plants observed at a site, it is not considered ESI information. It is a simple observation about the kinds of plants at a location. **Storage of ESI data is addressed in this document. This document only provides guidance for populating tables and columns used to capture a simple list of plants observed at a site. All other tables and columns in the Vegetation Plot object are not addressed in this**

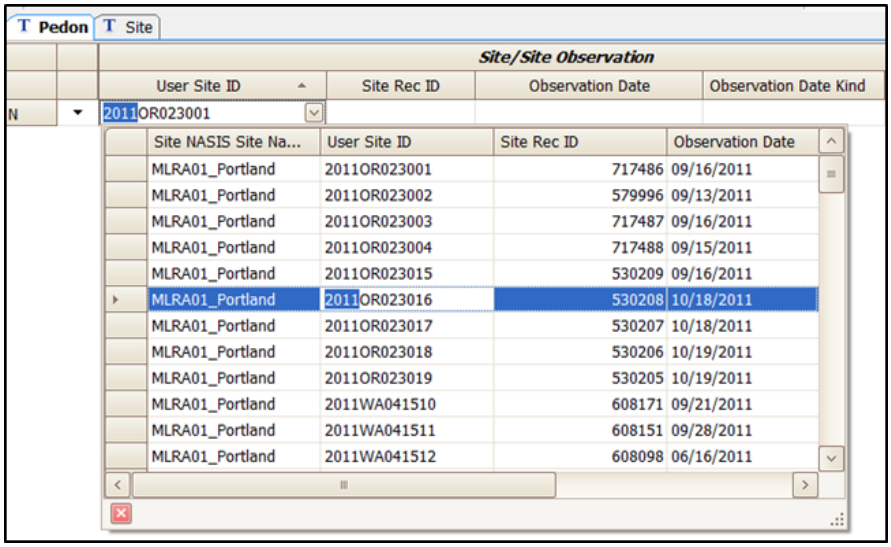
document. Consult the regional office staff for questions about populating these other columns and tables.

1 **User Site ID**

Definition: *A short label to help a user identify a particular site.*

Population Standard: Required

Population Guidance: Use this field to link the site record to the Vegetation Plot table. Begin typing the User Site ID into the field and a choice list will appear (see screenshot below). **A vegetation plot entry MUST be linked to a Site Observation**. The Site must be in the local database for it to be available as a choice.



2 **Site Rec ID**

Definition: *An internal ID (integer) that is part (or all) of a key that uniquely identifies the site record. This value is managed by NASIS and cannot be edited.*

Population Standard: Required

3 **Observation Date**

Definition: *The date on which this particular soil was described or sampled, expressed as month, day, year (MM/DD/YYYY).*

Population Standard: Required

Population Guidance: Be sure the correct date is selected if more than one record is populated in the Site Observation table.

4	**Observation Date Kind**	Definition: *Indicates whether the date associated with a site observation is the actual date of observation or some other date.* Population Standard: Required Population Guidance: Be sure the correct date is selected if more than one record is populated in the Site Observation table.
5	**Site Observation Record ID**	Definition: *An internal ID (integer) that is part (or all) of a key that uniquely identifies the site observation record. This value is managed by NASIS and cannot be edited.* Population Standard: Required
6	**Vegetation Plot ID**	Definition: *An alpha-numeric code that uniquely identifies a single occurrence of a particular vegetation plot.* Population Standard: Required Population Guidance: The Vegetation Plot ID must match the User Site ID.

Plot Plant Inventory

This table is used to store the list of plants.

1	**Plant Symbol**	Definition: *A unique symbol used to identify a plant genus or a plant species. (The PLANTS Database, USDA-NRCS, National Plant Data Center)* Population Standard: Typically populated
2	**Scientific Name**	Definition: *The full genus and species name as listed in The PLANTS Database, USDA-NRCS, National Plant Data Center.* Population Standard: Typically populated
3	**National Vernacular Name**	Definition: *The most generally accepted common name of a plant.* Population Standard: Typically populated
4	**Composition %**	Definition: *The percentage of the total plant community occupied by a particular plant species as determined by the Double Sampling method.* Population Standard: Optional

Pedon

This table stores information about the classification of the pedon, the purpose of the pedon, the type of pedon, and the person(s) that described the pedon. It also provides links to lab pedons, sites, and transects. More than one pedon description can be recorded and linked to a single site record. This may occur when:

- Samples are sent to the KSSL for characterization, and the lab makes a copy of the pedon.
- A pedon is redescribed.
- Pedons described at a site are so close together that they are within reasonable limits of the GPS accuracy.

Note: Before entering the pedon, data must first be entered in the Site and Site Observation tables. The pedon record requires a link to the appropriate site observation record. Refer to Getting Started – Creating New Site and Pedon Records for step-by-step instructions on how to link a site to a pedon.

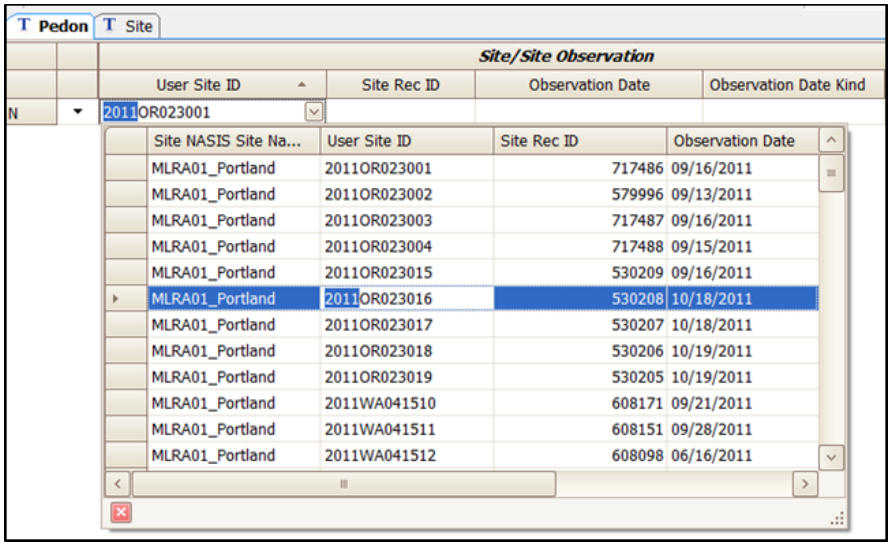
Columns 1-5 are linked to data stored in the Site and Site Observation tables. The site must be loaded into the local database for it to be available as a choice.

1 **User Site ID**

Definition: *A short label to help a user identify a particular pedon.*

Population Standard: Required

Population Guidance: Use this field to link the site record to the pedon. Begin typing the User Site ID into the field, and a choice list will appear (see screenshot below). **A pedon MUST be linked to the site and site observation entries**. The site must be in the local database for it to be available as a choice.



2 **Site Rec ID**

Definition: *An internal ID (integer) that is part (or all) of a key that uniquely identifies the site record. This value is managed by NASIS and cannot be edited.*

Population Standard: Required

3 **Observation Date**

Definition: *The date on which this particular soil was described or sampled, expressed as month, day, year (MM/DD/YYYY).*

Population Standard: Required

Population Guidance: Be sure the correct date is selected if more than one record is populated in the Site Observation table.

4 **Observation Date Kind**

Definition: *Indicates whether the date associated with a site observation is the actual date of observation, or something else.*

Population Standard: Required

Population Guidance: Be sure the correct date is selected if more than one record is populated in the Site Observation table.

5 **Site Observation Record ID**

Definition: *An internal ID (integer) that is part (or all) of a key that uniquely identifies the site observation record. This value is managed by NASIS and cannot be edited.*

Population Standard: Required

6 **User Pedon ID**

Definition: *A short label to help a user identify a particular pedon.*

Population Standard: Required

Population Guidance: A duplication of the User Site ID unless more than one pedon is associated with a site, in which case additional characters are added at the end of the User Pedon ID.

7 **Pedon Record Origin**

Definition: *A label describing the original source of a particular pedon data record, i.e. NSSL, Nebraska, or Saunders County Soil Survey.*

Population Standard: Typically populated

Population Guidance: Used to indicate the original source of a particular pedon data record. For example, converted from PDP 3.x, PedonPC, or NASIS. Auto-populates if a pedon is entered directly into NASIS. **Enter NASIS for new pedons manually entered into NASIS.**

8 **Describer's Name**

Definition: *Name of person(s) that described the soil.*

Population Standard: Required

Population Guidance: Enter the full name of the person(s) that described the pedon. DO NOT use initials. Enter “Unknown” if describers name is not known.

Columns 9, 11, and 12 are linked to data stored in the Pedon Taxonomic History table.

9 **Current Taxon Name**

Definition: *The name of the taxonomic unit. (Name of your soil)*

Population Standard: Typically populated

Calculation: Pedon Current Taxonomic Class

10 **Local Phase**

Definition: *Phase criterion to be used to help uniquely identify soil components or pedons. These are terms such as "drained," "eroded," etc.*

Population Standard: Optional

11 **Current Taxonomic Class**

Definition: *A concatenation of the Soil Taxonomy subgroup and family for a soil (long name).*

Population Standard: Typically populated

Calculation: Pedon Current Taxonomic Class

12 **Current Taxon Kind**

Definition: *Identifies the kind of taxonomic unit described. Examples are series and miscellaneous areas.*

Population Standard: Typically populated

Calculation: Pedon Current Taxonomic Class

13 **Pedon Type**

Definition: *Identification of what the description represents in relation to a series, component, etc.*

Population Standard: Required

Population Guidance: **Tthe choice list is a key**. Start with 1 and move down the list to 7. Select the first option that defines the pedon type.

1. OSD pedon
2. TUD pedon
3. Representative pedon for component
4. Taxadjunct to series
5. Correlates to named soils
6. Confirmation description
7. Undefined observation

For example, if the pedon is a taxadjunct and also a TUD, choose "TUD pedon" because it is higher in the list.

For older pedons, "within range of map unit" or "map unit inclusion" may be populated in this field. These are obsolete choices that were used in older versions of NASIS.

14 **Pedon Purpose**

Definition: *The identification of the intended purpose of the profile description.*

Population Standard: Required

Population Guidance: Soil survey inventory is the most common choice. For older pedons, "forest data site," "range data site," or "full pedon description" may be populated in this field. These are obsolete choices that were used in older versions of NASIS.

15 **Pedon #**

Definition: *Phase criterion to be used to help uniquely identify soil components or pedons. These are terms such as "drained," "eroded," etc.*

Population Standard: Optional

16 **Certified Lab Pedon Description?**

Definition: *An indicator of whether or not this pedon record is the one certified for distribution with analytical lab results from the Soil Survey Laboratory and other National Cooperative Soil Survey Laboratories.*

Population Standard: Required

Population Guidance: The population of this field ensures that the correct pedon description is distributed with the laboratory data when there are duplicate copies of a pedon description. If the pedon was sampled, the Certified Lab Pedon Description Flag should be checked.

Only check for pedons that have been sampled.

17 **Exposure Size**

Definition: *The approximate lateral extent of the soil exposure observed and/or sampled.*

Population Standard: Optional

18 **Exposure UOM**

Definition: *The unit of measure associated with the relative exposure size column.*

Population Standard: Optional

Columns 19-20 are duplicated in NASIS as they occur in both the Pedon and Site Observation tables. These columns in the Pedon table (34-39) are only populated for Dynamic Soil Properties study sites that have multiple pedons linked to one site. These projects include sites that has as many as 10 pedons linked to that them. The overall surface condition of the site is described, and the surface condition for each pedon is described. The condition of the site is recorded in the Site Observation table, and the condition of the ten pedons is recorded in the Pedon table.

19 **Cover Kind 1**

Definition: *The natural or artificial material that is observed to cover a portion of the earth's surface. It is determined (at least conceptually) as a vertical projection downward. Level one of a hierarchical system. (1992 NRI Instructions)*

Population Standard: Typically, only populated for Dynamic Soil Property study sites.

20 **Cover Kind 2**

Definition: *The description of ground cover based on a set of vegetal and non-vegetal classes. It is determined (at least conceptually) as a vertical projection downward. Level two of a hierarchical system.*

Population Standard: Typically, only populated for Dynamic Soil Property study sties.

21 **Erosion Class**

Definition: *Class of accelerated erosion.*

Population Standard: Optional

Columns 22 and 23 store information for lab-sampled pedons.

When a pedon is sampled and submitted to the KSSL for analysis, the lab makes a copy of the pedon in NASIS. That means that NASIS will have two versions of the sampled pedon. One is owned by a MLRA SSO NASIS group, and the other is owned by a KSSL NASIS group. The version owned by a KSSL NASIS group is protected and cannot be edited. **Be sure that the Lab Pedon # assigned by the KSSL is transferred to the copy of the pedon owned by the MLRA SSO.** Only one of these two pedons will be published on the KSSL data sheet. The MRLA SSO version will be published as long as the Lab Pedon # is populated in the MLRA SSO version.

22 **Lab Source ID**

Definition: *Soil characterization laboratory identification value.*

Population Standard: See" Population Guidance"

Population Guidance: An identifier of the soil characterization laboratory responsible for analyzing the samples from the pedon.

This field should be populated for all sampled pedons. It should be NULL if no samples were taken.

23 **Lab Pedon #**

Definition: *An identifier number for the pedon assigned by the laboratory. This number is used to link the morphological pedon description with the associated measured property values from the laboratory.*

Population Standard: See" Population Guidance"

Population Guidance: This number is populated by the laboratory in the KSSL version of the sampled pedon. If a copy of a sampled pedon is made, the laboratory sample numbers must be populated to ensure that they are included in the published pedon description. This typically requires the MLRA SSO to copy the lab pedon # from the KSSL copy of the pedon into the MRLA SSO copy of the pedon.

It should be NULL if no samples were taken.

Columns 24 -26 are linked to data stored in the Transect table.

24 **User Transect ID**

Definition: *An identifier assigned by the user to a particular transect that is intended to aid in the identification of the transect for the user.*

Population Standard: Optional

Population Guidance: Selecting a User Transect ID will link a pedon to a transect. The transect must be in the local database for it to show up in the choice list.

25 **Transect Author**

Definition: *Names of the soil scientist(s) that ran the transect.*

Population Standard: Optional

26 **Transect Rec ID**

Definition: *The record ID of the transect.*

Population Standard: Optional

27 **Transect Stop Number**

Definition: *The stop number along the specified transect.*

Population Standard: Optional

28 **Transect Interval** *(m)*

Definition: *The distance between the previous point and the current point in a transect.*

Population Standard: Optional

29 **RaCA Point #**

Definition: *The number of the individual pedon/observation point within the RaCA plot.*

Population Standard: Optional

Population Guidance: RaCA stands for "Rapid Carbon Assessment," which is a one-time sampling initiative. This field is typically only populated for pedons sampled as part of the RaCA.

30 **Soil Replicate #**

Definition: *The unique numeric identifier of the pedon/observation point location within a plot.*

Population Standard: Optional

31 **Azimuth From Plot Center**

Definition: *The azimuth that this pedon/sample location is on from the center or reference point of a plot.*

Population Standard: Optional

32 **Distance From Plot Center** *(m)*

Definition: *The distance this pedon/sample location is from the center or reference point of a plot.*

Population Standard: Optional

33 **Rectangular Plot Line #**

Definition: *The number of the line within a rectangular plot on which this pedon/sample location occurs.*

Population Standard: Optional

34 **Distance From Baseline**

(m)

Definition: *The distance this pedon/sample location is from the baseline of a square plot.*

Population Standard: Optional

Columns 34-39 are duplicated in NASIS as they occur in both the Pedon and Site Observation tables. These columns in the Pedon table (35-40) are only populated for Dynamic Soil Properties study sites that have multiple pedons linked to one site. These projects include sites that have as many as 10 pedons linked to the site. The overall surface condition of the site is described, and the surface condition for each pedon is described. Thecondition of the site is recorded in the Site Observation table, and the condition of the ten pedons is recorded in the Pedon table.

35 **Pedoderm Class**

Definition: *The distance this pedon/sample location is from the baseline of a square plot.*

Population Standard: Typically, only populated for Dynamic Soil Property study sites.

.

36 **Pedoderm Loose Cover Indicator**

Definition: *An indicator of the presence of loose mineral soil material overlying a pedoderm.*

Population Standard: Typically, only populated for Dynamic Soil Property study sites.

37 **Biol. Crust Type Dominant**

Definition: *The dominant type of biological crust observed.*

Population Standard: Typically, only populated for Dynamic Soil Property study sites.

38 **Biol. Crust Type Secondary**

Definition: *The secondary type of biological crust observed.*

Population Standard: Typically, only populated for Dynamic Soil Property study sites.

39 **Phys Crust Subtype**

Definition: *A subcategory of physical crust pedoderm class denoting the primary mechanism involved in their formation.*

Population Standard: Typically, only populated for Dynamic Soil Property study sites.

40 **Crust Dev Class**

Definition: *An expression of the strength or degree of development of the crust being described.*

Population Standard: Typically, only populated for Dynamic Soil Property study sites.

41 **Range Veg. Canopy Type Dominant**

Definition: *The dominant type of range vegetation present.*

Population Standard: Optional

42 **Range Veg. Canopy Type Secondary**

Definition: *The secondary type of range vegetation present.*

Population Standard: Optional

43 **Forest Overstory Veg. Type**

Definition: *The type of vegetation comprising the forest overstory strata.*

Population Standard: Optional

44 **Forest Understory Veg. Type**

Definition: *The type of vegetation comprising the forest understory strata.*

Population Standard: Optional

45 **Forest Groundcover Veg. Type Dominant**

Definition: *The dominant type of vegetation comprising the forest groundcover strata.*

Population Standard: Optional

46 **Forest Groundcover Veg. Type Secondary**

Definition: *The type of vegetation comprising the forest understory strata.*

Population Standard: Optional.

47 **Agronomic Feature**

Definition: *The type of agronomic feature present at the sample location.*

Population Standard: Optional

48 **Other Feature Description**

Definition: *A description of other features that might affect fine-scale variability - e.g. trail, tree-throw, etc.*

Population Standard: Optional

49 **Current Crop**

Definition: *The name of the most recent or current crop.*

Population Standard: Optional

50 **Litter Cover %**

(%)

Definition: *The percent of the soil surface covered by plant litter at the sample point location. This includes all types of plants including crops.*

Population Standard: Optional

51 **Residue Description**

Definition: *A narrative description of plant and/or crop residue that is on the site prior to sampling activities.*

Population Standard: Optional

52 **Hydric?**

Definition: *An indicator of whether or not the location meets the criteria of a hydric soil.*

Population Standard: Typically populated

Columns 53-55 are new in NASIS 6.2. They are designed to provide information about the degree of quality control and quality assurance a pedon has received. Contact the regional office to determine standards for populating these columns.

53 **Certification Status**

Definition: *An indicator of the level of review and certification for use that the pedon description data has received.*

Population Standard: Optional

54 **QC Status**

Definition: *Designation of the level of quality control review that a pedon and associated laboratory data has undergone.*

Population Standard: Optional

Population Guidance: This field and the QA Status field use the same choice list.

55 **QA Status**

Definition: *Designation of the level of quality assurance review that a pedon and associated laboratory data has undergone.*

Population Standard: Optional

Columns 56-63 store information about subaqueous soil (SAS) sampling techniques.

56 **SAS Pipe Length Total** ***(cm)***

Definition: *Designation of the level of quality assurance review that a pedon and associated laboratory data has undergone.*

Population Standard: Optional

57 **SAS Pipe Length External** ***(cm)***

Definition: *The length of the collection tube used for sampling subaqueous soils that extends above the soil surface after insertion of the tube, as measured on the exterior of the tube.*

Population Standard: Optional

58 **SAS Pipe Length Unfilled** ***(cm)***

Definition: *The unfilled length of the collection tube used for sampling subaqueous soils that extends above the soil surface after insertion of the tube, as measured on the interior of the tube.*

Population Standard: Optional

59 **SAS Core Settlement** ***(cm)***

Definition: *The amount of settlement/compaction (also called 'rot') of the subaqueous soil core. Computed by subtracting riser length from unfilled pipe length.*

Population Standard: Optional

60 **SAS Core Length** ***(cm)***

Definition: *The measured length of the subaqueous soil core.*

Population Standard: Optional

61 **SAS Core Storage Site**

Definition: *The location where the subaqueous core is stored.*

Population Standard: Optional

62 **SAS Exposure Begin**

Definition: *The clock time that the sample core was opened and exposed to aerobic conditions for description.*

Population Standard: Optional

63 **SAS Exposure End**

Definition: *The clock time that the sample core was closed to aerobic conditions after the description was completed.*

Population Standard: Optional

Pedon Horizon

This table stores information for each horizon described for the pedon.

NOTE: Combination horizons, also known as dual horizons (E and Bt, B/E, and E/B horizons), should be entered as two separate horizon records. For example, for an E and Bt horizon, enter one record for the E part of the horizon and one for the Bt part. Both records will have the same horizon depth and horizon designation, but the part of the horizon being described is indicated in parentheses. See screenshot below for an example. Do not use this method to populate the Component Horizon table.

		Thickness									
Top Depth ▲	Bottom Depth ▲	Low	RV	High	Observation Method	Designation	Disc	Master	Prime	Sub	Tex Mod & Class
0	23		23		pit, small	Ap C		A			ASHY-LS C
23	56		23		pit, small	E&Bt1 (E) M		E and B		1	S C
23	56		23		pit, small	E&Bt1 (Bt) M		E and B		1	S C
56	127		71		pit, small	E&Bt2 (E) M		E and B		2	S C
56	127		71		pit, small	E&Bt2 (Bt) M		E and B		2	S C
99	132		33		pit, small	2BC C	2	BC			GR-S C
132	160		28		pit, small	3C C	3	C			GRV-COS C

1 **Top Depth** *(cm)*

Definition: *The distance from the top of the soil to the upper boundary of the soil horizon.*

Population Standard: Typically populated

2 **Bottom Depth** *(cm)*

Definition: *The distance from the top of the soil to the base of the soil horizon.*

Population Standard: Typically populated

3 **Thickness Low** *(cm)*

Definition: *A low measurement from the top to bottom of a soil horizon throughout its areal extent.*

Population Standard: Optional

4 **Thickness RV** *(cm)*

Definition: *A RV measurement from the top to bottom of a soil horizon throughout its areal extent.*

Calculation: Pedon Horizon Thickness

Population Standard: Typically populated

Population Guidance: Populate the bottom and top depths before calculating.

5 **Thickness High** *(cm)*

Definition: *A high measurement from the top to bottom of a soil horizon throughout its areal extent.*

Population Standard: Optional

6 **Observation Method**

Definition: *Method of making the exposure for observation.*

Population Standard: Typically populated

7 **Designation**

Definition: *The concatenation of three kinds of symbols (four data elements) used in various combinations to designate layers within the soil. (SSM)*

Population Standard: Typically populated

Calculation: Pedon Horizon Designation

Population Guidance: The designation can be populated manually or calculated. Manually enter the designation for combination horizons, such as E and Bt horizons. For all other horizons, calculating the field is recommended. To calculate, first correctly populate the following five fields:

(NOTE: Some of these fields will not always be populated.)

1. Disc
2. Master
3. Prime
4. Sub
5. Suffix (in the Pedon Horizon Designation Suffix table)

The calculation will concatenate the designation from these fields.

8 **Disc**

Definition: *One of four kinds of symbols, when concatenated, are used to distinguish different kinds of layers in soils. A discontinuity is a significant change in particle-size distribution or mineralogy that indicates a difference in the material from which the horizons formed and/or a significant difference in age, unless that difference in age is indicated by the suffix "b". (SSM)*

Population Standard: Typically populated, if applicable

9 **Master**

Definition: *One of four kinds of symbols, that when concatenated, are used to distinguish different kinds of layers in soils. Master horizons and layers are the base symbols to which other characters are added to complete the designations. Capital letters, virgules (/), the word 'and', and carets (^) are used. (SSM)*

Population Standard: Typically populated

10 **Prime**

Definition: *A character used to indicate that this horizon has an identical horizon designation as some overlying horizon. The two horizons in question are separated by at least one other horizon.*

Population Standard: Typically populated, if applicable

11 **Sub**

Definition: *One of the four kinds of symbols, when concatenated, are used to distinguish different kinds of layers in soils. Vertical subdivisions are used to subdivide a horizon or layer designated by a single letter or combination of letters.*

Population Standard: Typically populated, if applicable

Population Guidance: If a master horizon is subdivided, enter a consecutive numeric value for each subdivision.

12 **Tex Mod & Class**

Definition: *Name for the concatenation of TEXTURE_MODIFIER and TEXTURE_CLASS.*

Population Standard: Typically populated

Calculation: Pedon Horizon Texture

Population Guidance: Populate the Stratified field, Horizon Texture table, and Pedon Horizon Texture Modifier table before calculating.

13 **Stratified?**

Definition: *A Boolean flag that when set (Y) indicates that the textures that comprise a particular texture group, are stratified.*

Population Standard: Typically populated

Population Guidance: If the stratified box is checked, a SR will be placed at the beginning of the Tex Mod & Class.

14 **Est Clay %**

(%)

Definition: *Mineral particles less than 0.002mm in equivalent diameter as a weight percentage of the less than 2.0mm fraction, estimated at the time of sampling or description.*

Population Standard: Typically populated

15 **Carbonate Clay - Est.**

(%)

Definition: *The field estimated percent carbonate clay content.*

Population Standard: Typically populated

Population Guidance: Enter zero if no carbonate clay is present.

16 **Est Silt %**

(%)

Definition: *Mineral particles 0.002 to 0.05mm in equivalent diameter as a weight percentage of the less than 2.0mm fraction, estimated at the time of sampling or description.*

Population Standard: Typically populated

Population Guidance: Normally estimated by subtracting the percentages of field-estimated clay and sand from 100 percent.

17 **Est Sand %**

(%)

Definition: *Mineral particles 0.05mm to 2.0mm in equivalent diameter as a weight percentage of the less than 2 mm fraction, estimated at the time of sampling or description.*

Population Standard: Typically populated

18 **Total Fragment Volume**

(%)

Definition: *The total volume percentage of the horizon occupied by the 2 mm or larger fraction (20 mm or larger for wood fragments), on a whole soil base.*

Population Standard: Typically populated

Calculation: Fragment Total Volume

Population Guidance: Populate the Pedon Horizon Fragments table before running the calculation. Enter zero if no fragments are present.

19 ***Variegated Colors?***

Definition: *An indicator as to whether the described colors are variegated (mixed) or not.*

Population Standard: Typically populated

Population Guidance: Typically used for horizons that are dominantly sand or loamy sand textures.

20 **Observed Moisture State**

Definition: *The relative moisture state of the soil layer at the time of observation.*

Population Standard: Typically populated

21 **Rupture Moist**

Definition: *The rupture resistance of a block-shaped specimen of 25 to 30 mm size and moist water state. (SSM)*

Population Standard: Typically populated

22	**Rupture Dry**	Definition: *The rupture resistance of a block-shaped specimen of 25 to 30 mm size and dry water state. (SSM)* Population Standard: Typically populated
23	**Rupture Cement**	Definition: *The rupture resistance of a block-like specimen of 25 to 30 mm size that has been air dried and then submerged in water. (SSM)* Population Standard: Typically populated Population Guidance: Enter noncemented if no cementing agents are present.
24	**Rupture Plate**	Definition: *The rupture resistance of an air-dry, plate-shaped specimen of specified size. (SSM)* Population Standard: Optional
25	**Manner of Failure**	Definition: *The manner in which soil specimens fail under increasing force. (SSM)* Population Standard: Optional
26	**Stickiness**	Definition: *The manner in which soil specimens fail under increasing force. (SSM)* Population Standard: Typically populated
27	**Plasticity**	Definition: *The degree to which a puddled, wet soil mass is permanently deformed without rupturing by a slow continuous application of force in any direction. (SSM)* Population Standard: Typically populated
28	**Tough Class**	Definition: *The relative force necessary to deform a puddled soil mass near the plastic limit.* Population Standard: Optional
29	**Penetration Resistance**	Definition: *The capacity of an undisturbed soil mass to resist penetration by a rigid object.* Population Standard: Optional
30	**Penetration Orientation**	Definition: *The orientation of the penetrometer rod when inserted into the soil.* Population Standard: Optional

Columns 31, 32, 33, and 35 are populated only if actual measured data is available.

31	**Ksat** ***(um/s)***	Definition: *The calculated average of field measured saturated hydraulic conductivity. Describes the ability of soil (porous media) to transmit water when the soil is saturated.* Population Standard: Optional
32	**Ksat Std Dev** ***(um/s)***	Definition: *The statistical standard deviation of the calculated mean saturated hydraulic conductivity value, using the individual measurements taken for a particular soil horizon.* Population Standard: Optional

33 **Ksat Rep #**

Definition: *The number of measurements made, at the same time and location to reduce sampling error. These individual measurements are used to calculate the mean saturated hydraulic conductivity for the soil horizon.*

Population Standard: Optional

34 **Permeability Class**

Definition: *The amount of water that would move vertically through a unit area of saturated soil in unit time under unit hydraulic gradient. Expressed as a class for one horizon.*

Population Standard: Optional

35 **Infiltration Rate** ***(cm/hr)***

Definition: *The measured infiltration rate reported in cm/hour.*

Population Standard: Optional

36 **Field pH**

Definition: *The negative common logarithm, of the hydrogen ion activity in the soil at field moisture conditions using field test methods. A numerical expression of the relative acidity or alkalinity of a soil sample. (SSM) This is also the initial pH that should be used when performing SSIR51V1-7.1.3 the Hydrogen Peroxide Test, Delta pH for Acid Sulfate Soils.*

Population Standard: Typically populated

37 **pH Method**

Definition: *The kind and/or method used to measure pH of the soil.*

Population Standard: Typically populated

Columns 38-41 store information about effervescence, which is the gaseous response of carbonates to the application of hydrochloric acid (HCL). Effervescense is commonin arid climates and in areas that have parent material that is rich in carbonates. When measuring and populating effervescence classes, it is important to 1) know the normality of the HCL solution used to determine effervescence and 2) only measure effervescence of the soil matrix. DO NOT include visible carbonate masses in the measurement (FBDSS and SSM).

38 **Efferv Class**

Definition: *General terms used to describe the degree of effervescence of soil material when tested for carbonates in the field.*

Population Standard: Typically populated

Population Guidance: Enter “none” for horizons that do not effervesce.

39 **Efferv Loc - obsolete**

Definition: *Location of the carbonates in the soil matrix in respect to morphological soil properties.*

Population Standard: DO NOT POPULATE

40 **Efferv Agent**

Definition: *The chemical reagent used to test for carbonates in the field.*

Population Standard: Typically populated

41 **Carbonate Dev Stage - FE**

Definition: *The stage of development of pedogenic carbonates in the fine earth matrix.*

Population Standard: Optional

42 **Carbonate Dev Stage - CF**

Definition: *The stage of development of pedogenic carbonates in the coarse fragment matrix.*

Population Standard: Optional

Columns 43 and 44 store information about manganese effervescence (MN Efferv), which is the gaseous response of manganese oxides to the application of hydrogen peroxide (H2O2).

43 **MN Efferv Class**

Definition: *General terms used to describe the degree of effervescence of soil material when tested for manganese oxides in the field.*

Population Standard: Optional

44 **MN Efferv Agent**

Definition: *The chemical reagent used to test for manganese oxides in the field.*

Population Standard: Optional

Columns 45-47 store information about the reaction of soil horizons to Alpha-alpha dipyridyl. This solution is used to determine the presence of reduced iron (Fe+2). The confirmed presence of Fe+2 is an indicator of anaerobic conditions.

45 **A-A Dipyridyl Reaction**

Definition: *A chemical test used on a freshly broken field moist sample to infer the presence of aquic conditions at the time of sampling. A positive reaction (reddish color change) indicates the presence of reduced iron (Fe II). A negative reaction (no color change) indicates reduced iron is not present.*

Population Standard: Optional

46 **A-A Dipyridyl Percent**

Definition: *The percent of the area of a particular feature with a positive reaction to Alpha-Aalpha dipyridyl.*

Population Standard: Optional

47 **A-A Dipyridyl Location**

Definition: *The location of the Alpha-alpha dipyridyl test in relation to morphological features.*

Population Standard: Optional

48 **Excav Diff**

Definition: *An estimation of the difficulty of working an excavation into soil layers, horizons, pedons, or geologic layers. In most instances, excavation difficulty is related to and controlled by a water state.*

Population Standard: Optional

49 **Odor**

Definition: *The type of odor detected in a soil horizon.*

Population Standard: Optional

Population Guidance: Hydrogen sulfide (H_2S) gas is commonly detected as an odor in coastal wetland soils.

50 **Odor Intensity**

Definition: *The type of odor detected in a soil horizon.*

Population Standard: Optional

Population Guidance: Hydrogen sulfide (H_2S) gas is commonly detected as an odor in coastal wetland soils. The intensity of the odor can be correlated to the amount of H_2S in the soil.

51 **Reduced Monosulfide Presence**

Definition: *An indicator of the presence of reduced monosulfides in the soil as indicated by a soil color change within 10 seconds following the addition of 3 percent hydrogen peroxide (H2O2) solution. The color change is usually an increase in value by 2 or more units.*

Population Standard: Optional

52 **Boundary Distinctness**

Definition: *Thickness of the interface between adjacent soil horizons. (SSM)*

Population Standard: Typically populated

53 **Boundary Topography**

Definition: *Horizontal shape of the interface between adjacent soil horizons. (SSM)*

Population Standard: Typically populated

54 **Total Volume % Low**

Definition: *The low total volume percentage of the horizon in the pedon.*

Population Standard: Optional

55 **Total Volume % RV**

Definition: *The RV total volume percentage of the horizon in the pedon.*

Population Standard: Optional

56 **Total Volume % High**

Definition: *The high total volume percentage of the horizon in the pedon.*

Population Standard: Optional

57 **Lateral Area % Low**

Definition: Low p*ercentage of horizontal cross sectional area of the pedon occupied by a horizon.*

Population Standard: Optional

58 **Lateral Area % RV**

Definition: RV p*ercentage of horizontal cross-sectional area of the pedon occupied by a horizon.*

Population Standard: Optional

59 **Lateral Area % High**

Definition: Low p*ercentage of horizontal cross sectional area of the pedon occupied by a horizon.*

Population Standard: Optional

60 **Comp Layer ID**

Definition: *An arbitrary alpha and/or numeric label assigned to this horizon to indicate which horizons should be combined for analysis and data aggregation purposes.*

Population Standard: Optional

61 **AASHTO**

Definition: *A rating based on a system that classifies soils according to those properties that affect roadway construction and maintenance. Soils are classified into seven basic groups plus eight subgroups, for a total of fifteen for mineral soils. Another class for organic soils is used. The groups are based on determinations of particle-size distribution, liquid limit, and plasticity index. The group classification, including group index, is useful in determining the relative quality of the soil material for use in earthwork structures, particularly embankments, subgrades, subbases, and bases. (American Association of State Highway and Transportation Officials)*

Population Standard: Optional

62 **Unified**

Definition: *A system for classifying mineral and organo-mineral soils for engineering purposes based on particle size characteristics, liquid limit, and plasticity index.*

Population Standard: Optional

Pedon Horizon Texture

This table is used to store information about individual elements of a texture group. Entries in this table are used to calculate the texture group in the Pedon table.

1 **Texture**

Definition: *An expression, based on the USDA system of particle sizes, for the relative portions of the various size groups of individual mineral grains less than 2mm equivalent diameter in a mass of soil.*

Population Standard: Typically populated, if applicable

Population Guidance: Populate only if the In Lieu field is not used.

2 **In Lieu**

Definition: *Substitute terms applied to materials that do not fit into a textural class because of organic matter content, size, rupture resistance, solubility, or another reason.*

Population Standard: Typically populated, if applicable

Population Guidance: Populate only if the Texture field is not used.

In Lieu is used for:

- Fragmental horizons (≥ 90 percent rock fragments)
- Organic material
- Gypsiferous material
- Water

Pedon Horizon Texture Modifier

1 **Modifier**

Definition: *A term used to denote the presence of a condition or component other than sand, silt, or clay.*

Population Standard: Typically populated, if applicable

Pedon Horizon Bulk Density

This table and its child tables were originally created to store the bulk density data from the Rapid Carbon Assessment study. It can now be used to store bulk density measurements collected outside of the Rapid Carbon Assessment initiative.

Population standard for all columns in this table: Optional

1	**Depth to Top** ***(cm)***	Definition: *The depth to the top of the layer from which the bulk density sample was taken.*
2	**Depth to Bottom** ***(cm)***	Definition: *The depth to the bottom of the layer from which the bulk density sample was taken.*
3	**Method**	Definition: *The method used to obtain the bulk density sample.*
4	**Data Collector**	Definition: *Name of person(s) that collected the data. Enter complete first and last name; do not use initials.*
5	**Field Moist Volume** ***(cm^3)***	Definition: *The field moist volume of the total sample.*
6	**Field Moist Sample Wt.** ***(g)***	Definition: *The field moist weight of the total sample.*
7	**Air Dry Sample Wt** ***(g)***	Definition: *The air-dry weight of the total sample.*
8	**Field Moist Co. Fragment Wt.** ***(g)***	Definition: *The field moist weight of the coarse fragments in the sample.*
9	**Air Dry Fragment Wt.** ***(g)***	Definition: *The air-dry weight of the coarse fragments in the sample.*
10	**Fragment Density**	Definition: *The particle density of the coarse fragments in the sample.*
11	**Coarse Fragment Volume** ***(cm^3)***	Definition: *The field-measured volume of the coarse fragments in the sample.*
12	**Air Dry Subsample Wt.** ***(g)***	Definition: *The air-dry weight of the subsample.*
13	**Oven Dry Subsample Wt.** ***(g)***	Definition: *The oven-dry weight of the subsample.*
14	**Grav. Soil Moist % Whole Soil** ***(%)***	Definition: *The measured amount of water in the soil layer, expressed as a weight percentage.*
15	**Grav. Soil Moist % Fine Earth** ***(%)***	Definition: *The measured amount of water in the less than 2 mm fraction of the soil, expressed as a weight percentage.*

16 **Bulk Density FM Fine Earth** *(g/cm³)*

Definition: *The oven- dry weight of the less than 2 mm soil material per unit field moist volume of soil exclusive of the desiccation cracks.*

17 **Bulk Density FM Whole Soil** *(g/cm³)*

Definition: *The oven-dry weight of the whole soil per field moist unit volume of soil exclusive of the desiccation cracks.*

18 **Bulk Density OD Whole Soil** *(g/cm³)*

Definition: *The oven-dry weight of the whole soil per unit volume of soil exclusive of the desiccation cracks.*

19 **Bulk Density OD Fine Earth** *(g/cm³)*

Definition: *The oven-dry weight of the less than 2 mm fraction of the soil material per unit volume of soil exclusive of the desiccation cracks.*

20 **Bulk Density Satiated** *(g/cm³)*

Definition: *The oven-dry weight of the less than 2 mm fraction of the soil material per unit volume of soil at a water tension of 0 bar.*

Pedon Horizon Bulk Density Core

Population standard for all columns in this table: Optional

1 **Total Tube Length** *(cm)*

Definition: *The overall length of the sample tube used.*

2 **Unfilled Tube Length** *(cm)*

Definition: *The average length of the part of the tube not filled with the soil sample.*

3 **Core Sample Length** *(cm)*

Definition: *The length of the core sample collected.*

4 **Tube Diameter** *(cm)*

Definition: *The inside diameter of the cutting edge of the sample tube.*

5 **Core Sample Volume** *(cm³)*

Definition: *The computed volume of the soil core sample.*

Pedon Horizon Bulk Density Core Reading

1 **Unfilled Tube Length** *(cm)*

Definition: *An individual measurement of the length of the unfilled part of the sample tube. The average of these values for a particular sample is recorded in the Bulk Density Core table.*

Population Standard: Optional

Pedon Horizon Bulk Density Compliant Cavity

Population standard for all columns in this table: Optional

1	**Cavity Diameter** *(cm)*	Definition: *The cross-sectional diameter of the compliant cavity frame opening.*
2	**Cavity Length** *(cm)*	Definition: *The cross-sectional length of the compliant cavity frame opening.*
3	**Cavity Width** *(cm)*	Definition: *The cross-sectional width of the compliant cavity frame opening.*
4	**Cavity Initial Volume** *(cm3)*	Definition: *The measured or computed volume of the cavity before excavation of the solid sample.*
5	**Cavity Final Volume** *(cm^3)*	Definition: *The measured or computed volume of the cavity after excavation of the soil sample.*
6	**Cavity Depth Pre Dig** *(cm)*	Definition: *The average distance from a standard reference point on the frame used in the bulk density cavity method to the top of the soil surface prior to any soil excavation.*
7	**Cavity Depth Post Dig** *(cm)*	Definition: *The average distance from a standard reference point on the frame used in the bulk density cavity method to the top of the soil surface after soil excavation.*
8	**Sample Volume** *(cm^3)*	Definition: *The volume of the soil sample removed.*

Pedon Horizon Bulk Density Scoop

Population standard for all columns in this table: Optional

1	**Scoop Length** *(cm)*	Definition: *The length of the scoop used to extract the sample.*
2	**Scoop Width** *(cm)*	Definition: *The width of the scoop used to extract the sample.*
3	**Scoop Depth** *(cm)*	Definition: *The depth of the scoop used to extract the sample.*
4	**Scoop Volume** *(cm^3)*	Definition: *The total volume of the scoop.*
5	**Scoop Depth Unfilled** *(cm)*	Definition: *The average depth of the part of the scoop not filled with the soil sample.*
6	**Sample Volume** *(cm^3)*	Definition: *The computed volume of soil material removed.*

Pedon Horizon Bulk Density Scoop Reading

1 **Unfilled Scoop Depth** *(cm)*

Definition: *An individual depth measurement of the unfilled part of the scoop. The average of these values for a particular sample is recorded in the Pedon Bulk Density Scoop table.*

Population Standard: Optional

Pedon Horizon Cementing Agent

Populated for horizons that have a degree of cementation from carbonates, gypsum, silica, iron, and/or hummus (FBDSS).

1 **Cementing Agent**

Definition: *Any substance that bonds soil particles into hard, brittle masses that persist even when wet.*

Population Standard: Typically populated, if applicable

Pedon Horizon Color

Typically, a dry color and a moist color are recorded in this table *(FBDSS).*

Note: Colors listed are for the soil matrix only. Colors of mottles, concentrations, and redoximorphic features, etc., are recorded in their respective tables. Variegated colors are denoted in the Pedon Horizon table.

1 **Color %**

Definition: *Percent of the soil specimen occupied by a particular color.*

Population Standard: Optional

2 **Hue**

Definition: *A measure of the dominant wavelength of light using Munsell notation system.*

Population Standard: Typically populated

3 **Value**

Definition: *A measure of the lightness of soil color relative to neutral gray using the Munsell notation system.*

Population Standard: Typically populated

4 **Chroma**

Definition: *A measure of the relative strength of a spectral color using the Munsell notation system.*

Population Standard: Typically populated

5 **Phys State**

Definition: *The physical condition or location of the soil sample used to determine soil color.*

Population Standard: Typically populated

6 **Moist State**

Definition: *An estimate of the amount of water held within a soil sample in relation to its effect on reflectance of light. Expressed as either moist or dry.*

Population Standard: Typically populated

Pedon Horizon Concentrations

This table is used to record a description of concentrations, other than those described as redoximorphic features, that may occur in each horizon. A separate row/record is used to describe each different size or kind of concentration *(SSM and FBDSS).*

Population standard for all columns in this table: Typically populated, if applicable

1 **Percent**

Definition: *The amount (percent) of accumulated or segregated materials present based on the percentage of surface area covered of a broken face specimen sample. The observation is made without rubbing or smoothing the face in any manner.*

2 **Size**

Definition: *The dimension of the concentration, in which the measurement is dependent upon the concentration shape. (SSM)*

3 **Contrast**

Definition: *The degree of visual distinction that is evident at the interface between the concentration and the surrounding soil. (SSM)*

4 **Hardness**

Definition: *The degree to which a concentration resists crushing.*

5 **Shape**

Definition: *A description of the multiaxial shape of the concentration.*

6 **Kind**

Definition: *Any relatively homogeneous accumulation or segregation of substance dissimilar to the surrounding matrix. (SSM) Includes both pedogenic and non-pedogenic substances.*

7 **Location**

Definition: *Thickness of the gradation in color between the concentration and adjacent soil color. (SSM)*

8 **Boundary**

Definition: *Thickness of the gradation in color between the concentration and adjacent soil color (SSM).*

Pedon Horizon Concentrations Color

This table is used to record the color of concentrations, other than those described as redoximorphic features, that may occur in each horizon.

1	**Color %**	Definition: *Percent of the soil specimen occupied by a particular color.* Population Standard: Optional
2	**Hue**	Definition: *A measure of the dominant wavelength of light using Munsell notation system.* Population Standard: Typically populated
3	**Value**	Definition: *A measure of the lightness of soil color relative to neutral gray using the Munsell notation system.* Population Standard: Typically populated
4	**Chroma**	Definition: *A measure of the relative strength of a spectral color using the Munsell notation system.* Population Standard: Typically populated
6	**Moist State**	Definition: *An estimate of the amount of water held within a soil sample in relation to its effect on reflectance of light. Expressed as either moist or dry.* Population Standard: Typically populated

Pedon Horizon Cracks

This table is used to record a description of cracks in the soil profile *(FBDSS).*

Population standard for all columns in this table: Optional

1	**Frequency** ***(count/m)***	Definition: *The average number of cracks, per meter, observed across the soil profile as determined by a line-intercept method. Multiple measurements are taken, then averaged for recording. For surface horizons this is measured on a horizontal plane of the soil surface before disturbing the soil. For subsurface horizons it is measured on a vertical plane of the soil exposure.*
2	**Kind**	Definition: *The kind of crack being described.*
3	**Depth** ***(cm)***	Definition: *The average apparent depth, measured in centimeters from the soil surface, to which a surface connected crack extends into the soil as determined by the wire-insertion method (about 2 mm. diameter wire). This method commonly gives a standard but conservative measure or the actual fracture depth. Do not record for cracks that are not open to the soil surface.*
4	**Width** ***(cm)***	Definition: *The average width of cracks described in the soil horizon or layer, measured in centimeters.*

5	**Extends to Horizon Above?**	Definition: *An indicator that the described crack extends from the horizon being described to the horizon above.*
6	**Extends to Horizon Below?**	Definition: *An indicator that the described crack extends from the horizon being described to the horizon below.*

Pedon Horizon Designation Suffix

This table is used to record the horizon designation suffix for the horizon. Populate this table before calculating the pedon horizon designation.

1	**Suffix**	Definition: *One of the four kinds of symbols, that when concatenated, are used to distinguish different kinds of layers in soils. Letter suffixes are used to designate subordinate distinctions within master horizons and layers using lowercase letters. (SSM)* Population Standard: Typically populated, if applicable Population Guidance: Enter as many as apply. Make a separate record for each suffix.

Pedon Horizon Features

This table is used to record a description of special features, such as lamellae, plinthite, and albic tongues *(FDBSS).*

Population standard for all columns in this table: Typically populated, if applicable

1	**Kind**	Definition: *A descriptive term or phrase used to express differences between the horizon feature and the soil matrix.*
2	**Total Volume % - Low**	Definition: *The low volume percentage of the feature in the horizon.*
3	**Total Volume % - RV**	Definition: *The RV volume percentage of the feature in the horizon.*
4	**Total Volume % - High**	Definition: *The high volume percentage of the feature in the horizon.*
5	**Lateral Area %- Low**	Definition: *Low percentage of horizontal cross-sectional area of the horizon feature.*
6	**Lateral Area % - RV**	Definition: *RV percentage of horizontal cross-sectional area of the horizon feature.*
7	**Lateral Area % - High**	Definition: *High percentage of horizontal cross-sectional area of the horizon feature.*

Pedon Horizon Features Color

This table is used to record the color of the horizon feature.

1	**Color %**	Definition: *Percent of the soil specimen occupied by a particular color.* Population Standard: Optional
2	**Hue**	Definition: *A measure of the dominant wavelength of light using Munsell notation system.* Population Standard: Typically populated
3	**Value**	Definition: *A measure of the lightness of soil color relative to neutral gray using the Munsell notation system.* Population Standard: Typically populated
4	**Chroma**	Definition: *A measure of the relative strength of a spectral color using the Munsell notation system.* Population Standard: Typically populated
6	**Moist State**	Definition: *An estimate of the amount of water held within a soil sample in relation to its effect on reflectance of light. Expressed as either moist or dry.* Population Standard: Typically populated

Pedon Horizon Field Measured Property

This table is used to record the horizon field-measured properties.

Population standard for all columns in this table: Optional

1	**Name**	Definition: *The name assigned to a user-defined, field-measured property. To be used when the parameter to be recorded does not already exist elsewhere in the database.* Population Guidance: Freeform text field for populating the name assigned to a user-defined, field-measured property. **Use only if the parameter to be recorded does not already exist elsewhere in the database.**
2	**Value**	Definition: The measured or observed value of the specific user-defined parameter.
3	**Unit of Measure**	Definition: The unit of measure associated with a particular field measurement.

Pedon Horizon Fragments

This table is used to record the fragments in the horizon. Enter a new row for each fragment class. For example, if gravel and cobbles are both in a horizon, two records are entered in this table.

Pedon Horizon Fragments | Pedon Horizon Human Artifacts | Pedon Horizon Ksat Summary | Pedon Horizon Lab Results | Pedon Hor

				Size							
	Seq	Vol %	Weight %	Low	RV	High	Kind	Shape	Roundness	Hardness	Estimate Method
N		20.0		2		75	basalt	nonflat	rounded	indurated	visual inspection
N		10.0		75		250	basalt	nonflat	rounded	indurated	visual inspection

The NSSH defines fragments as "unattached, cemented pieces of bedrock, bedrock-like material, durinodes, concretions, nodules, or pedogenic horizons (e.g., petrocalcic fragments) 2 mm or larger in diameter and woody material 20 mm or larger in diameter in organic soils. Fragments are separated into three types—rock fragments, pararock fragments (distinguished by cementation class), and wood fragments."

1 **Vol %**

Definition: *The volume percentage of the horizon consisting of the 2 mm fraction or larger (20 mm or larger for wood fragments), on a whole soil basis.*

Population Standard: Typically populated

2 **Weight %**

Definition: *The weight percentage of the horizon consisting of the 2 mm fraction or larger (20 mm or larger for wood fragments), on a whole soil basis.*

Population Standard: Optional

Use the USDA fragment classes for columns 3-5. The screenshot below provides a list of the fragment classes and their breaks *(NSSH and FBDSS).*

Flat fragment classes are:

Flat fragment class	Length of fragment (mm)
Channers	2-150
Flagstones	150-380
Stones	380-600
Boulders	≥600

Nonflat fragment classes are:

Nonflat fragment class	Diameter (mm)
Gravel	2-75
Fine gravel	2-5
Medium gravel	5-20
Coarse gravel	20-75
Cobbles	75-250
Stones	250-600
Boulders	≥600

3 **Size Low** *(mm)*

Definition: *The low size that corresponds to the USDA classes for fragments.*

Population Standard: Typically populated

4 **Size RV** *(mm)*

Definition: *The relative value. This RV value must be between the low and high values.*

Population Standard: Typically populated

5 **Size High** *(mm)*

Definition: *The high size that corresponds to the USDA classes for fragments.*

Population Standard: Typically populated

6 **Kind**

Definition: *The lithology/composition of the 2 mm or larger fraction of the soil (20 mm or larger for wood fragments).*

Population Standard: Typically populated

Population Guidance: If more than one kind of fragment is observed, enter a separate record for each kind. For example, if a horizon has a combined total of 20% basalt and sandstone gravel, enter 10% basalt gravel and 10% sandstone gravel. Do not enter 20% basalt gravel and 20% sandstone gravel.

7 **Shape**

Definition: *A description of the overall shape of the fragment.*

Population Standard: Typically populated

8 **Roundness**

Definition: *An expression of the sharpness of edges and corners of fragments. (Sedimentary Rocks, Pettijohn, 1957)*

Population Standard: Typically populated

9	**Hardness**	Definition: *The hardness of fragments (FBDSS).* Population Standard: Typically populated
10	**Estimate Method**	Definition: *The method used to estimate horizon fragment content.* Population Standard: Typically populated

Pedon Horizon Human Artifacts

This table is used to record the human artifacts in the horizon. Human artifacts typically are in anthropogenic soils, such as urban soils or reclaimed mine soils. If this table is populated, the "u" horizon designation suffix must be used. Additionally, the carrot symbol (^) and "M" master horizon designations should be considered for use (*KST*).

Population standard for all columns in this table: Optional

1	**Vol %** *(%)*	Definition: *The volume percentage of the horizon occupied by discrete human artifacts.*
2	**Size Low** *(mm)*	Definition: *The low size of the described artifact, expressed as a class.*
3	**Size RV** *(mm)*	Definition: *The RV size of the described artifact, expressed as a class. If the artifact is nearly uniform, size is measured in the shortest dimension, such as the effective diameter of a cylinder or the thickness of a plate. For elongated or irregular bodies, size refers to the longest dimension unless that creates an erroneous impression, in which case direct measurements for 2 or 3 dimensions can be given if needed.*
4	**Size High** *(mm)*	Definition: *The high size of the described artifact, expressed as a class.*
5	**Kind**	Definition: *The type of object or material being described. These were created (or modified) by humans for practical purposes related to activities such as manufacturing, construction, or waste disposal. Examples of artifacts include processed wood products, liquid petroleum products, coal combustion by-products, asphalt, fibers and fabrics, bricks, cinder blocks, concrete, plastic, glass, rubber, paper, cardboard, iron and steel, altered or manufactured metals and minerals, sanitary and medical waste, garbage, and landfill waste.*
6	**Cohesion**	Definition: *Cohesion refers to the relative ability of the artifact to remain intact after significant disturbance.*
7	**Shape**	Definition: *A description of the overall shape of the artifacts.*
8	**Roundness**	Definition: *An expression of the sharpness of the edges and corners of the artifacts.*

9	**Penetrability**	Definition: *The relative ease that roots can penetrate the artifacts and potentially extract any stored moisture, nutrients, or toxic elements.*
10	**Safety**	Definition: *The degree of risk to humans from contact with the artifacts. Physical contact with soils containing dangerous or harmful artifacts should be avoided unless proper training is available and protective clothing is worn.*
11	**Persistence**	Definition: *The relative ability of solid artifacts to withstand weathering over time.*

Pedon Horizon Ksat Summary

Saturated hydraulic conductivity (Ksat) is the ease with which pores of a saturated soil transmit water. This table is used to record the summary results of the Ksat measurements from single ring, double ring, or Amoozemeter method. *(NSSH)*

Population standard for all columns in this table: Optional

1	**Test Date**	Definition: *The date the test was conducted.*
2	**Data Collector**	Definition: *The name of the person collecting the measurements or observations.*
3	**Ksat Mean** *(um/s)*	Definition: *The arithmetic mean of saturated hydraulic conductivity (Ksat) rates obtained from the various replications of a Ksat measurement test at a particular location on a particular date.*
4	**Ksat Std Dev** *(um/s)*	Definition: *The statistical standard deviation of the calculated mean saturated hydraulic conductivity (Ksat) obtained from the various replications of a Ksat test at a particular location on a particular date.*
5	**Test Method**	Definition: *The field method used to measure Ksat (saturated hydraulic conductivity).*

Pedon Horizon Ksat Amoozemeter

This table is used to record the raw Ksat data from the Amoozemeter method. Do not populate if measuring Ksat by the double ring or single ring method.

Population standard for all columns in this table: Optional

1	**Rep #**	Definition: *The unique number assigned to a particular replicate measurement or test within a study.*

2	**Test Date**	Definition: *The date the test was conducted.*
3	**Ksat Mean** *(um/s)*	Definition: *The average of steady-state Ksat measurements obtained from an Amoozemeter replicate run.*
4	**Ksat Std. Dev.** *(um/s)*	Definition: *The standard deviation of the Ksat obtained from an Amoozemeter replicate run.*
5	**Ksat Class**	Definition: *The Ksat class assigned based on the mean Ksat value.*
6	**Borehole Depth** *(cm)*	Definition: *The overall depth of the borehole measured from the soil surface.*
7	**Borehole Radius** *(cm)*	Definition: *The radius of the borehole.*
8	**Initial Water Level** *(cm)*	Definition: *The initial water level in the borehole.*
9	**Final Water Level** *(cm)*	Definition: *The final water level in the borehole.*
10	**Notes**	Definition: *Notes describing decisions, issues, or other history related to the record.*

Pedon Horizon Ksat Amoozemeter Data

This table is used to record the actual raw Amoozemeter readings from a specific Ksat run. Do not populate if measuring Ksat by the double ring or single ring method.

Population standard for all columns in this table: Optional

1	**Reading #**	Definition: *The number of an individual Ksat reading.*
2	**Water Drop** *(cm)*	Definition: *The drop in water level measured during a time interval.*
3	**Delta Time** *(min)*	Definition: *The elapsed time between readings, reported in decimal minutes.*
4	**Conversion Factor** *(cm^2)*	Definition: *The conversion factor for the small Amoozemeter outflow chamber.*

5	**Ksat Measured** *(um/s)*	Definition: *A field Ksat measurement associated with each drop in water level during the time interval recorded.*
6	**Steady State ?**	Definition: *An indicator of whether steady state has been achieved or not. "Yes" indicates that a steady state has been achieved, and "no" indicates that it has not been achieved yet.*

Pedon Horizon Ksat Ring

This table is used to record the raw data from a specific Ksat run using the double ring method. Do not populate if Ksat was measured by the Amoozemeter method.

Population standard for all columns in this table: Optional

1	**Rep #**	Definition: *The unique number assigned to a particular replicate measurement or test within a study.*
2	**Test Date**	Definition: *The date the test was conducted.*
3	**Ksat Mean** *(um/s)*	Definition: *The average of steady-state Ksat measurements obtained from a double ring replicate run.*
4	**Ksat Std. Dev.** *(um/s)*	Definition: *The statistical standard deviation of the calculated mean Ksat obtained from a double ring replicate run.*
5	**Ksat Class**	Definition: *The Ksat class assigned based on the mean measured Ksat value.*
6	**Ring Configuration**	Definition: *The configuration of the ring used to measure Ksat in the field.*
7	**Ring Insertion Depth** *(cm)*	Definition: *The depth to which the ring is inserted or driven into the soil.*
8	**Ring Radius** *(cm)*	Definition: *The inside radius of the ring (inner ring for double ring configuration).*
9	**Water Ponding Depth** *(cm)*	Definition: *The depth from the top of the soil to the top of the water ponded on the soil inside the ring (inner ring for double ring configuration).*
10	**Mariotte Bottle Radius** *(cm)*	Definition: *The inside radius of the Mariotte bottle or reservoir.*

11	**Texture/Structure Category**	Definition: *An input parameter to the Ksat calculation that indicates the type of soil structure and texture of the soil material being evaluated.*
12	**Notes**	Definition: *Notes describing decisions, issues, or other history related to the record.*

Pedon Horizon Ksat Ring Data

This table is used to record the actual raw double ring readings for a specific Ksat run. Do not populate if Ksat was measured by the Amoozemeter method.

Population standard for all columns in this table: Optional

1	**Reading #**	Definition: *The number of an individual Ksat reading.*
2	**Water Drop** *(cm)*	Definition: *The drop in water level measured during a time interval.*
3	**Delta Time** *(min)*	Definition: *The elapsed time between readings, reported in decimal minutes.*
4	**Ksat Measured** *(um/s)*	Definition: *A field Ksat measurement associated with each drop in water level during the time interval recorded.*
5	**Steady State ?**	Definition: *An indicator of whether a steady state has been achieved or not. "Yes" indicates that a steady state has been achieved, and "no" indicates that it has not been achieved yet.*

Pedon Horizon Lab Results

This table is used to record chemical and physical properties measured in the field soil survey office. This table DOES NOT store results from KSSL analyses. It is designed to store the results from analyses conducted in the soil survey office by the field soil scientist.

Population standard for all columns in this table: Optional

1	**Top Depth** *(cm)*	Definition: *The depth to the top of the sample*
2	**Bottom Depth** *(cm)*	Definition: *The depth to the bottom of the sample.*
3	**Sample ID**	Definition: *The sample ID created by the soil survey office.*

4	**Data Collector**	Definition: *Name of person(s) that collected the measurements. Enter complete first and last name; do not use initials.*
5	**Total Clay - Measured** *(%)*	Definition: *Total clay content as determined by SSIR51V1-3.2.1.2.1 Hydrometer Analysis for Routinely Reported Size Fractions (D 422-63 [ASTM, 2008c]).*
6	**CaCO3 Clay - Measured** *(%)*	Definition: *The field lab-measured carbonate clay content.*
7	**Total Silt - Measured** *(%)*	Definition: *Total silt content as determined by SSIR51V1-3.2.1.2.1 Hydrometer Analysis for Routinely Reported Size Fractions (D 422-63 [ASTM, 2008c]).*
8	**Fine Silt - Measured** *(%)*	Definition: *Total fine silt content as determined by SSIR51V1-3.2.1.2.1 Hydrometer Analysis (D 422-63 [ASTM, 2008c]).*
9	**Co. Silt - Measured** *(%)*	Definition: *Total coarse silt content as determined by SSIR51V1-3.2.1.2.1 Hydrometer Analysis (D 422-63 [ASTM, 2008c]).*
10	**Total Sand - Measured** *(%)*	Definition: *Total sand content as determined by SSIR51V1-3.2.1.2.1 Hydrometer Analysis for Routinely Reported Size Fractions (D 422-63[(ASTM, 2008c]) using sieves or a hydrometer.*
11	**Total Sand Method**	Definition: *The method used to measure total sand content.*
12	**VC Sand - Measured** *(%)*	Definition: *Very coarse sand content (1 mm to 2 mm) of the <2 mm fraction that passes the #10 sieve and is retained on the #18 sieve as determined by SSIR51V1-3.2.1.2 Laboratory Analysis of Particles < 2 mm.*
13	**Co. Sand - Measured** *(%)*	Definition: *Coarse sand content (0.5 mm to 1.0 mm) of the <2 mm fraction that passes the #18 sieve and is retained on the #35 sieve as determined by SSIR51V1-3.2.1.2 Laboratory Analysis of Particles < 2mm.*
14	**Med. Sand - Measured** *(%)*	Definition: *Medium sand content (0.25 mm to 0.5 mm) of the <2 mm fraction that passes the #35 sieve and is retained on the #60 sieve as determined by SSIR51V1-3.2.1.2 Laboratory Analysis of Particles < 2 mm.*
15	**Fine Sand - Measured** *(%)*	Definition: *Fine sand content (0.1 mm to 0.25 mm) of the <2 mm fraction that passes the #60 sieve and is retained on the #140 sieve as determined by SSIR51V1-3.2.1.2 Laboratory Analysis of Particles <2 mm.*
16	**VF Sand - Measured** *(%)*	Definition: *Very fine sand content (.05 mm to 0.1 mm fraction) as determined by SSIR51V1-3.2.1.2.1 Hydrometer Analysis (D 422-63 [ASTM, 2008c]) using sieves.*
17	**VF Sand Method** *(%)*	Definition: *The method used to measure very fine sand content.*

18	**Texture Class - Field Lab**	Definition: *An expression, based on the USDA system of particle sizes, for the relative portions of the various size groups of individual mineral grains less than 2 mm equivalent in diameter in a mass of soil as determined by using field laboratory methods.*
19	**Rubbed Fiber %**	Definition: *The proportion of organic soil material that is composed of fibers, reported as a percent by volume of the less than 20 mm fraction after rubbing between the thumb and fingers.*
20	**Unrubbed Fiber 5**	Definition: *The proportion of organic soil material composed of fibers, reported as a percent by volume of the less than 20 mm fraction before rubbing between thumb and fingers.*
21	**pH 1:1 water**	Definition: *The negative common logarithm of the hydrogen ion activity in the soil using the 1:1 soil-water ratio method. A numerical expression of the relative acidity or alkalinity of a soil sample (SSM).*
22	**pH .01M CaCl2**	Definition: *The negative common logarithm of the hydrogen ion activity in the soil using the 0.01 M CaCl2 method, in a 1:2 soil-solution ratio. A numerical expression of the relative acidity or alkalinity of a soil sample (SSM).*
23	**pH NaF**	Definition: *The negative common logarithm of the hydrogen ion activity in the soil using the 1N NaF method. It is used as an indicator of andic material.*
24	**pH Oxidized**	Definition: *The negative common logarithm of the hydrogen ion activity in the soil using the oxidized pH method. It is used as an indicator of the presence of sulfidic material. This is the final pH measured after several moist/dry cycles when using SSIR51V1-7.1.3.1 Hydrogen Peroxide Test, Delta pH test for Acid Sulfate Soils.*
25	**Delta pH - H2O2**	Definition: *The difference in pH obtained by using SSIR51V1-7.1.3.1 Hydrogen Peroxide Test, Delta pH for Acid Sulfate Soils.*
26	**LL - Measured** **(%)**	Definition: *The measured water content of the soil, expressed as dry weight, at the change between the liquid and plastic states.*
27	**PL - Measured** **(%)**	Definition: *The measured water content of the soil, expressed as dry weight, at the change between the semisolid and plastic states.*
28	**PI** **(%)**	Definition: *The numerical difference between the liquid limit and plastic limit.*
29	**Atterberg Sample Condition**	Definition: *The beginning soil moisture condition of the sample used for Atterberg limit determination (liquid limit, plastic limit, and plasticity index).*

30	**COLE** *(cm/cm)*	Definition: *Coefficient of Linear Extensibility as determined by using SSIR51V1-3.5.4, reported.*
31	**Est. Pot. Acidity - ETPA** *(meq/100g)*	Definition: *Estimated Total Potential Acidity;an estimate of the amount of acidity that may be produced from the oxidation of sulfidic material determined by using SSIR51V1-7.1.3.2*
32	**Ca + Mg - Meh 2** *(cmol(+)/kg)*	Definition: *Mehlich No. 2 calcium plus magnesium content using a 0.0075 N EDTA titration (HACH Co., 1992a).*
33	**Potassium - Meh 2** *(cmol(+)/kg)*	Definition: *Mehlich No. 2 potassium content using turbidmetric tetraphenyborate (HACH Co., 1992a).*
34	**Ca + Mg - Sat. Paste** *(mmol(+)/l)*	Definition: *Calcium plus magnesium content determined by using the saturated paste extraction technique (SSIR51V1-4.6.2.1.2 0.0075 N EDTA Titration) (HACH Co., 1992a).*
35	**KCl Extract. Acidity** *(cmol(+)/kg)*	Definition: *Extractable acidity using 1N KCl (HACH Co., 1992a).*
36	**Base Sat. - Meh 2** *(%)*	Definition: *Base saturation determined by using the sum of Mehlich No. 2 extractable bases plus N KCl extractable acidity (HACH Co., 1992a).*
37	**CEC – 7**	Definition: *The amount of readily exchangeable cations that can be electrically adsorbed to negative charges in the soil, soil constituent, or other material, at pH 7.0, as estimated by the ammonium acetate method. Previously reported as meq/100 g which is equivalent to cmol+/kg.*
38	**CEC -8.2**	Definition: *The sum of cations computed by summing KCl-TEA, pH 8.2, extractable bases and KCl-TEA, pH 8.2, extractable acidity. Ref. SSIR 51-4.1.5.1.1. The CEC value produced is approximately equivalent to the CEC measured in the SSL using NH4-acetate pH 7.0.*
39	**ECEC**	Definition: *The sum of NH4OAc extractable bases plus KCl extractable aluminum. Previously reported as meq/100 g, which is equivalent to cmol+/kg.*
40	**Phosphate Phosphorous** *(mg/kg)*	Definition: *Phosphate phosphorus content determined by using the ascorbic acid method (HACH Co., 1992b).*
41	**NO3-N** *(mg/kg)*	Definition: *Nitrate-nitrogen content by calcium-sulfate extraction determined by using the Cadmium-Reduction Method (HACH Co. 1992b).*
42	**EC**	Definition: *The electrical conductivity of an extract from saturated soil paste using the pocket-type or hand-held electrical conductivity meter.*

43	**EC Method**	Definition: *The method used to measure the electrical conductivity of the soil.*
44	**EC 1:5 by volume**	Definition: *The electrical conductivity of an extract from a 1:5 volumetric dilution of soil to water.*
45	**CaCO3 Equiv. Measured** *(%)*	Definition: *The quantity of carbonate (CO3) in the soil, expressed as CaCO3 and as a weight percentage of the less than 2 mm fraction. Calcium carbonate equivalent measured by using a volume calcimeter (Holmgren, 1973).*
46	**Equiv. Gypsum** *(%)*	Definition: *The weight percentage of gypsum and other water-soluble minerals in the soil as measured by using the SSIR51V1-4.5.4.1 Equivalent Gypsum Content, Semiquantitative method.*
47	**Sodium** *(mmol(+)/l)*	Definition: *Sodium content determined by using the Saturated Paste and Ion Electrode method (HACH Co., 1999-2000).*
48	**SAR**	Definition: *A measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste (Soil Survey Staff, 2004, method 4F3b).*
49	**Gypsum Req.** *(cmol(+)/kg)*	Definition: *The amount of gypsum needed to replace exchangeable sodium as determined by the Gypsum Requirement and Exchangeable Sodium using the Saturated Calcium Sulfate Extraction method (SSIR51V1-4.6.4.2.12) (HACH Co., 1992a).*
50	**Humic Color** *(L-pcu/g)*	Definition: *Humic color using the 4 N HCl treatment and the AMP Buffer Hardness Solution. The color is obtained by comparing a solution to a set of reference standards. It is reported in liter-platinum color units per gram (L-pcu/g).*
51	**Fulvic Color** *(L-pcu/g)*	Definition: *Fulvic color using the 4 N HCl treatment and the AMP Buffer Hardness Solution. The color is obtained by comparing a solution to a set of reference standards.*
52	**Humic+Fulvic Color** *(L-pcu/g)*	Definition: *Humic-fulvic color using the 4 N HCl treatment and the AMP Buffer Hardness Solution (SSIR51V1-4.7.1.1). The color is obtained by comparing a solution to a set of reference standards. It is reported in liter-platinum color units per gram.*
53	**Aluminum** *(%)*	Definition: *Aluminum content determined from the 4 N Potassium Hydroxide Extraction method SSIR51V1-4.7.2.1).*
54	**Pyrophosphate Hue**	Definition: *The Munsell color hue resulting from the pyrophosphate test. It is an indication of the decomposition state of the organic material.*
55	**Pyrophosphate Value**	Definition: *The Munsell color value resulting from the pyrophosphate test. It is an indication of the decomposition state of the organic material.*

56 **Pyrophosphate Chroma** Definition: *The Munsell color chroma resulting from the pyrophosphate test. It is an indication of the decomposition state of the organic material.*

57 **Melanic Index** Definition: *The melanic index is related to the ratio of the humic and fulvic acids in the organic fraction of the soil. The index is used to distinguish humified organic matter thought to result from large amounts of gramineous vegetation from humified organic matter from forest vegetation. The melanic index is calculated as the absorbance of the extracting solution at wavelength 450 nm over the absorbance at wavelength 520 nm.*

Pedon Horizon Hydrometer Analysis

Population standard for all columns in this table: Optional

1 **Test Date** Definition: *The date the test was conducted.*

2 **Sample Weight** *(g)* Definition: *Sample weight used while running Hydrometer Analysis for Routinely Reported Size Fractions (D 422-63 [ASTM, 2008c]) Sodium Hexametaphosphate Dispersible (SSIR51V1-3.2.1.2.1.1).*

3 **SHMP Concentration** *(g/ml)* Definition: *Concentration of the sodium hexametaphosphate solution used while running Hydrometer Analysis for Routinely Reported Size Fractions (D 422-63 [ASTM, 2008c]) Sodium Hexametaphosphate Dispersible (SSIR51V1-3.2.1.2.1.1).*

4 **Blank Reading** *(g/l)* Definition: *The hydrometer reading recorded for a sample tube with no soil added.*

5 **Method** Definition: *Hydrometer analysis method used for Routinely Reported Size Fractions (D 422-63 [ASTM, 2008c]) Sodium Hexametaphosphate Dispersible.*

6 **Grav. Soil Moist % Whole Soil** *(%)* Definition: *The measured amount of water in the soil layer, expressed as a weight percentage.*

Pedon Horizon Hydrometer Data

Population standard for all columns in this table: Optional

1 **Reading #** Definition: *The sequential number of each hydrometer reading for a particular soil sample.*

2 **Delta Time** *(min)* Definition: *The elapsed time between readings.*

3 **Temperature** Definition: *The temperature of the water in the hydrometer jar.*

(°C)

4	**Hydrometer Reading** *(g/l)*	Definition: *Hydrometer reading obtained while running Hydrometer Analysis for Routinely Reported Size Fractions (D 422-63 [ASTM, 2008c]) Sodium Hexametaphosphate Dispersible.*

Pedon Horizon COLE Data

Population standard for all columns in this table: Optional

1	**Rep #**	Definition: *The unique number assigned to a particular replicate measurement or test within a study.*
2	**COLE Reading** *(cm/cm)*	Definition: *Coefficient of linear extensibility (COLE) value from an individual clod, rod, or soil mold as determined by SSIR51V1-3.5.4.*
3	**COLE Method**	Definition: *The method used to measure COLE.*

Pedon Horizon Grain Count Summary

Population standard for all columns in this table: Optional

1	**Quartz**	Definition: *The number of quartz grains counted in the sample using method SSIR51V1-7.2.2.1.2 Grain Mounts, Epoxy optical analysis and interpretation.*
2	**Micaceous**	Definition: *The number of micaceous mineral grains counted in the sample using method SSIR51V1-7.2.2.1.2 Grain Mounts, Epoxy optical analysis and interpretation.*
3	**Glass**	Definition: *The number of glass grains counted in the sample using method SSIR51V1-7.2.2.1.2 Grain Mounts, Epoxy optical analysis and interpretation.*
4	**Glass Coated Minerals**	Definition: *The number of glass-coated mineral grains counted in the sample using method SSIR51V1-7.2.2.1.2 Grain Mounts, Epoxy optical analysis and interpretation.*
5	**Glass Aggregate**	Definition: *The number of glass aggregate grains counted in the sample using method SSIR51V1-7.2.2.1.2 Grain Mounts, Epoxy optical analysis and interpretation.*
6	**Other Minerals**	Definition: *The number of other mineral grains counted in the sample using method SSIR51V1-7.2.2.1.2 Grain Mounts, Epoxy optical analysis and interpretation.*

Pedon Horizon Grain Count Data

Population standard for all columns in this table: Optional

1	**Test Date**	Definition: *The date the test was conducted.*
2	**Rep #**	Definition: *The unique number assigned to a particular replicate measurement or test within a study.*
3	**Total Grain Count**	Definition: *The total number of grains counted in the sample using method SSIR51V1-7.2.2.1.2 Grain Mounts, Epoxy optical analysis and interpretation.*
4	**Quartz**	Definition: *The number of quartz grains counted in the sample using method SSIR51V1-7.2.2.1.2 Grain Mounts, Epoxy optical analysis and interpretation.*
5	**Micaceous**	Definition: *The number of micaceous mineral grains counted in the sample using method SSIR51V1-7.2.2.1.2 Grain Mounts, Epoxy optical analysis and interpretation.*
6	**Glass**	Definition: *The number of glass grains counted in the sample using method SSIR51V1-7.2.2.1.2 Grain Mounts, Epoxy optical analysis and interpretation.*
7	**Glass Coated Minerals**	Definition: *The number of glass-coated mineral grains counted in the sample using method SSIR51V1-7.2.2.1.2 Grain Mounts, Epoxy optical analysis and interpretation.*
8	**Glass Aggregate**	Definition: *The number of glass aggregate grains counted in the sample using method SSIR51V1-7.2.2.1.2 Grain Mounts, Epoxy optical analysis and interpretation.*
9	**Other Minerals**	Definition: *The number of other mineral grains counted in the sample using method SSIR51V1-7.2.2.1.2 Grain Mounts, Epoxy optical analysis and interpretation.*

Pedon Horizon Mottles

This table records information about areas of color that differ from the matrix color due to lithochromic or lithomorphic influences. Mottles exclude redoximorphic features and ped and void surface features *(FBDSS).*

Population standard for all columns in this table: Typically populated, if applicable

1	**Percent**	Definition: *Percentage of the soil horizon that consists of mottles.*

2	**Size**	Definition: *The specified range in dimensions of a mottle as seen on a plane surface.*
3	**Contrast**	Definition: *The degree of visual distinction that is evident at the interface between the mottle and the surrounding soil (SSM).*
4	**Hue**	Definition: *A measure of the dominant wavelength of light using Munsell notation system.*
5	**Value**	Definition: *A measure of the lightness of soil color relative to neutral gray using the Munsell notation system.*
6	**Chroma**	Definition: *A measure of the relative strength of a spectral color using the Munsell notation system.*
7	**Shape**	Definition: *The shape of a mottle.*
8	**Moist State**	Definition: *Enter either moist or dry.*
9	**Location - obsolete**	Definition: *The location of a mottle.* Population Standard: DO NOT POPULATE

Pedon Horizon Ped Void Surface Features

This table records information about clay films, silt coatings, organic stains, slickensides, etc. *(FBDSS and SSM).*

Population standard for all columns in this table: Typically populated, if applicable

1	**Percent**	Definition: *Percent of the total surface area occupied by a ped surface feature over the extent of the horizon. (SSM)*
2	**Kind**	Definition: *A descriptive term or phrase used to express differences between the ped surface and soil matrix.*
3	**Distinctness**	Definition: *The ease and degree of certainty with which a ped surface feature can be identified. (SSM)*
4	**Continuity (Obsolete)**	Definition: *A characterization of the areal extent of the feature.* Population Standard: DO NOT POPULATE

5 **Location**

Definition: *The kind of surface on which coatings are observed.*

Pedon Horizon Ped Void Surface Features Color

1 **Color %**

Definition: *Percent of the soil specimen occupied by a particular color.*

Population Standard: Optional

2 **Hue**

Definition: *A measure of the dominant wavelength of light using Munsell notation system.*

Population Standard: Typically populated

3 **Value**

Definition: *A measure of the lightness of soil color relative to neutral gray using the Munsell notation system.*

Population Standard: Typically populated

4 **Chroma**

Definition: *A measure of the relative strength of a spectral color using the Munsell notation system.*

Population Standard: Typically populated

6 **Moist State**

Definition: *An estimate of the amount of water held within a soil sample in relation to its effect on reflectance of light. Expressed as either moist or dry.*

Population Standard: Typically populated

Pedon Horizon Pores

1 **Quantity**

Definition: *The number of a selected size of pores per unit area of undisturbed soil.*

Population Standard: Typically populated

2 **Quantity Class**

Definition: *The quantity of the pores, expressed as a class.*

Population Standard: Typically populated

3 **Size**

Definition: *The size class of the pores.*

Population Standard: Typically populated

4	**Continuity**	Definition: *Average vertical distance that the minimum diameter of the pore exceeds 0.5 mm when the soil layer is moist or wetter.* Population Standard: Optional
5	**Shape**	Definition: *A description of the multiaxial shape of the pores.* Population Standard: Typically populated

Pedon Horizon Redoximorphic Features

Redoximorphic (redox) features result from the oxidation and/or reduction of Fe and/or Mn, typically due to the presence of water *(FBDSS).*

Population standard for all columns in this table: Typically populated, if applicable

1	**Percent**	Definition: *The percentage of the area covered by the redox feature.*
2	**Size**	Definition: *The size class of the redox feature.*
3	**Contrast**	Definition: *The degree of visual distinction that is evident at the interface between the redox feature and the surrounding soil.*
4	**Hardness**	Definition: *The degree to which a redox feature resists crushing.*
5	**Shape**	Definition: *The shape of the redox feature.*
6	**Kind**	Definition: *The kind of redox feature.*
7	**Location**	Definition: *The location of the redox feature.*
8	**Boundary**	Definition: *The boundary class of the redox feature.*

Pedon Horizon Redoximorphic Features Color

1	**Color %**	Definition: *Percent of the soil specimen occupied by a particular color.* Population Standard: Optional
2	**Hue**	Definition: *A measure of the dominant wavelength of light using Munsell notation system.*

Population Standard: Typically populated

3	**Value**	Definition: *A measure of the lightness of soil color relative to neutral gray using the Munsell notation system.* Population Standard: Typically populated
4	**Chroma**	Definition: *A measure of the relative strength of a spectral color using the Munsell notation system.* Population Standard: Typically populated
6	**Moist State**	Definition: *An estimate of the amount of water held within a soil sample in relation to its effect on reflectance of light. Expressed as either moist or dry.* Population Standard: Typically populated

Pedon Horizon Roots

Population standard for all columns in this table: Typically populated, if applicable

1	**Quantity**	Definition: *The number of the selected size of roots per unit area (SSM).*
2	**Quantity Class**	Definition: *The quantity of roots present, expressed as a class (few, common, or many).*
3	**Size**	Definition: *The size class of the roots.*
4	**Location**	Definition: *The position of the roots in a soil horizon, as described in reference to other features.*

Pedon Horizon Sample

This table is populated only for sampled pedon horizons. The field soil scientist enters the Field Sample ID. The KSSL enters the Lab Sample # on their copy of the sampled pedon. The field soil scientist manually transfers the Lab Sample # to the field copy of the pedon. See **Appendix C: Updating Kellogg Soil Survey Laboratory (KSSL) Characterization Data** for more information.

1	**Lab Sample #**	Definition: *The internal laboratory sample number for the horizon as assigned by the KSSL. It is constructed by using the 2-digit fiscal year * 10000 + consecutive sample number in that year.* Population Standard: Typically populated, if applicable

Population Guidance: When a pedon is submitted to the KSSL for analysis, the KSSL makes a copy of the pedon. This creates two versions of the same pedon, the KSSL version and the original MLRA SSO version. The KSSL will populate this field in their version of the pedon. These unique numbers need to be manually transferred to the MLRA SSO version of the pedon. This ensures that the MLRA SSO version of the pedon is included in the published pedon descriptions.

2	**Field Sample ID**	Definition: *The ID assigned to the soil sample by the person doing the sampling in the field. This value should match the identifying label that is put on the tag of the sample bag at the time of sampling in the field.* ***Population of this field is required for all sampled horizons.***

Population Standard: Typically populated, if applicable

Population Guidance: ID is used to keep the samples organized until the laboratory sample number can be assigned and the horizon in NASIS can be properly associated with the layer stored in the Laboratory Information Management System Database.

Pedon Horizon Soil Structure

Population standard for all columns in this table: Typically populated

1	**Grade**	Definition: *The distinctness of the peds described in terms of ease of separation into discrete units. Massive and single grain are structureless.*
2	**Size**	Definition: *The size class.*
3	**Type**	Definition: *The multiaxial shape of secondary particles, units, or peds.*
4	**Structure ID**	Definition: *An ID assigned to identify a particular row in a table.*
5	**Parts to Structure ID**	Definition: *Used to indicate that the previous record parts to the current record.*

Pedon Horizon Text

Entries in this table are text notes about a specific soil horizon. Older pedon descriptions or OSDs commonly contain narrative descriptive horizon information that cannot be adequately captured with the NASIS Pedon tables and drop-down lists. The Pedon Horizon Text table stores this narrative information.

Population standard for all columns in this table: Optional

1	**Date**	Definition: *The date associated with a particular record, expressed as month, day, year (xx/xx/xxxx).*

2	**Author**	Definition: *The name of the person(s) who entered, or is responsible, for a particular record. Enter complete first and last name; do not use initials.*
3	**Kind**	Definition: *A text entry is identified by kind, category, and subcategory.* Population Guidance*:* Many of the pedon description NASIS reports can display either formatted or unformatted text notes. If the text entry to to be displayed in a pedon description report, choose either horizon note, formatted, or horizon note, unformatted.
4	**Category**	Definition: *User-defined subdivision of the text note kind. Populate as needed.*
5	**Subcategory**	Definition: *User-defined subdivision of the category. Populate as needed.*
6	**Text Entry**	Definition: *The actual narrative portion of a text entry.*

Pedon Horizon VNIR Scan

This table and its child tables were originally created to store information from the Rapid Carbon Assessment study. It can now be used to store other VNIR measurements outside of the Rapid Carbon Assessment initiative.

Population standard for all columns in this table: Optional

1	**Depth to Top** *(cm)*	Definition: *The depth from the soil surface to the top of the layer from which the sample was taken.*
2	**Depth to Bottom** *(cm)*	Definition: *The depth from the soil surface to the bottom of the layer from which the sample was taken.*
3	**Sample Condition**	Definition: *The condition or preparation of the sample.*
4	**Light Source**	Definition: *The source of light used for the VNIR scan of the sample.*
5	**VNIR Scan Date**	Definition: *The date of the VNIR scan.*
6	**VNIR File Name**	Definition: *The file name assigned to the VNIR scan associated with the sample.*

Pedon Horizon VNIR Scan Raw Data

Population standard for all columns in this table: Optional

1	**VNIR Model ID**	Definition: *The identifier of the computer model used to generate the associated soil property value estimate.*
2	**Date**	Definition: *The date the VNIR data file was run through the model to generate the associated soil property value estimate.*
3	**Total Carbon %**	Definition: *The percentage of total carbon in the sample on a gravimetric percentage basis, predicted from VNIR scanning.*
4	**Inorganic Carbon %**	Definition: *The percentage of inorganic carbon in the sample on a gravimetric percentage basis, predicted from VNIR scanning.*
5	**Organic Carbon %**	Definition: *The percentage of organic carbon in the sample on a gravimetric percentage basis, computed from the difference between total carbon percentage and total inorganic carbon percentage.*

Pedon Diagnostic Features

This table is used to identify diagnostic features in the pedon. **Kind, depth, and thickness of diagnostic features must be determined before classifying a pedon.** The entries in this table must be appropriate for the classification assigned *(KST).*

1	**Top Depth** *(cm)*	Definition: *The distance from the top of the soil to the upper boundary of the identified diagnostic horizon or to the upper limit of the occurrence of the diagnostic feature.* Population Standard: Typically populated
2	**Bottom Depth** *(cm)*	Definition: *The distance from the top of the soil to the base of the identified diagnostic horizon or to the lower limit of the occurrence of the diagnostic feature.* Population Standard: Typically populated
3	**Thickness Low** *(cm)*	Definition: *The low range thickness of the diagnostic feature.* Population Standard: Optional
4	**Thickness RV** *(cm)*	Definition: *The relative value thickness of the diagnostic feature.* Population Standard: Typically populated
5	**Thickness High** *(cm)*	Definition: *The high range thickness of the diagnostic feature.* Population Standard: Optional
6	**Kind**	Definition: *The kind of diagnostic feature in the soil.* Population Standard: Typically populated

Pedon Field Measured Property

This table is used to record data that does not have a specific field in any other NASIS table. Enter measured data that apply to the pedon as a whole. Data related to a specific horizon should be entered in the Horizon Field Measured Property table. Data entered in this table is in the database, but it will not print out in the pedon report.

Population standard for all columns in this table: Optional

1	**Name**	Definition: *The name assigned to a user-defined, field-measured property. To be used when the parameter to be recorded does not already exist elsewhere in the database.*
2	**Value**	Definition: *The measured or observed value of the specific user-defined parameter.*
3	**Unit of Measure**	Definition: *The unit of measure associated with a particular field measurement.*

Pedon Hydric Field Indicator

1	**Hydric Field Indicator**	Definition: *The hydric soil indicator used to determine the hydric soil rating. (Field Indicators of Hydric Soils, version 7.0)* Population Standard: Optional

Pedon Infiltration Summary

This table is used to store the results of infiltration studies.

Population standard for all columns in this table: Optional

1	**Test Date**	Definition: *The date the test was conducted.*
2	**Data Collector**	Definition: *The name of the person(s) that collected the measurements. Enter complete first and last name; do not use initials.*
3	**Infiltration Mean** *(cm/hr)*	Definition: *The arithmetic mean of the infiltration rate obtained from the various replications of an infiltration measurement test at a particular location on a particular date.*
4	**Infiltration Std. Dev.**	Definition: *The statistical standard deviation of the calculated mean infiltration rate obtained from the various replications of an infiltration test at a particular location on a particular date.*

5	**Test Method**	Definition: *The method used to measure infiltration rate.*

Pedon Infiltration Constant Head

Population standard for all columns in this table: Optional

1	**Test Date**	Definition: *The date the test was conducted.*
2	**Rep #**	Definition: *The unique number assigned to a particular replicate measurement or test within a study.*
3	**Infiltration Rate** *(cm/hr)*	Definition: *An infiltration measurement associated with each drop in water level (in mariotte reservoir) from a single or double ring run during the time interval recorded.*
4	**Ring Configuration**	Definition: *The configuration of the ring used to measure the infiltration rate in the field.*
5	**Ring Insertion Depth** *(cm)*	Definition: *The depth to which the ring is inserted or driven into the soil.*
6	**Ring Radius** *(cm)*	Definition: *The inside radius of the ring (inner ring if using double ring configuration).*
7	**Water Ponding Depth** *(cm)*	Definition: *Depth from the top of the soil to the top of the water ponded on the soil inside the ring (inner ring if using double ring configuration).*
8	**Mariotte Bottle Radius** *(cm)*	Definition: *The inside radius of the Mariotte bottle or reservoir.*
9	**Notes**	Definition: *Notes describing decisions, issues, or other history related to the record.*

Pedon Infiltration Constant Head Data

Population standard for all columns in this table: Optional

1	**Run #**	Definition: *The number of an individual infiltration run or reading.*
2	**Water Drop** *(cm)*	Definition: *The drop in water level measured during a time interval.*
3	**Delta Time** *(min)*	Definition: *The elapsed time between readings.*
4	**Infiltration Rate** *(cm/hr)*	Definition: *An infiltration measurement associated with each drop in water level (in Mariotte reservoir) using a single- ring or double-ring method during the time interval recorded.*

5	**Steady State ?**	Definition: *An indicator of whether or not a steady state has been achieved. "Yes" indicates that a steady state has been achieved, and "no" indicates that it has not been achieved yet.*

Pedon Infiltration Falling Head

Population standard for all columns in this table: Optional

1	**Test Date**	Definition: *The date the test was conducted.*
2	**Rep #**	Definition: *The unique number assigned to a particular replicate measurement or test within a study.*
3	**Infiltration Rate** *(cm/hr)*	Definition: *An infiltration measurement associated with each drop in water level (in Mariotte reservoir) using a single ring or double ring method during the time interval recorded.*
4	**Ring Configuration**	Definition: *The configuration of the ring used to measure the infiltration rate in the field.*
5	**Ring Insertion Depth** *(cm)*	Definition: *The depth to which the ring is inserted or driven into the soil.*
6	**Ring Radius** *(cm)*	Definition: *The inside radius of the ring (inner ring if using double ring configuration).*
7	**Notes**	Definition: *Notes describing decisions, issues, or other history related to the record.*

Pedon Infiltration Falling Head Data Table

Population standard for all columns in this table: Optional

1	**Run #**	Definition: *The number of an individual infiltration run or reading.*
2	**Delta Time** *(min)*	Definition: *The elapsed time between readings.*
3	**Water Volume** *(ml)*	Definition: *The volume of water added (generally to a depth of 2.54 cm, or 1 inch) to the ring (inner ring if using double ring configuration).*

Pedon Penetration Resistance

This table stores data from penetration resistance measurements.

Population standard for all columns in this table: Optional

1	**Depth** *(cm)*	Definition: *The distance from the soil surface that the penetration resistance measurement was taken.*
2	**Observed Moisture State**	Definition: *The relative moisture state of the soil layer at the time of observation.*
3	**Tip Type**	Definition: *The type of tip used for the measurement.*
4	**Spring Type**	Definition: *The type of spring used for the measurement.*
5	**Penetration Orientation**	Definition: *The orientation used for the measurement.*
6	**Reading 1** *(tons/ft2)*	Definition: *The first penetrometer reading taken at the indicated depth.*
7	**Reading 2** *(tons/ft2)*	Definition: *The second penetrometer reading taken at the indicated depth.*
8	**Reading 3** *(tons/ft2)*	Definition: *The third penetrometer reading taken at the indicated depth.*
9	**Reading 4** *(tons/ft2)*	Definition: *The fourth penetrometer reading taken at the indicated depth.*
10	**Data Collector**	Definition: *The name of the person collecting the measurements or observations.*

Pedon Restrictions

This table is used to record the root-restrictive features observed in the pedon.

1	**Top Depth** *(cm)*	Definition: *The distance from the soil surface to the upper boundary of the restrictive layer.* Population Standard: Typically populated
2	**Bottom Depth** *(cm)*	Definition: *The distance from the soil surface to the lower boundary of the restrictive layer.* Population Standard: Typically populated
3	**Thickness Low** *(cm)*	Definition: *The low end of the range in thickness of the restrictive layer.* Population Standard: Optional
4	**Thickness RV** *(cm)*	Definition: *The relative value of the thickness of the restrictive layer.* Population Standard: Typically populated

5	**Thickness High** *(cm)*	Definition: *The high end of the range in thickness of the restrictive layer.* Population Standard: Optional
6	**Kind**	Definition: *Type of nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly reduce the movement of water and air through the soil or that otherwise provide an unfavorable root environment.* Population Standard: Typically populated
7	**Hardness**	Definition: *The rupture resistance of air-dried and then submerged blocklike specimens of mineral material.* Population Standard: Typically populated

Pedon Soil Stability

Population standard for all columns in this table: Optional

1	**Depth** *(cm)*	Definition *The distance from the soil surface that the soil stability measurement was taken.*
2	**Sample Collector**	Definition *The name of the person(s) that collected the samples. Enter complete first and last name; do not use initials.*
3	**Data Collector**	Definition *The name of the person(s) that collected the measurements. Enter complete first and last name; do not use initials.*
4	**Test Date**	Definition *The date the test was conducted.*
5	**Stability Class Rep 1**	Definition *The first result or replication of the soil stability test at a particular depth.*
6	**Stability Class Rep 2**	Definition *The second result or replication of the soil stability test at a particular depth.*
7	**Stability Class Rep 3**	Definition *The third result or replication of the soil stability test at a particular depth.*
8	**Stability Class Predominant**	Definition *The dominant class reflected in the three replications of the soil stability test.*
9	**Rep 1 Hydrophobic?**	Definition *An indicator as to whether or not the sample on which the first replication of the soil stability test at a particular depth was run is hydrophobic.*
10	**Rep 2 Hydrophobic?**	Definition *An indicator as to whether or not the sample on which the second replication of the soil stability test at a particular depth was run is hydrophobic.*

11 **Rep 3 Hydrophobic?** Definition *An indicator as to whether or not the sample on which the third replication of the soil stability test at a particular depth was run is hydrophobic.*

Pedon Taxonomic History

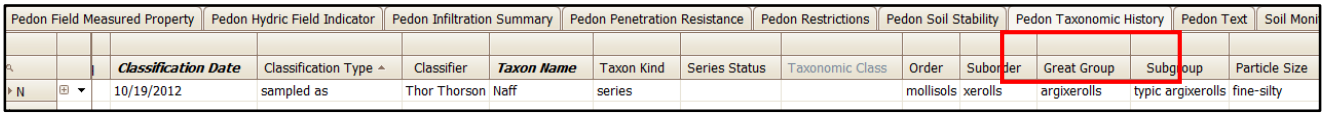
This table is used to populate the classification information for a pedon.

The two options for populating taxonomic class are as follows:

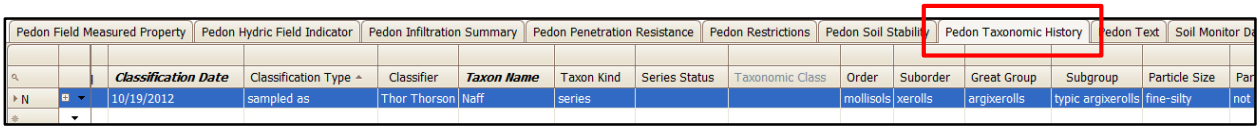
1. Manually enter all of the classification information and then run the Pedon Taxonomic History Classification calculation.
2. Auto-populate using the Series Selection function. This function allows users to input a soil series name and then auto-populate the classification information from the OSD.
    1. The auto-populated information can be modified if the pedon is a taxadjunct to the series.
    2. **BE CAREFUL.** Do not assume that the pedon classifies the same as that of the OSD. **Always classify the pedon before entering it into NASIS.**

1. Manual Population of Taxonomic Class—Step-by-Step Instructions

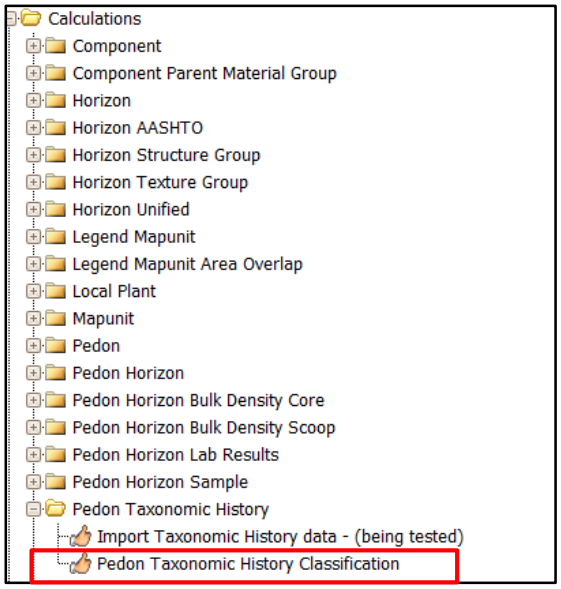
1. Open the Pedon Taxonomic History table > Populate all of the pertinent fields.



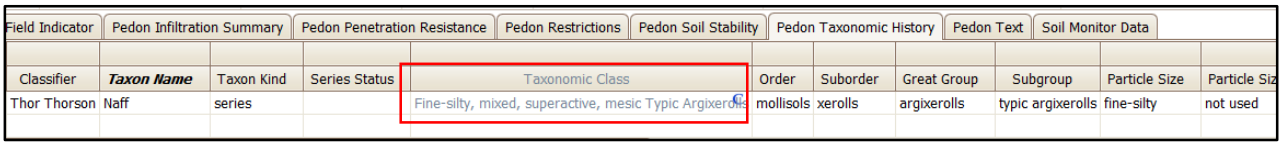
2. Open and populate the following child tables (guidance provided below):
    a. Pedon Taxonomic History Family Minerology table
    b. Pedon Taxonomic History Family Other Criteria table
    c. Pedon Taxonomic History Moisture Class table
3. Highlight the Pedon Taxonomic History records.



4. Open Calculations/Validations > Expand the Calculations folder > Expand the Pedon Taxonomic History folder.

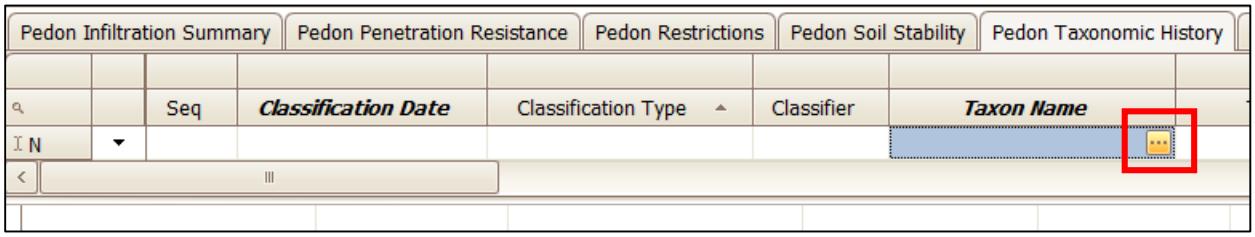


5. Right click on the Pedon Taxonomic History Classification calculation > Click "Run for Highlighted Rows."
    a. The classification will populate in the Taxonomic Class field.
    b. Review the classification in the Taxonomic Class field.

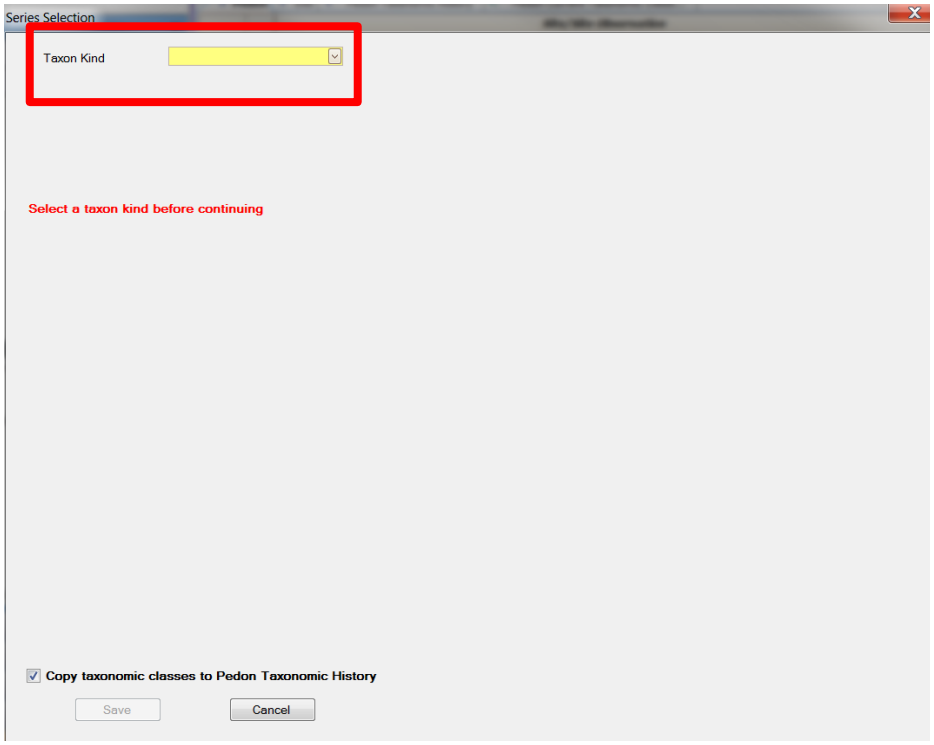


2. Auto-population of Taxonomic Class—Step-by-Step Instructions

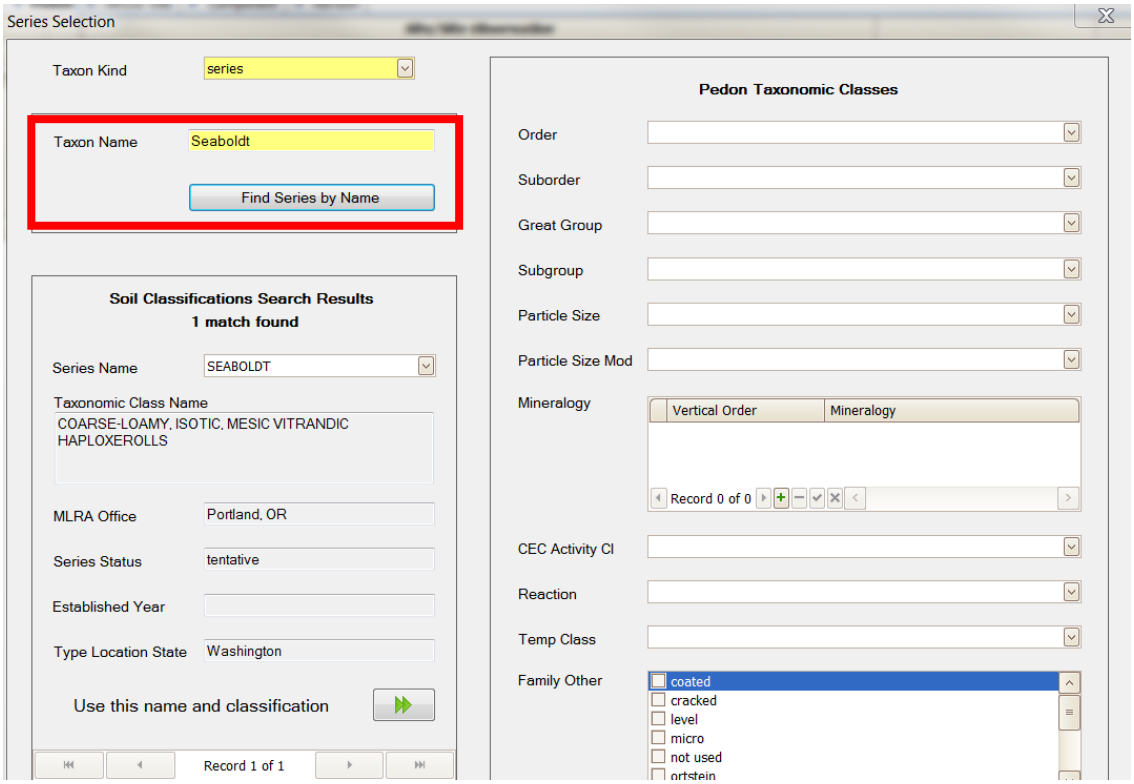
1. Open the Pedon Taxonomic History table > Click the box on the right in the Taxon Name field.



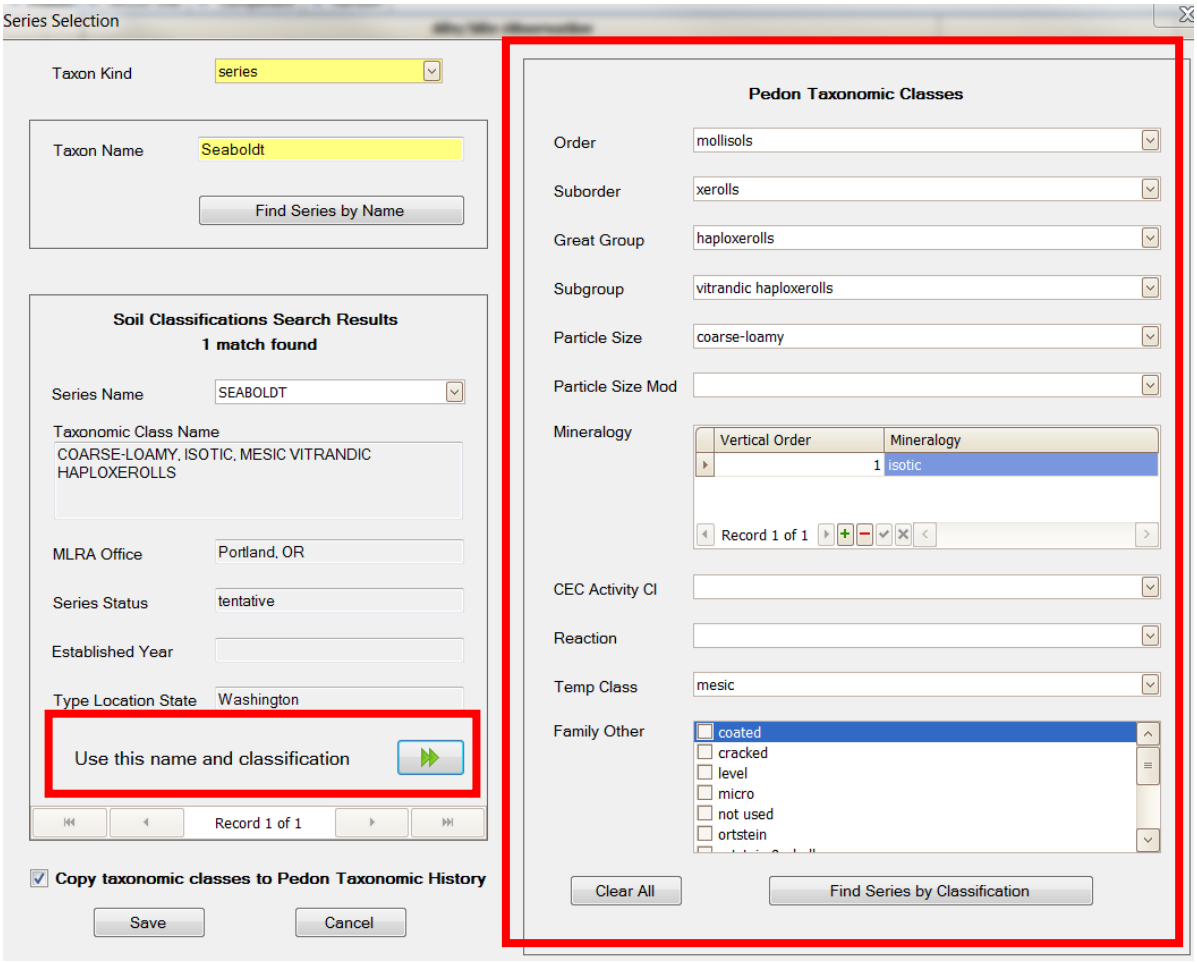
The Series Selection window will open.



2. Choose the taxon kind.
3. Enter a series name in “Taxon Name” > Click “Find Series by Name.”

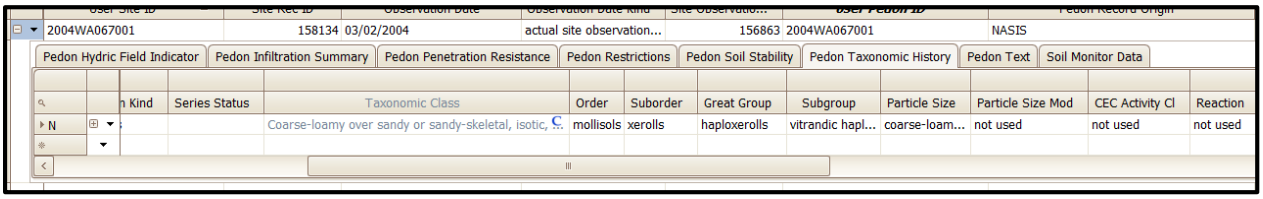


4. If the classification of the series entered is correct, click the green arrow to the right of "Use this name and classification." This will promote the classification on the right side of the screen.



5. Make changes if the pedon has a different classification than the series chosen.
6. Enter "not used" for any classification elements that are not used.
7. Click "Save" at the bottom left.

The classification information is auto-populated.



IMPORTANT NOTE:

If auto-population is used for the classification, the following fields must still be populated manually.

- Classification Type
- Classifier
- Local Phase
- Series Status
- Moist Subclass
- Temp Regime
- Keys to Taxonomy Edition Used
- PCS Top Depth
- PCS Bottom Depth
- OSD Type Location?

1 **Classification Date**

Definition *The date the classification and/or taxon name was assigned.*

Population Standard: Typically populated

2 **Classification Type**

Definition *The location or type of classification and/or taxon name assigned.*

Population Standard: Typically populated

3 **Classifier**

Definition *The name of the person(s) who assigned the classification.*

Population Standard: Typically populated

Population Guidance: Enter complete first and last name; do not use initials.

4 **Taxon Name**

Definition *The name of the taxonomic unit (i.e., the name of the soil).*

Population Standard: Typically populated

Population Guidance: *This field can be used to auto-populate a classification from an OSD. Prior to NASIS 6.2, this information was populated in the Soil Name as Sampled and/or Correlated Soil Name fields.*

5 **Local Phase**

Definition: *Phase criterion to be used to help uniquely identify soil components or pedons. These are terms such as "drained", "eroded", etc.*

Population Standard: Optional

6 **Taxon Kind**

Definition: *Identifies the kind of taxonomic unit described. Examples are series and miscellaneous areas.*

Population Standard: Typically populated

7 **Series Status**

Definition: *The status assigned to the named series in the Soil Classification database.*

Population Standard: Typically populated

8 **Taxonomic Class**

Definition: *A concatenation of the Soil Taxonomy subgroup and family for a soil (long name).*

Population Standard: Typically populated

Calculation: Pedon Taxonomic History Classification

Population Guidance: This field is calculated based on the information in fields 9-17 and the Pedon Taxonomic History Family table and the Pedon Taxonomic History Family Mineralogy, Family Other Criteria, and Moisture Class child tables.

Do not leave fields 9-16 blank**; instead choose "NOT USED"** *(KST).*

9 **Order**

Definition: *The highest level in Soil Taxonomy.*

Population Standard: Typically populated

10 **Suborder**

Definition: *The second level of Soil Taxonomy. The suborder is below the order and above the great group.*

Population Standard: Typically populated

11 **Great Group**

Definition: *The third level of Soil Taxonomy. The category is below the suborder and above the subgroup.*

Population Standard: Typically populated

12 **Subgroup**

Definition: *The fourth level of Soil Taxonomy. The subgroup is below great group and above family.*

Population Standard: Typically populated

13 **Particle Size**

Definition: *Particle-size classes are used as family differentiae. Particle-size refers to grain-size distribution of the whole soil and is not the same as texture. (Soil Taxonomy)*

Population Standard: Typically populated

14 **Particle Size Mod**

Definition: *Taxonomic family criteria that is used to indicate the presence of more than two strongly contrasting classes in the particle-size control section. (Soil Taxonomy)*

Population Standard: Typically populated

15 **CEC Activity Cl**

Definition: *Cation exchange activity classes are used as family criteria differentiae. It is the relative cation-exchange (CEC) activity level of the soil based on the CEC to clay ratio. (Soil Taxonomy)*

Population Standard: Typically populated

16 **Reaction**

Definition: *Indicates the presence or absence of carbonates and the reaction. They are treated together because of their intimate relationship and are used to indicate family differentiae. (Soil Taxonomy)*

Population Standard: Typically populated

Pay careful attention to differences between fields 17-19 and those in the Pedon Taxonomic History Moisture Class table. The Temp Class is different from the Temp Regime, and the Moisture Subclass is different from the Moisture Class. Refer to Keys to Soil Taxonomy, the regional soil survey office, and National technical note 9 – Populating Taxonomic Moisture Class and Subclass for further guidance on correctly populating these fields.

17 **Temp Class**

Definition: *The taxonomic family temperature class used to construct the official classification name. It may be "Not Used" if the taxonomic family temperature class is embedded in the classification name. The actual taxonomic temperature regime is recorded in another place.*

Population Standard: Typically populated

Population Guidance: The taxonomic family temperature class used to construct the official classification name. **Enter "NOT USED" if the taxonomic family temperature class is embedded in the classification name**. The actual taxonomic temperature regime is recorded in field 20.

18 **Moist Subclass**

Definition: *Soil moisture subclasses identify soil moisture regime intergrades or extragrades, except for "typic", and are taxonomic subgroup criteria whether included or not in the name of the subgroup. The definition of each subclass is dependent upon the specific taxonomic great group to which it is attached.*

Population Standard: Typically populated

Population Guidance: Soil moisture subclasses identify soil moisture regime intergrades or extragrades, except for "typic," and are taxonomic subgroup criteria whether included in the name of the subgroup or not. For example, if the soil moisture class is xeric and the soil is NOT extragrading or intergrading into another soil moisture class, enter "typic" as the soil moisture subclass. Refer to National technical note 9 - Populating Taxonomic Moisture Class and Subclass in NASIS for further guidance. **Populating Taxonomic Moisture Class and Subclass in NASIS | NRCS Soils**

19 **Temp Regime**

Definition: *Soil temperature regime as defined in Soil Taxonomy.*

Population Standard: Typically populated

20 **HAMT Material Class**

Definition: *Human-altered and human-transported material classes are used as family differentiae. They are intended to provide useful information on the behavior and interpretations for use of soils that formed in human-altered or human-transported material. (Keys to Soil Taxonomy)*

Population Standard: Typically populated

21 **Keys to Taxonomy Edition Used**

Definition: *The edition of Keys to Soil Taxonomy used to classify the soil.*

Population Standard: Typically populated

22 **PCS Top Depth**

Definition: *Depth to the top of the taxonomic particle size control section. (Soil Taxonomy)*

Population Standard: Typically populated

Population Guidance: **This information must be populated if classifying a pedon. The classification of a pedon cannot be known if the PCS depth is not known.**

23 **PCS Bottom Depth**

Definition: *Depth to the bottom of the taxonomic particle size control section. (Soil Taxonomy)*

Population Standard: Typically populated

Population Guidance: **This information must be populated if classifying a pedon. The classification of a pedon cannot be known if the PCS depth is not known.**

24 **OSD Type Location ?**

Definition: *An indicator of whether or not this pedon record is/was used as the typical pedon for the named series.*

Population Standard: Typically populated

Population Guidance: It is important that this field is correctly applied.

Pedon Taxonomic History Family Mineralogy

1 **Vertical Order**

Definition: *The vertical sequence of the different mineralogies, if there is more than one in a soil profile. If the soil has only one, no entry is needed.*

Population Standard: Typically populated, if applicable

2 **Mineralogy**

Definition: *Enter family mineralogy class. Enter a new row for each class, and assign it a vertical order.*

Population Standard: Typically populated

Pedon Taxonomic History Family Other Criteria

1 **Family Other**

Definition: *Soil characteristics other than the defined family characteristics of particle-size classes, mineralogy classes, cation-exchange activity classes, calcareous and reaction classes, and soil temperature classes.*

Population Standard: Typically populated

Pedon Taxonomic History Moisture Class

1 **Moisture Class**

Definition: *Soil moisture classes are unique to the family classification, though not included specifically in the name, this is a mechanism to provide clear identification of the actual moisture regime.*

Population Standard: Typically populated

Population Guidance: Enter the soil moisture regime class.

Pedon Text

This table is used to store text notes that provide information about the pedon description. Examples are information about genesis, morphology, or classification. This table is different from the Site Text table, which is used to store information about the site on which the pedon occurs.

Population standard for all columns in this table: Optional

1	**Date**	Definition: *The date associated with a particular record, expressed as month, day, year (xx/xx/xxxx).*
2	**Author**	Definition: *The name of the person(s) who entered, or is responsible, for a particular record. Enter complete first and last name; do not use initials.*
3	**Kind**	Definition: *A text entry is identified by kind, category, and subcategory.*
4	**Category**	Definition: *User-defined subdivision of the text note kind. Populate as needed.*
5	**Subcategory**	Definition: *User-defined subdivision of the category. Populate as needed.*
6	**Text Entry**	Definition: *The actual narrative portion of a text entry.*

Soil Monitor Data

This table allows users to store information about precipitation, air temperature, soil moisture, and soil temperature. Populate this table and its two child tables when collecting soil moisture and soil temperature data.

Population standard for all columns in this table: Optional

1	**Station ID**	Definition: *The identifier label of the station or site where the soil moisture and/or temperature monitoring data was collected.*
2	**Observation Date**	Definition: *The date the particular soil was described or sampled, expressed as month, day, year (xx/xx/xxxx).*
3	**Daily Precipitation** *(cm)*	Definition: *The precipitation received at the site on a particular day.*
4	**Min Air Temp** *(°C)*	Definition: *The minimum air temperature for the day, from temperature sensor.*
5	**Ave Air Temp** *(°C)*	Definition: *The average air temperature for the day, from temperature sensor.*
6	**Max Air Temp** *(°C)*	Definition: *The maximum air temperature for the day, from temperature sensor.*
7	**Temp Sensor Height** *(°C)*	Definition: *The height above the ground surface that the temperature sensor was placed.*

8	**Notes**	Definition: *Notes describing decisions, issues, or other history related to the record.*

Soil Moisture Monitor Data

Population standard for all columns in this table: Optional

1	**Sensor ID**	Definition: *The identifier number of the particular sensor in a set.*
2	**Sensor Depth** *(cm)*	Definition: *The depth from the soil surface to the soil moisture sensor.*
3	**Sensor Kind**	Definition: *The kind of soil moisture sensor installed.*
4	**Min Soil Moisture - Vol** *(%)*	Definition: *The minimum percent soil moisture by volume at the specified depth for the day.*
5	**Ave Soil Moisture - Vol** *(%)*	Definition: *The average percent soil moisture by volume at the specified depth for the day.*
6	**Max Soil Moisture - Max** *(%)*	Definition: *The maximum percent soil moisture by volume at the specified depth for the day.*
7	**Notes**	Definition: *Notes describing decisions, issues, or other history related to the record.*

Soil Temperature Monitor Data Table

Population standard for all columns in this table: Optional

1	**Sensor ID**	Definition: *The identifier number of the particular sensor in a set.*
2	**Sensor Depth** *(cm)*	Definition: *The depth from the soil surface to the soil temperature sensor.*
3	**Sensor Kind**	Definition: *The kind of soil temperature sensor installed.*
4	**Min Soil Temp** *(°C)*	Definition: *The minimum soil temperature value at the specified depth for the day.*
5	**Ave Soil Temp** *(°C)*	Definition: *The average soil temperature value at the specified depth for the day.*
6	**Max Soil Temp**	Definition: *The maximum soil temperature value at the specified depth for the day.*

(°C)

7 **Notes** Definition: *Notes describing decisions, issues, or other history related to the record.*

Site Association

Thhis table is used to group site records to efficiently query them (and any linked pedons). Typically, multiple sites are observed and multiple pedons are described for a project or traditional soil survey. It commonly is desirable to group sites and pedons in NASIS so that they can easily be loaded into a local database and/or a selected set. The Site Association table provides a simple way to group sites and pedons. Examples for uses of grouped sites and pedons include:

- Special studies
- SDJR projects
- MLRA projects
- Initial soil surveys

Types of associations can be created as needed by the user. A site association may contain any number of sites, and sites can be part of more than one site association.

1 **User Site Association ID**

Definition: *A short label to help a user identify a particular site association.*

Population Standard: Required, if creating a Site Association

Population Guidance: There is currently no national standard for this field.

Site Association Site

This table stores all sites that are linked to a site association. To populate, first create a site and then choose the site(s) from the drop-down menu. Create a new record for each site linked to the site association.

Alternatively, multiple sites can be pasted into this table at once. Step-by-step instructions are below.

Choices in the two columns below are from the Site table. Use the Associated Site User Site ID to locate the site and the other field will auto-populate. The site must be loaded into the local database for it to be available as a choice.

1 **Associated Site User Site ID**

Definition: *A short label to help a user identify a particular site.*

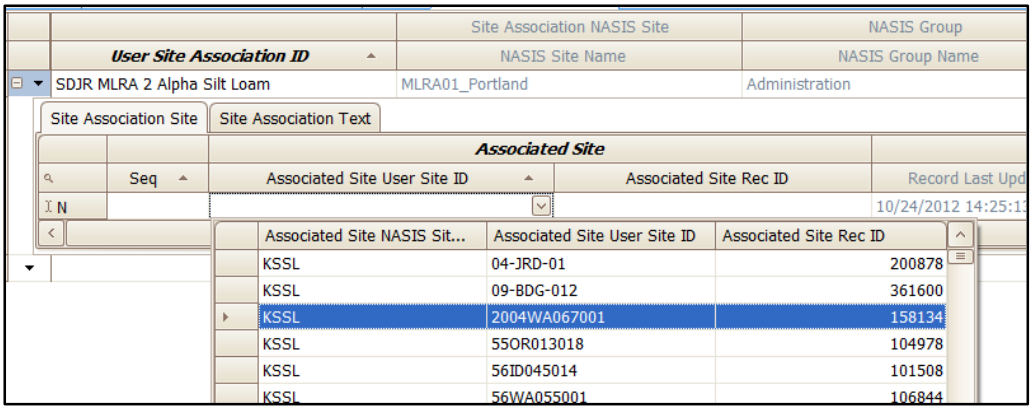
Population Standard: Required, if creating a Site Association

Population Guidance: Use this field to link a site record to a site association ID. Begin typing the User Site ID into the field and a choice list will appear (see screenshot below). The site must be in the local database for it to be available as a choice.

2 **Associated Site Rec ID** Definition: *An internal ID (integer) that is part (or all) of a key that uniquely identifies the site record. This value is managed by NASIS and cannot be edited.*

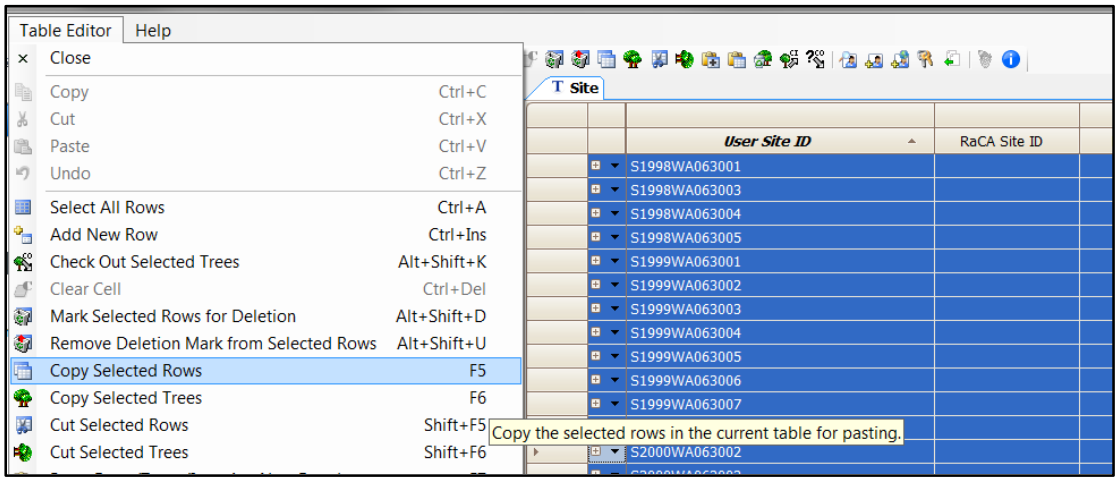
Population Standard: Required, if creating a Site Association

Population Guidance: Auto-populates based on the User Site ID that is chosen.

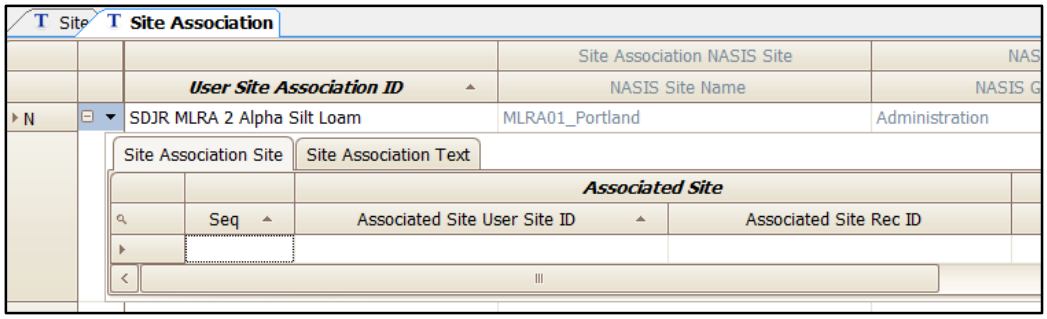


How to paste multiple sites into the Site Association Site table at one time.

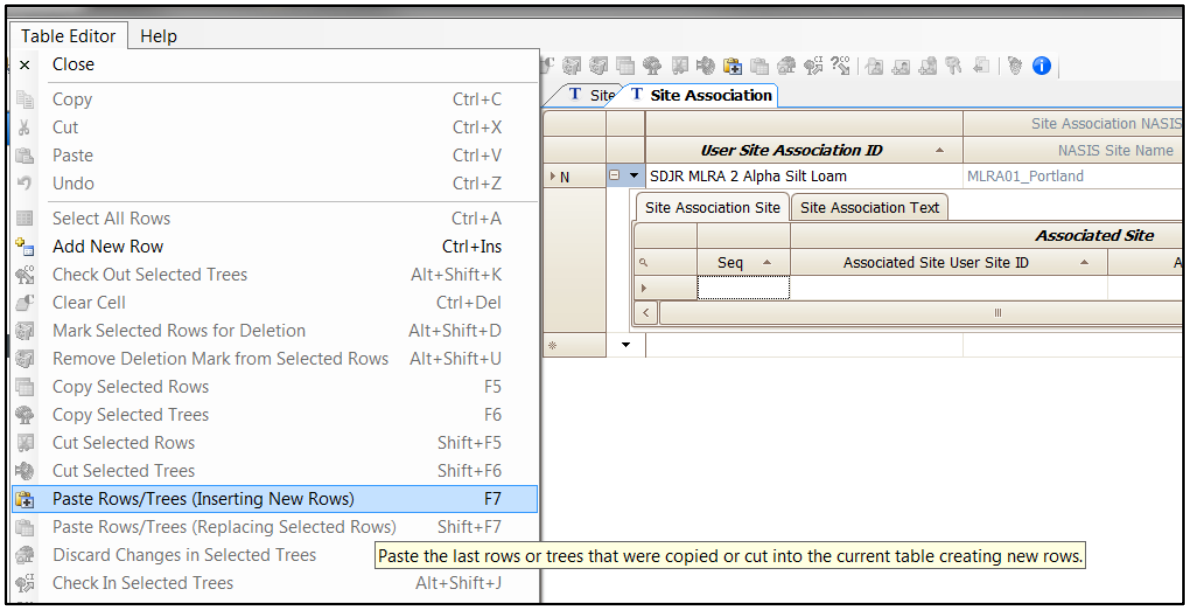
1. Clear selected set.
2. Load all sites into the selected set. That is, load all sites to be included in the site association.
3. Open the Site table.
4. Select All Records > Copy Selected Rows.



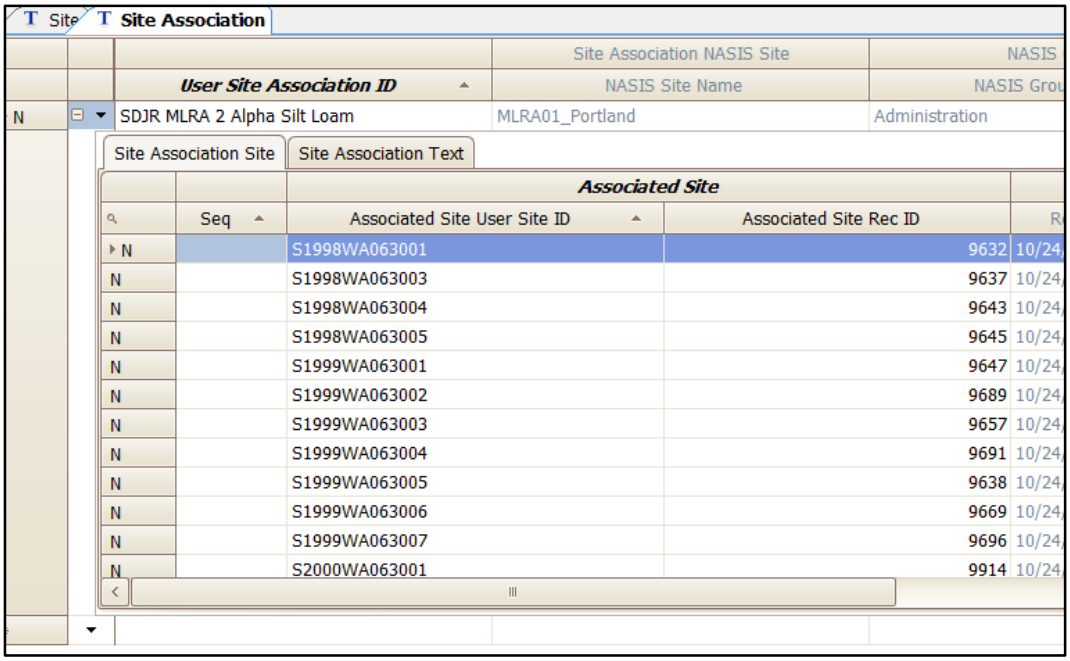
5. Load existing site association into the selected set or create new site association record.
6. Open Site Association table > Open Site Association Site child table.



7. Click in the Site Association Site table > Paste Rows/Trees (Inserting New Rows)



User Site IDs and Site Rec IDs from the Site table will now show up in the Site Association Site table.



8. Upload changes to the National database.

Site Association Text

This table is used to store text notes that help to explain the purpose for the site association. The notes may be grouped, or categorized, by populating the kind, category, and subcategory fields as needed.

Population standard for all columns in this table: Optional

1	**Date**	Definition: *The date associated with a particular record, expressed as month, day, year (xx/xx/xxxx).*
2	**Author**	Definition: *The name of the person(s) who entered, or is responsible, for a particular record. Enter complete first and last name; do not use initials.*
3	**Kind**	Definition: *A text entry is identified by kind, category, and subcategory.*
4	**Category**	Definition: *User-defined subdivision of the text note kind. Populate as needed.*
5	**Subcategory**	Definition: *User-defined subdivision of the category. Populate as needed.*
6	**Text Entry**	Definition: *The actual narrative portion of a text entry.*

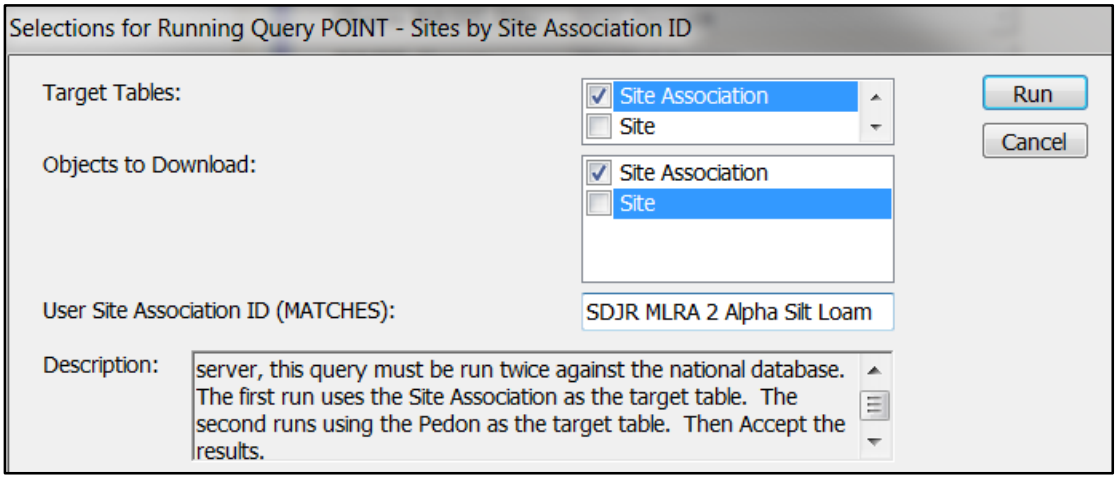
Example of How to Use the Site Association

This section explains how to query for a site association and load all sites and pedons tied to a site association into your selected set.

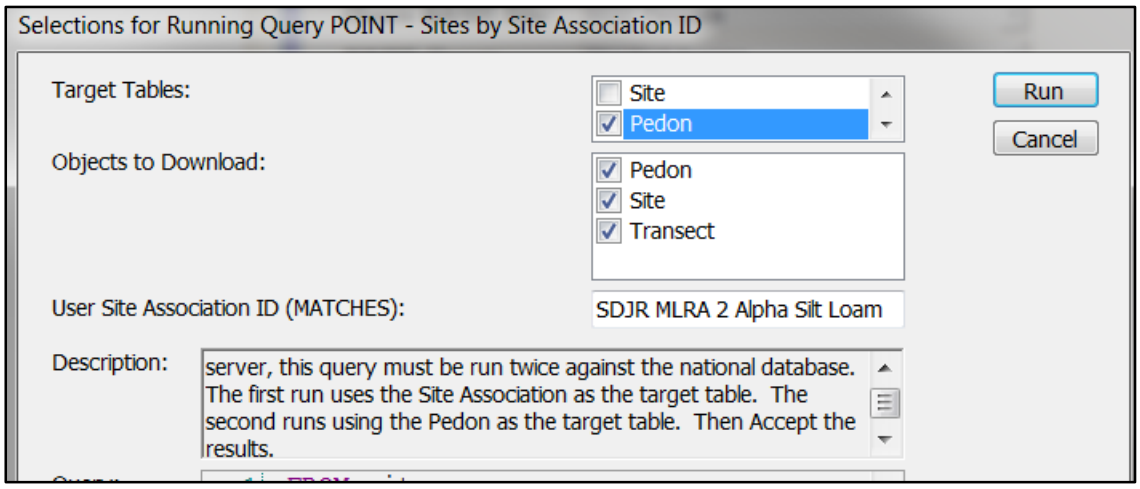
1. Start with an empty selected set.

2. In the Queries Explorer, choose the NSSC Pangaea query "Pedon – Sites by Site Association ID." Enter the User Site Association ID, and run it against the National database.
   IMPORTANT: Follow the instructions in the Description box, as this query must be run twice against the National database in order to load the site association, site, and pedons.

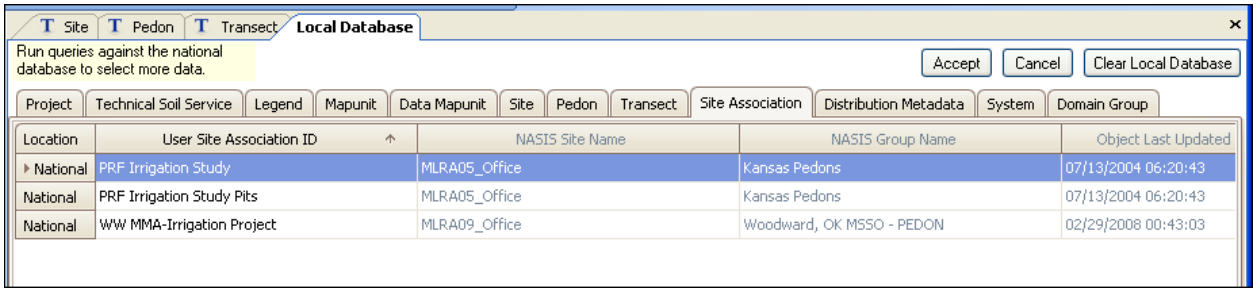
First time running query against the National database:



Second time running query against the National database:

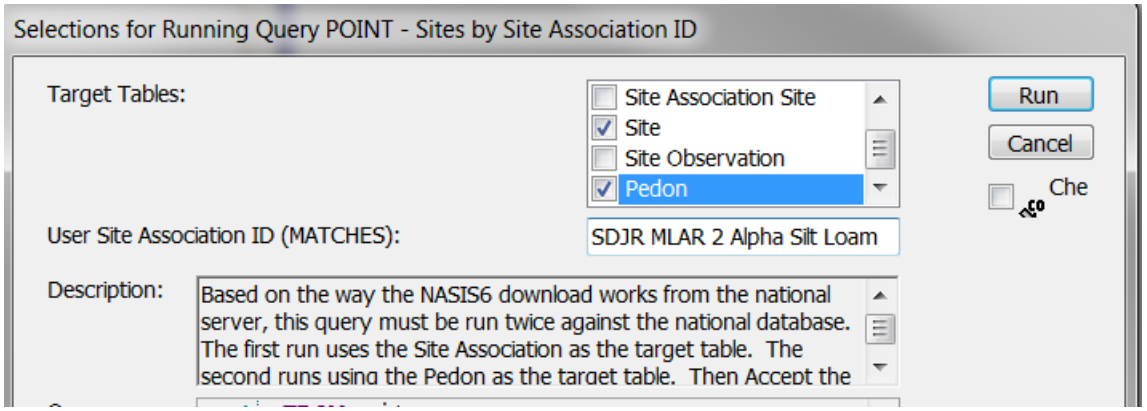


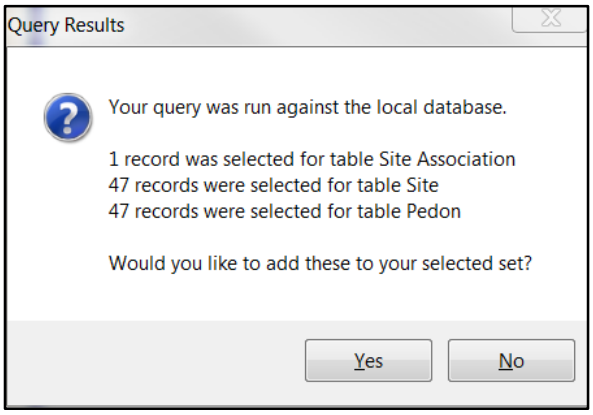
3. The local database setup appears each time after running the query.



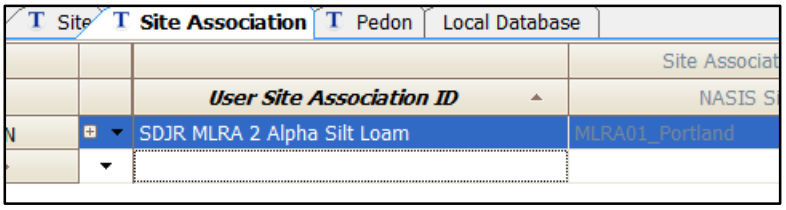
4. Choose "Accept" to download the results to the local database.

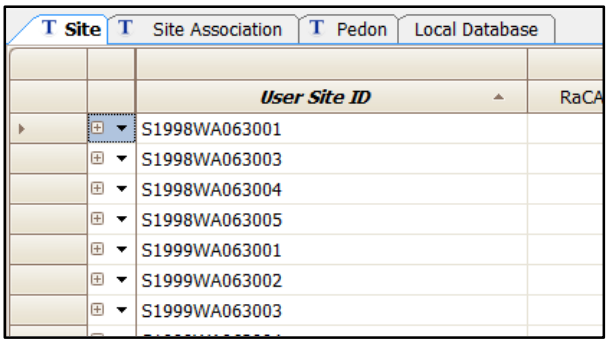
5. Run the query again, but this time run it against the local database to load the results into the selected set. Enter the User Site Association ID.

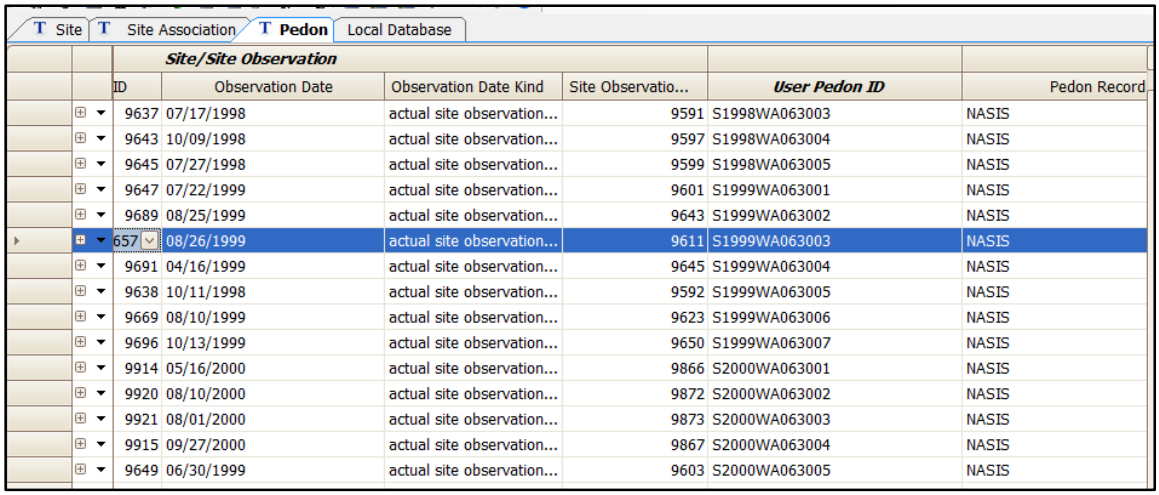




6. From the Table Explorer Panel, open the Site Association table, Site table, and Pedon table. All three tables should now contain data. See the screenshots below.







Transect

Transects are special kinds of groupings, and information related to them is recorded in the Transect table. This table is used to record general information about the transect being described. Data collected at the individual stops on each transect are recorded in the Pedon, Site, and Site Observation tables.

A transect is a series of samplings (in this case, pedons) taken across a landscape in order to gather data for a stated purpose, such as map unit content or diversity. Other types of data collected along transects may also be recorded, such as depth to a particular soil property or feature.

1 **User Transect ID**

Definition: *An identifier assigned by the user to a particular transect.*

Population Standard: Required

Population Guidance: A National standard has not been developed for this field.

2 **Transect Author**

Definition: *Names of the soil scientist(s) that ran the transect.*

Population Standard: Typically populated

Population Guidance: Enter complete first and last names.

3 **Transect Kind**

Definition: *The kind of transect (geometrically described). Described as one of the following: Straight, zigzag, or random point. If straight or zigzag then the actual interval since the last observation point is a required entry. This is a required entry for a transect.*

Population Standard: Required

4 **Transect Selection Method**

Definition: *Describes how the transect location was selected. Described as being one of the following. Randomly selected or selected based on some bias. This is a required entry field for transect data.*

Population Standard: Required

5 **Transect Delineation Size**

(acres)

Definition: *Approximate size of the map unit delineation in which the transect was run.*

Population Standard: Optional

6 **Transect Direction**

(degrees)

Definition: *Direction of transect as measured in degrees of aspect from the first observation point on the transect. This is a required entry field for transects.*

Population Standard: Required

7 **Certification Status**

Definition: *An indicator of the level of review and certification for use that the transect data has received.*

Population Standard: Optional

Transect Estimated Composition

1 **Component Name**

Definition: *Name assigned to a component based on its range of properties.*

Population Standard: Typically populated

2 **Local Phase**

Definition: *Phase criterion to be used to help uniquely identify soil components. These are terms such as "drained," "eroded," etc.*

Population Standard: Optional

3 **Comp %**

Definition: *The percentage the component makes up of the map unit.*

Population Standard: Optional

4 **Slope Gradient**

Definition: *The difference in elevation between two points, expressed as a percentage of the distance between those points (SSM).*

Population Standard: Optional

Transect Text

This table is used to store text notes that may help to explain the purpose of the transect. Actual notes collected during the transect should be entered either in the Pedon Text or Site Observation Text table as appropriate. The notes may be grouped, or categorized, by populating the kind, category, and subcategory fields as needed.

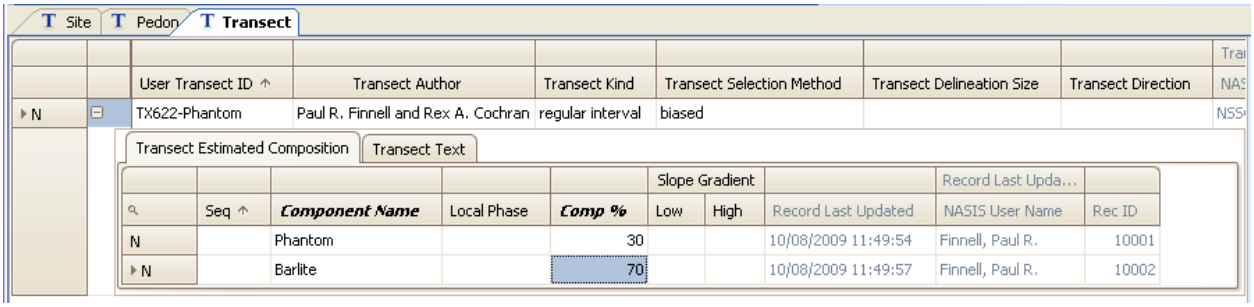
Population standard for all columns in this table: Optional

1	**Date**	Definition: *The date associated with a particular record, expressed as month, day, year (xx/xx/xxxx).*
2	**Author**	Definition: *The name of the person(s) who entered, or is responsible, for a particular record. Enter complete first and last name; do not use initials.*
3	**Kind**	Definition: *A text entry is identified by kind, category, and subcategory.*
4	**Category**	Definition: *User-defined subdivision of the text note kind. Populate as needed.*
5	**Subcategory**	Definition: *User-defined subdivision of the category. Populate as needed.*
6	**Text Entry**	Definition: *The actual narrative portion of a text entry.*

Examining the Transect Tables

The Transect table is used to capture and manage the transect information (kind, selection method, delineation size, and direction). The Transect Text table allows entry of related notes. Transects are created in the Transect Object table, but the individual transect stops are recorded in the Pedon table. Enter the information in the Transect table, then populate the Pedon table. Enter the stop number and the interval in the Pedon table.

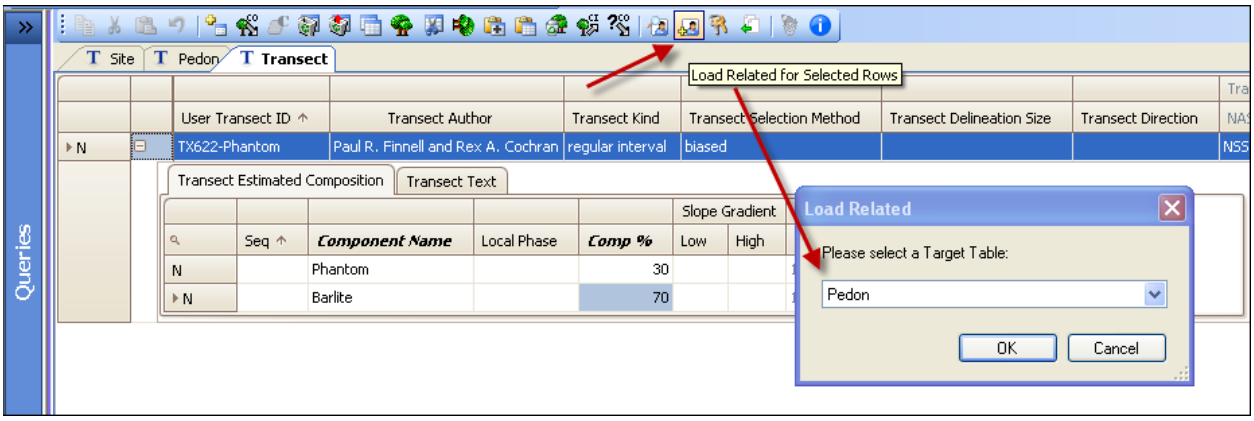
1. Open the Transect table to view the table and its child tables. Notice the Transect Estimated Composition and Transect Text child tables.



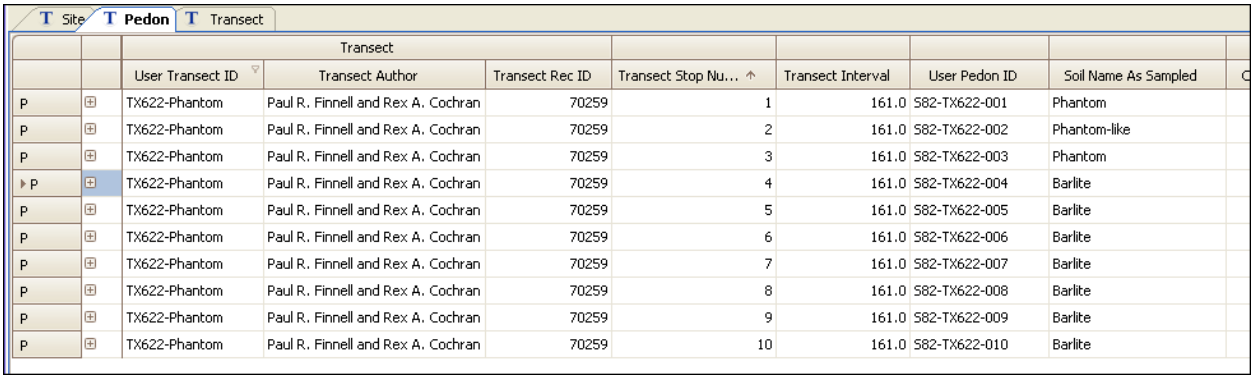
2. Use the "View Information" menu option or toolbar button to examine the information in each table or column.

The "Load Related for Selected Rows" function can be used to load the pedons from the local database into the selected set for those pedons linked to a specific transect. If the pedons are in the selected set, then the "Find Related for Selected Rows" function can be used to find the specific pedons in the Pedon table.

3. Highlight a transect record in the Transect table and choose either function. Choose the Pedon table from the "Load Related" choice list. (NASIS User Guide Chapter 9: Examining the Point Data Objects (Version 6.1, November 2011) 9-14)



4. Return to the Pedon table.

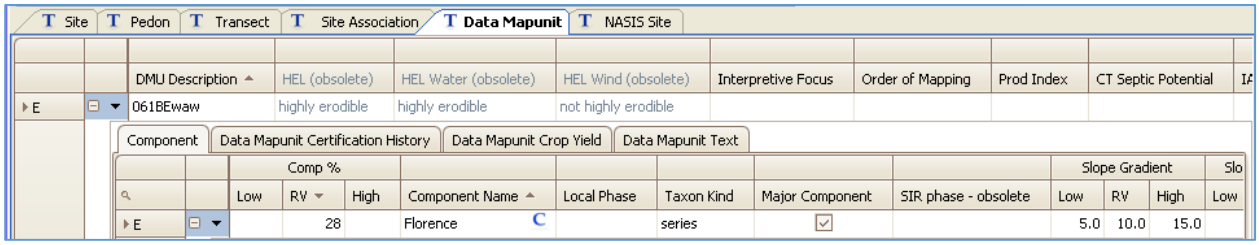


NOTE: This view of the Pedon table has been modified. The Transect band was moved to the left side of the table. The Transect band includes the three columns from the Transect table identifying the "User Transect ID," "Transect Author," and "Transect Rec ID." In addition, the "Transect Stop Number" and the "Transect Interval" in the table were moved to associate them with the soil name.

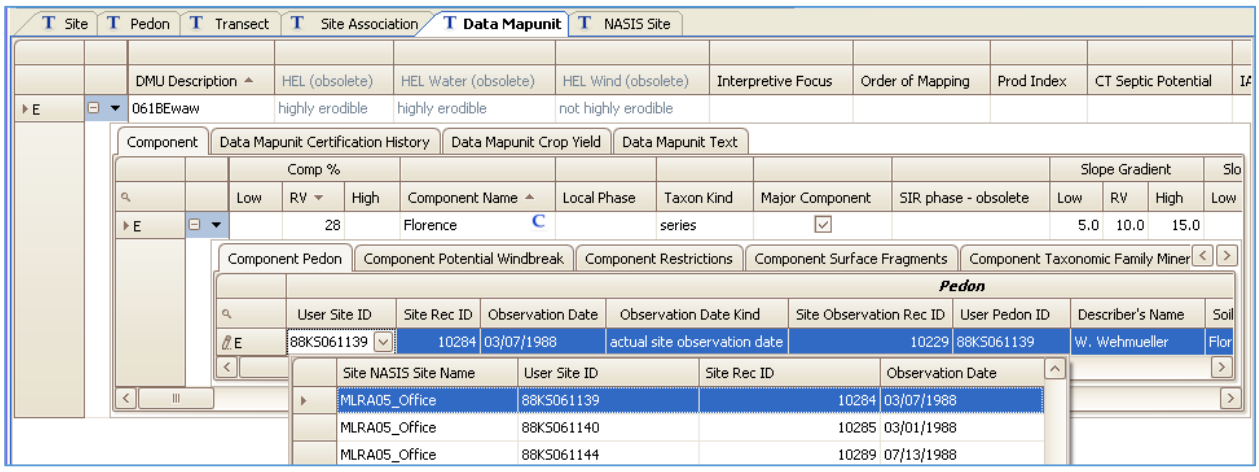
Appendix A: Examining the Link between Pedons and Components

Pedons are linked to a component. The component should be in the Data Mapunit from which the pedon was described. The following steps require the linked component to be in the local database. The pedon is linked to a component through the Component Pedon table.

1. Load the component into the selected set.



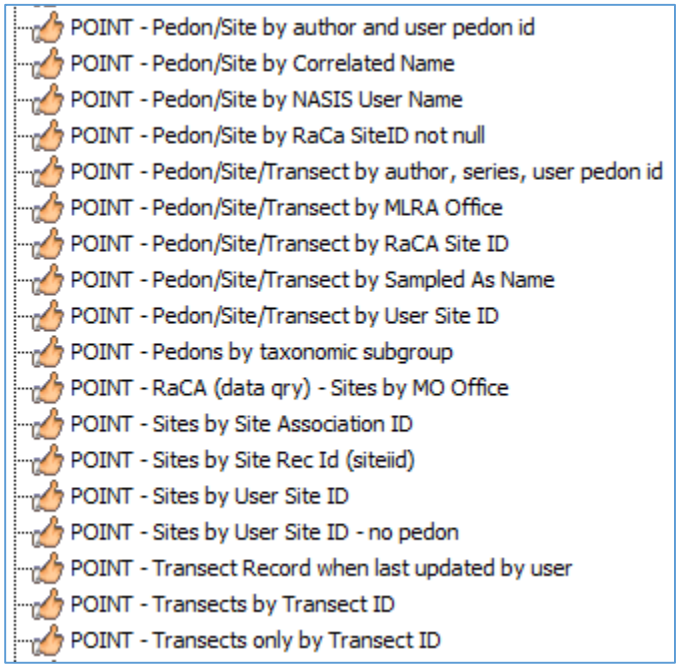
2. Verify that the Data Mapunit is checked out and open the Component Pedon child table.



3. Use the choice list to select the appropriate pedon(s) to be linked to the component. This choice list is controlled by the pedons stored in the local database. After selecting the pedons, identify the one pedon that is “representative” for the taxonomic unit description. All other pedons are documentation for support of the component ranges.

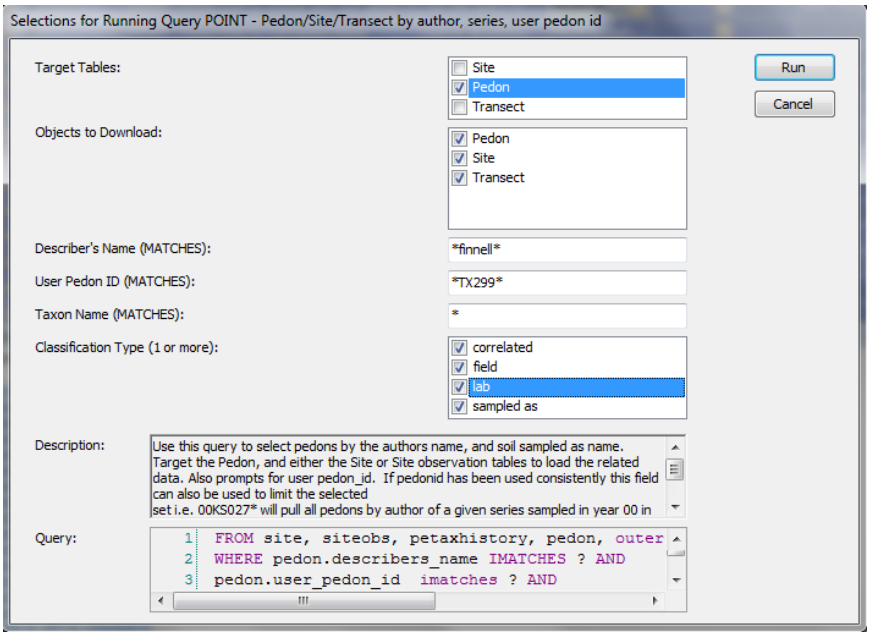
Appendix B: Querying for Point data

Point data includes the Site, Pedon, Transect, and Site Association objects. Numerous queries have been written as examples to load entered data. The NSSC Pangaea site contains the following queries:



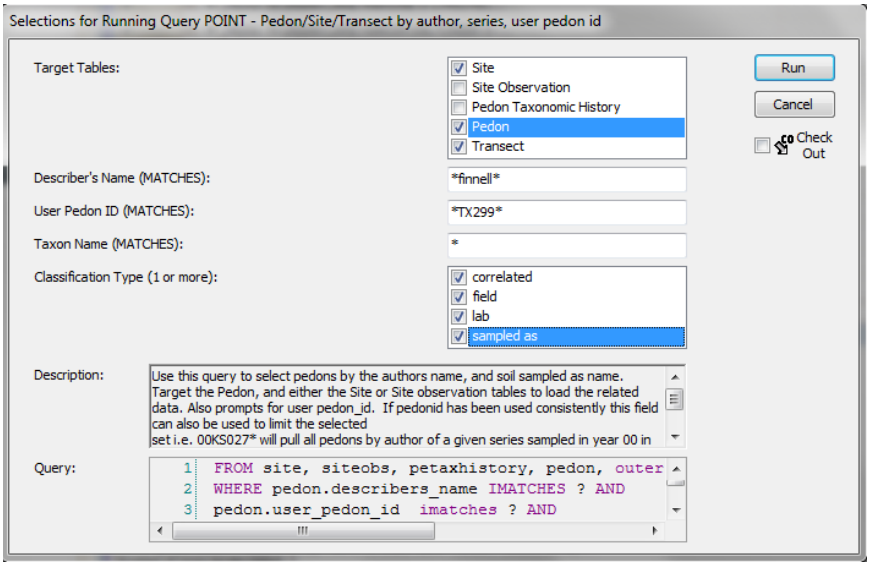
The two most useful are:
"POINT – Pedon/Site by author and user pedon id"
"POINT – Pedon/Site/Transect by author, series, user pedon id"

Queries are run twice; one against the National database and then a second against the local database.



Setting "Pedon" as the Target Table sets the default "Objects to Download" to Pedon, Site, and Transect. The query prompts for the Describers Name (the reason consistency is important in this field), User Pedon ID (following National standard allows all users to query for year, state, or county), and the Taxon Name designating the Classification Type.

When run against the local database, the same parameters can be set to build the selected set with the specific set of data.



Appendix C: Updating Kellogg Soil Survey Laboratory (KSSL) Characterization Data

A new method for managing and updating KSSL pedon data is in effect. The historical SOI-8 method is no longer used to update the pedon descriptions. Historically, there has been the original site and pedon owned by KSSL and a duplicate owned by the MLRA regional office. The new process uses one site and links the two pedons.

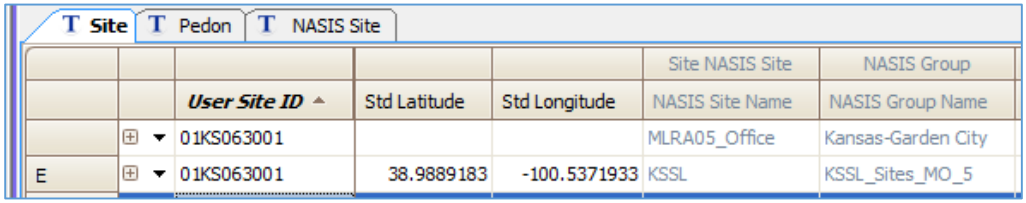
The official site record will be owned by the KSSL NASIS Site and the appropriate "KSSL_Sites_MO_x" Group. Membership of these groups will include KSSL staff and MLRA regional office staff.

Both pedons will be linked to the official KSSL site; however:

1. The original pedon description, entered at the time of sampling, will be owned by the KSSL site.
2. The "correlated" pedon description will be owned by the MLRAxx_Office site.

This allows the MLRA regional office to maintain and update the official site and the "correlated" pedon record while preserving the original (KSSL) field description.

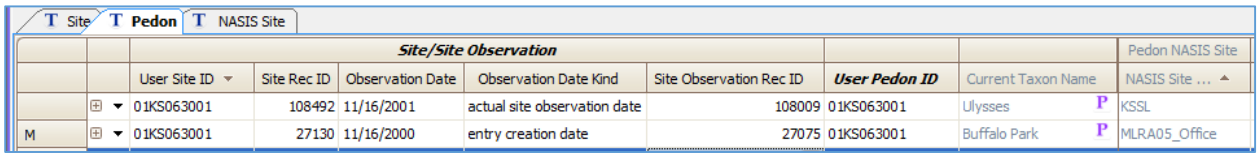
For example, compare the following two sets of sites and pedons from a soil sampling.



Site | Pedon | NASIS Site

					Site NASIS Site	NASIS Group
		User Site ID	Std Latitude	Std Longitude	NASIS Site Name	NASIS Group Name
		01KS063001			MLRA05_Office	Kansas-Garden City
E		01KS063001	38.9889183	-100.5371933	KSSL	KSSL_Sites_MO_5

The original is owned by the KSSL, and a copy is owned by the MLRA05_Office.

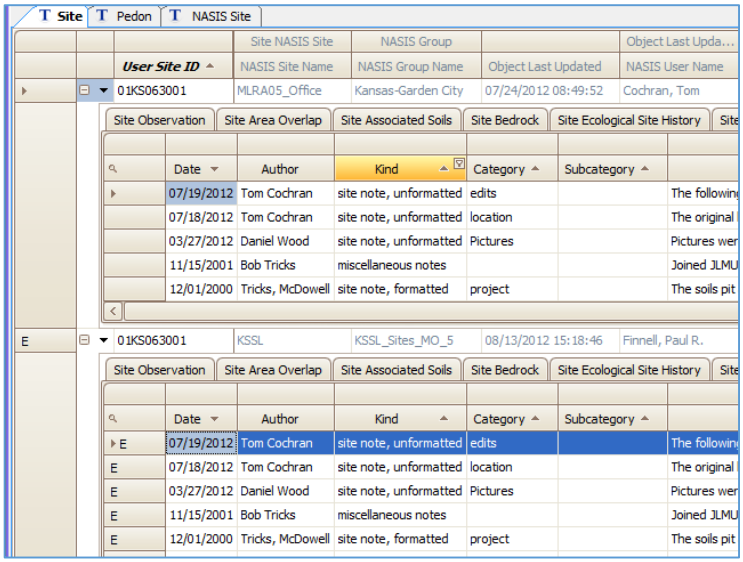


Site | Pedon | NASIS Site

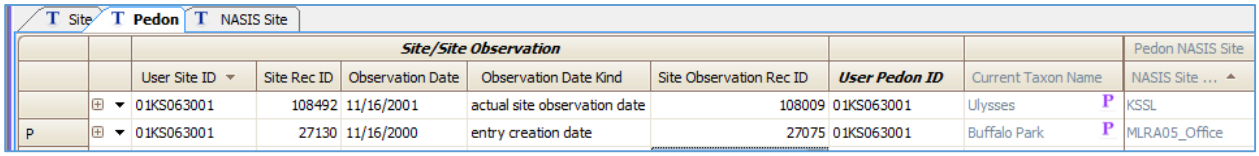
		Site/Site Observation							Pedon NASIS Site
		User Site ID	Site Rec ID	Observation Date	Observation Date Kind	Site Observation Rec ID	User Pedon ID	Current Taxon Name	NASIS Site ...
		01KS063001	108492	11/16/2001	actual site observation date	108009	01KS063001	Ulysses P	KSSL
M		01KS063001	27130	11/16/2000	entry creation date	27075	01KS063001	Buffalo Park P	MLRA05_Office

There is a duplicate set of data for this sampled site. The MLRA05_Office pedon has been updated to a new series name and taxonomy, and several other updates have been made to the site and pedon records. With this new method, there will be one official site record (KSSL) and two pedon records (KSSL and MLRAxx_Office). The site record will be owned by the KSSL Site and the "KSSL_Sites_MO_xx" NASIS Group. No changes will be made to the pedon ownerships.

The Site Object tables will be consolidated into one record. Once consolidated, the unnecessary Site record can be removed. This will require a review of all the Site Object tables to verify all data has been captured. The site is then transferred to the "KSSL_Sites_MO_x" NASIS Group.

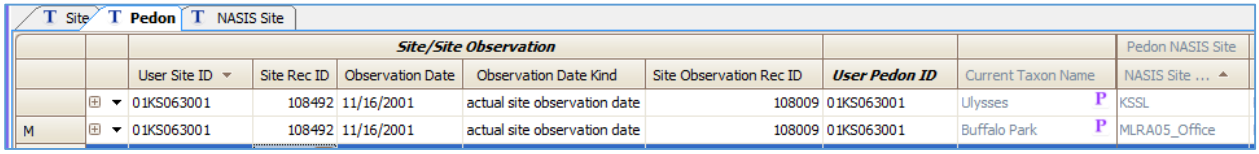


The two sites have different Site Observation Record IDs:



The MLRAxx_Office pedon will be modified and linked to the site owned by the KSSL and "KSSL_Sites_MO_5" Group. In the image above, the pedons are linked to each individual site—one to the KSSL site and the other to the MLRA05_Office. The "Buffalo Park" pedon is linked to Site Observation 27075 (MLRA) and the "Ulysses" pedon is linked to Site Observation 108009 (KSSL).

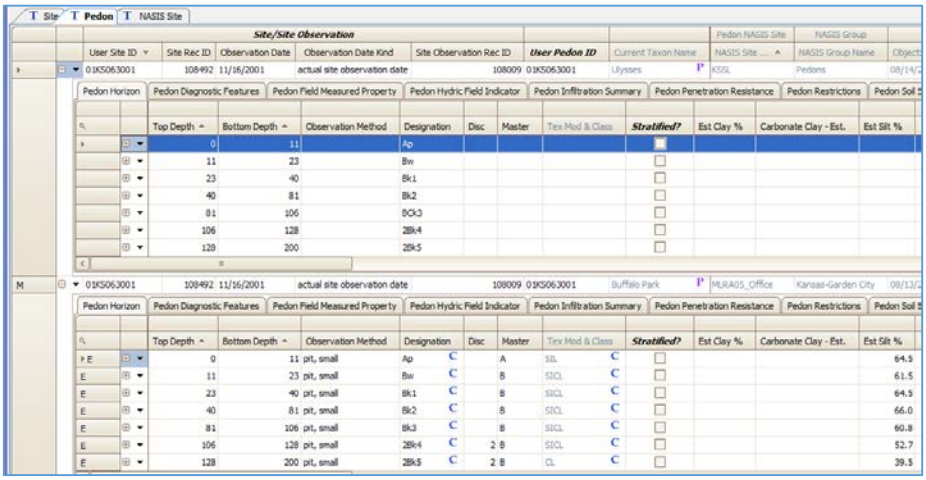
Both pedons will be linked to Site Observation 108009, as noted in the image below.



Now, both pedons are linked to one site and one site observation. Before the MLRAxx_Office site pedon is deleted, it should be compared to that of the KSSL site and any child table information should be updated in the KSSL Site table. The extra site record can be deleted after verification that all data has been compiled into the official site record. This will allow the MLRA regional office staff to maintain the site information formerly found on the SOI-8 form. It will allow the MLRA staff to maintain a pedon that can be updated with any changes in series name or taxonomy.

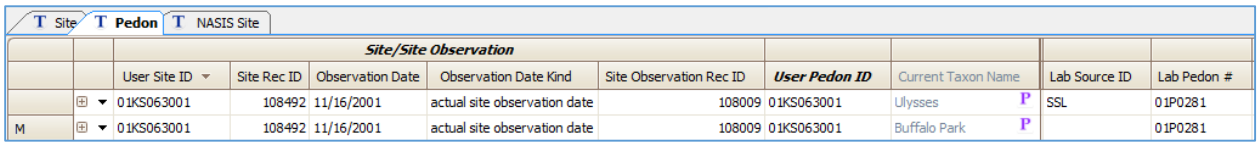
If there has been extensive updating of the MLRAxx_Office site and it is better to make this the official site, then contact the lab liaison. The lab liaison will have to work with the KSSL database administrator to make the changes. This will delay the process.

This process involving one site and two pedons will replace the SOI-8 process. It will allow the MLRA regional office staff to provide quality assurance and maintain the correlation history of the sampled pedons. The staff will have the ability to maintain the site information and the pedon information.

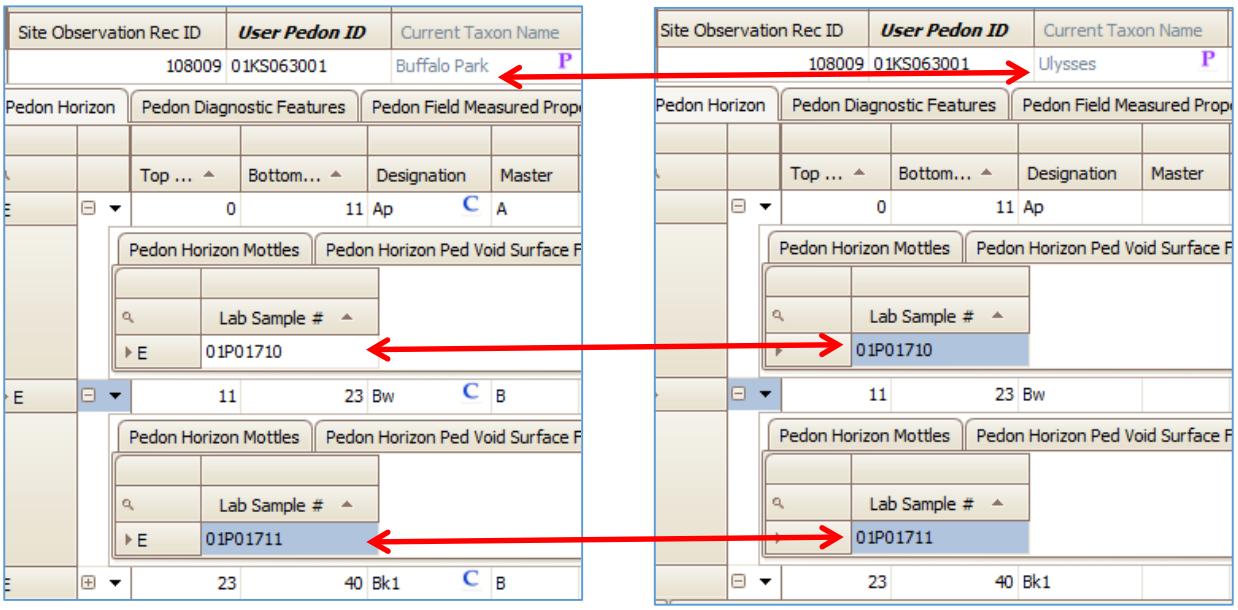


This process will also allow the most current pedon description to be published with the lab data via the KSSL website. Before the MLRAxx_Office pedon can be published, two sets of data will need to be populated.

1. The Lab Source ID and Lab Pedon # for the KSSL and MLRAxx_Office pedons must match.



2. The Lab Sample # in the new NASIS 6.2 Pedon Horizon Sample table.



3. Populate the Lab Certified Description to identify the pedon used for the publication description.
4. The KSSL website will use the MLRAxx_Office pedon as the official record for the lab data reports when the Lab Source ID, Lab Pedon #, and Pedon Horizon Sample table are populated in the MLRAxx_Office pedon.

For more information, refer to the *Soil Survey Laboratory Information Manual*.

Appendix D: Populating Coordinate Pairs in the NASIS Site Table

Software referred to in Appendix D:

- Windows 7
- NASIS 6.2
- ArcGIS 10.0
- DNR GPS 6.0

Appendix D provides detailed guidance in the following:

a. How to correctly populate coordinate pairs and their associated fields in the NASIS Site table.

b. How to use ArcMap to calculate latitude/longitude in decimal degrees, using WGS 84 datum, for a feature class or shapefile.

c. How to use the Import GPS Site Data function in NASIS 6.2, including guidance on how to create .gpx files.

Notes:

- Guidance in this appendix includes detailed step-by-step instructions and numerous screenshots. Discrepancies will occur if using software other than those referred to in this appendix.

1. Populating Coordinates and Associated Fields in the Site Table

NASIS allows coordinate pairs to be entered in the following formats:

- Standard latitude/longitude in decimal degrees
- Latitude/longitude in degrees, minutes, seconds
- UTMs

This section discusses each set of coordinate pairs and their associated fields.

Standard Latitude and Longitude in Decimal Degrees

Site Table Fields Covered in This Section:

a. Std Latitude and Std Longitude
b. Coordinate Source
c. GPS – Positional Error
d. GPS – PDOP

Std. Latitude/Std. Longitude

Std Latitude	Std Longitude
44.0242805	-120.4835968
44.0512276	-120.2910919
44.0326157	-120.2385941

- The purpose of these fields is to ensure a national datum and format standard for all sites entered into NASIS.
    - Historically, coordinates were entered into NASIS in variable datums and variable coordinate pair types, which made the display of site locations difficult.
    - These new fields provide datum and format consistency, which allows for easy display of site locations in ArcGIS.

- ***IMPORTANT: Std. latitude and std. longitude must be in decimal degrees projected using the WGS 84 datum.***
    - ***Do not populate these fields with coordinates projected using a datum other than WGS 84.***

- In the United States, std. longitude must be negative.

- These fields can be auto-populated from a .gpx file or manually populated.
  - Auto-population is explained in the last portion of this appendix.

Coordinate Source

- This field refers only to std. latitude and std. longitude.
- Choose one of the following options:
  - Auto-populated from gps
  - Auto-populated from survey grade gps
    - Contact your MO staff with questions about what is considered as a survey grade gps.
  - Estimated from other source
    - Choose when estimating coordinates based on a narrative description or PLSS information.
  - Manually entered from gps
    - Choose when coordinates were collected with a GPS unit but were not auto-populated.
  - Manually entered from post-validation
    - Choose when coordinates were collected with a GPS unit but were not auto-populated and were post-validated before entering.
    - Post-validating implies that the points were reviewed.
  - Unknown
- "Manually entered from gps, auto-populated from gps, or estimated from other source" are most commonly used.

GPS - Positional Error

- The potential distance, in meters, between the GPS coordinate location and the true location of a point observation.
- Acquired from a GPS unit.
- Only refers to the std. latitude and std. longitude fields.

GPS - PDOP

- Position dilution of precision.
- Describes the geometric strength of satellites.
- Acquired from a GPS unit.
- Only refers to the std. latitude and std. longitude fields.

Latitude and Longitude in Degrees, Minutes, Seconds

Site Table Fields Covered in This Section:

a. Lat Degrees, Lat Minutes, Lat Seconds, Long Degrees, Long Minutes, and Long Seconds
b. Lat Direction and Long Direction
c. Datum Name

Lat. degrees, lat. minutes, lat. seconds, long. degrees, long. minutes, long. seconds

- Not required.
- These coordinates can be projected in various datums, but NAD 83 or WGS 84 commonly are used.
- Coordinates are entered in degrees, minutes, seconds as opposed to decimal degrees.
- Longitude is always positive when entered in degrees, minutes, seconds.

Lat. direction, long. direction

- Not required.
- Direction must be populated in the lat. direction and long. direction fields.
    - In the United States, longitude is always west and latitude is always north.

Datum name

- Not required.
- Only associated field that must be populated when entering latitude in degrees, minutes, seconds.
- This field defines the datum for both UTM and latitude and longitude in degrees, minutes, seconds.

Notes:

- Coordinate source, GPS - positional error, and GPS - PDOP refer only to the std. latitude and std. longitude fields.
    - These fields do not refer to UTM or latitude/longitude in degrees, minutes, seconds.

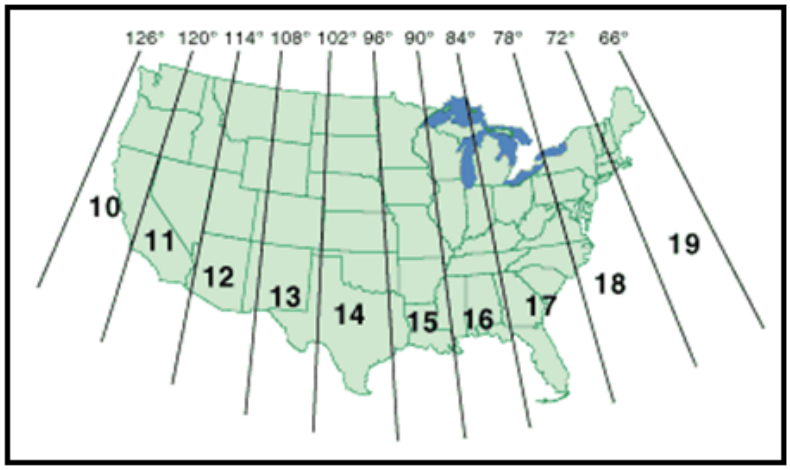
Universal Transverse Mercator (UTM)

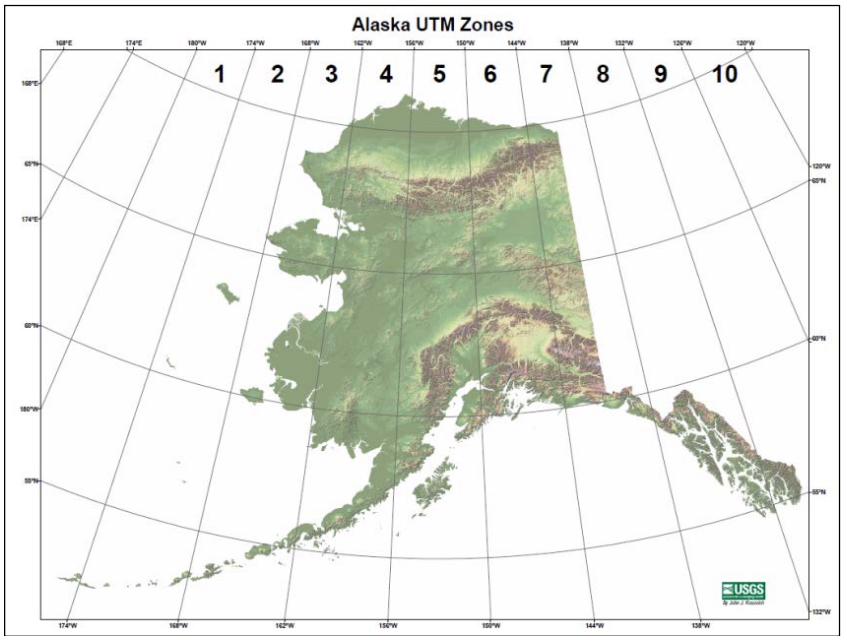
Site Table Fields Covered in This Section:

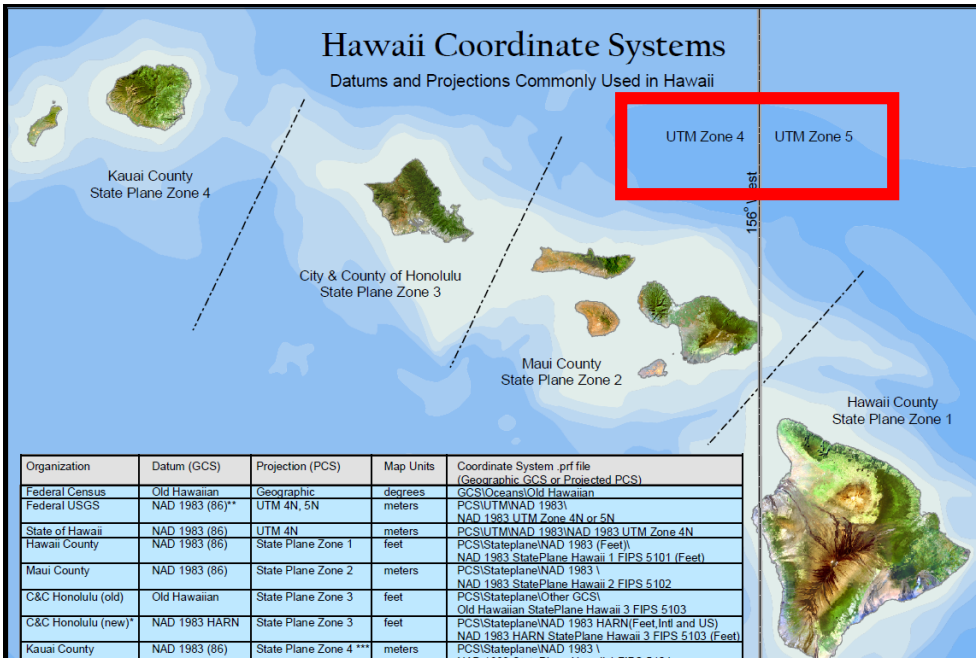
a. UTM Zone
b. UTM Northing and UTM Easting

UTM Zone

- Not required, but if entering UTMs, must populate the UTM Zone







UTM Easting and Northing

- Population of these fields is not required.
- These coordinates can be projected in various datums, but NAD 83 or WGS 84 commonly are used.
- UTM coordinates are entered in meters.

Notes:

- Only one datum name field is in NASIS. It defines the datum for both UTMs and latitude and longitude in degrees, minutes, seconds.
- Coordinate source, GPS - positional error, and GPS - PDOP refer only to the std. latitude and std. longitude fields. These fields do not refer to UTM or latitude/longitude in degrees, minutes, seconds.

2. Calculating Latitude/Longitude in a Shapefile or Feature Class

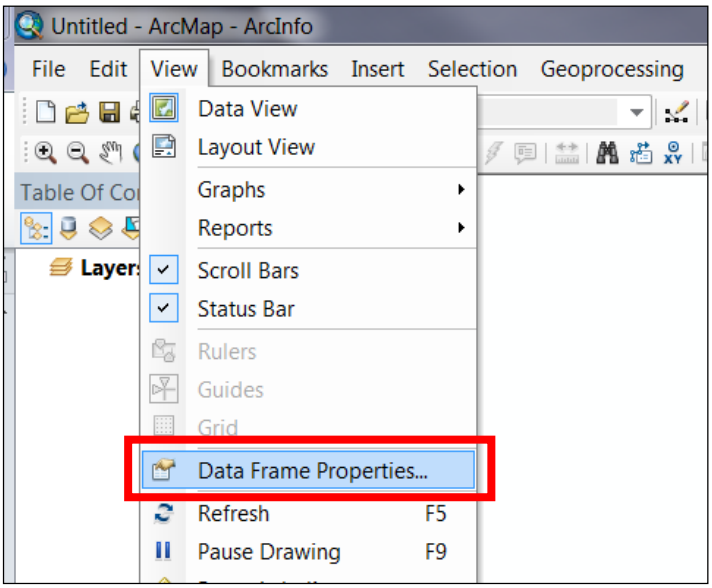
The step-by-step instructions in this section show how to use the Calculate Geometry Tool in ArcMap to calculate latitude and longitude in decimal degrees, WGS 84 for a point feature class or point shapefile. This tool will calculate the coordinates for every record (point) in the point shapefile or feature class.

The workflow overview is:

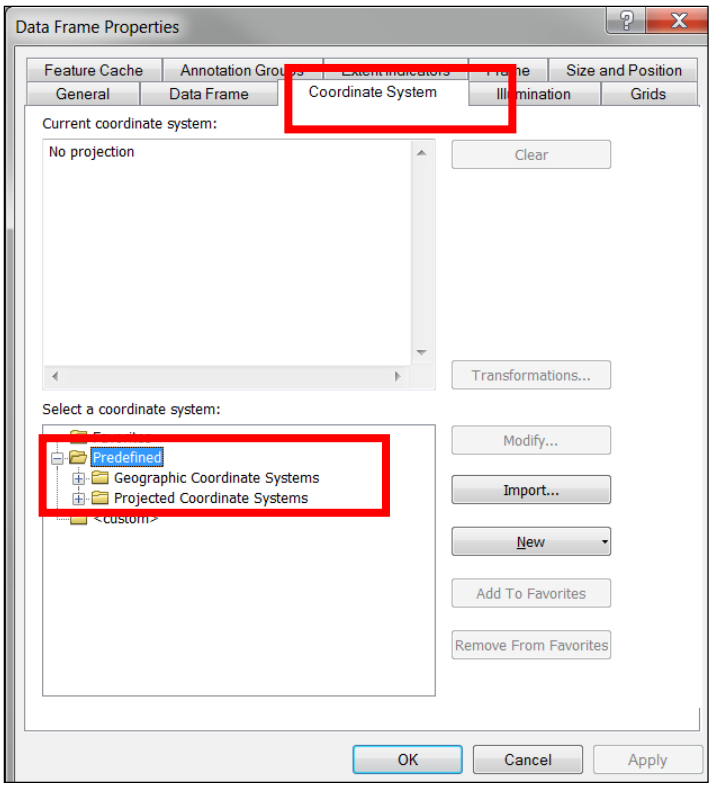
- Start with an empty ArcMap project
- Set the data frame coordinates to WGS 84
- Add your point layer
- Add new fields to the point layer
- Calculate geometry on new fields

Below are the step-by-step instructions. The instructions are the same for shapefiles and feature classes.

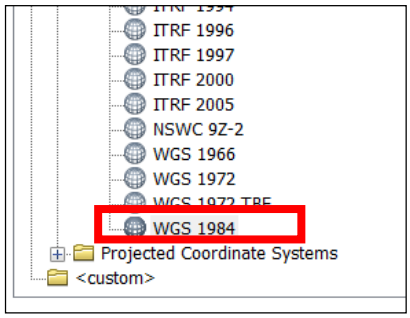
1. Open a blank .mxd in ArcMap.
2. Click View > Data Frame Properties.



3. Click the Coordinate System tab and in the "Select a coordinate system:" section, click the Predefined folder.



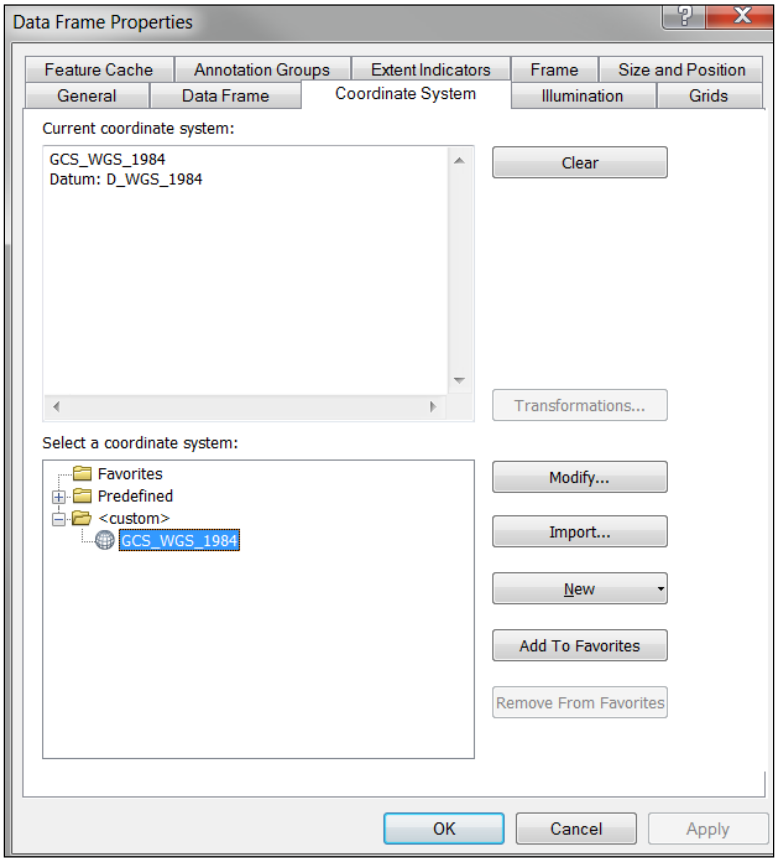
4. Click the Geographic Coordinate Systems folder to expand.
5. Click the World folder to expand.
6. Select WGS 1984.



7. Click OK.

- *The coordinate source for the data frame is now set to Geographic Coordinate System, WGS 1984.*

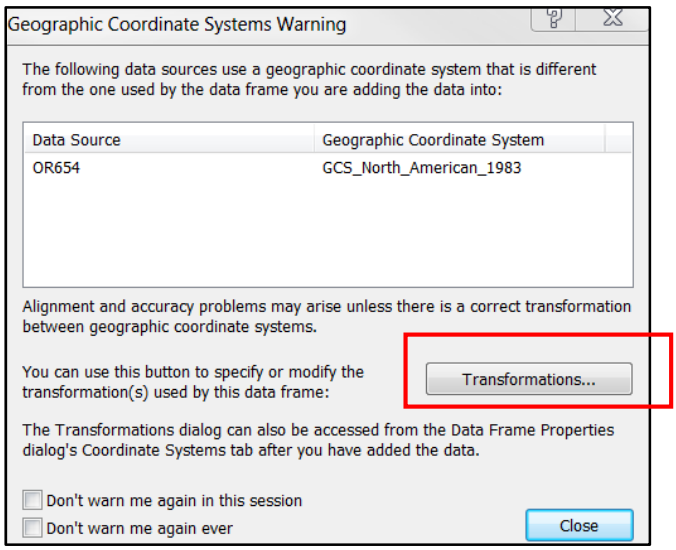
- *WGS 1984 is synonymous with WGS84.*
- *Confirm the coordinate source of the data frame by repeating steps 2 and 3. The image below will appear onscreen.*



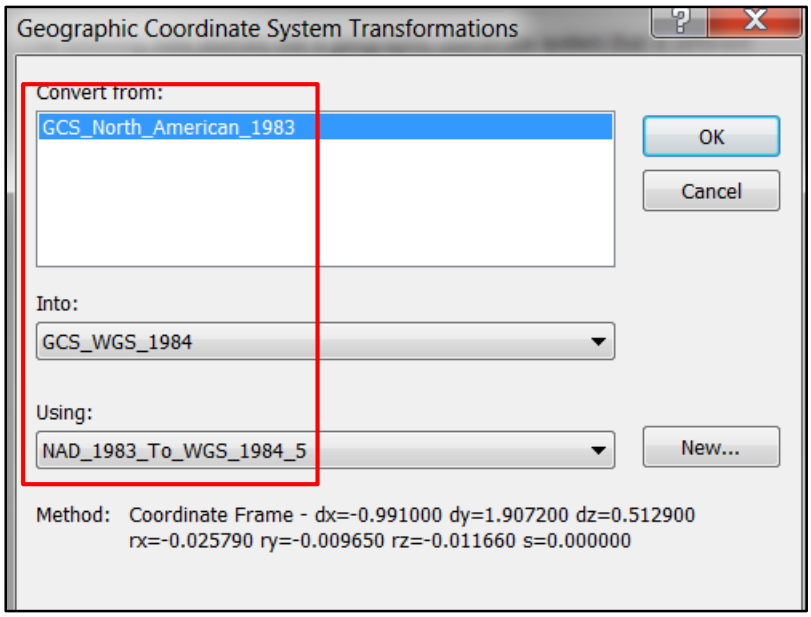
8. Click Add Data and load your point feature class or shapefile.

This process assumes you are going to load a shapefile or feature class that is using the NAD83 datum. This means that ArcMap needs to know what transformation to use in order to convert NAD83 into WGS84. There reason there are different transformation is because different parts of the globe each have their own transformation. When converting NAD83 to WGS84, North America always uses the "NAD_1983_To_WGS_1984_5" transformation.

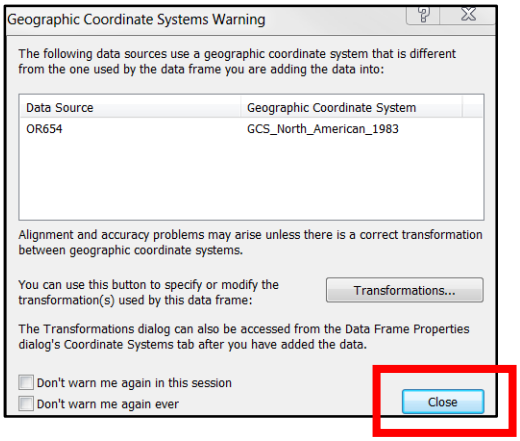
9. Click Transformations



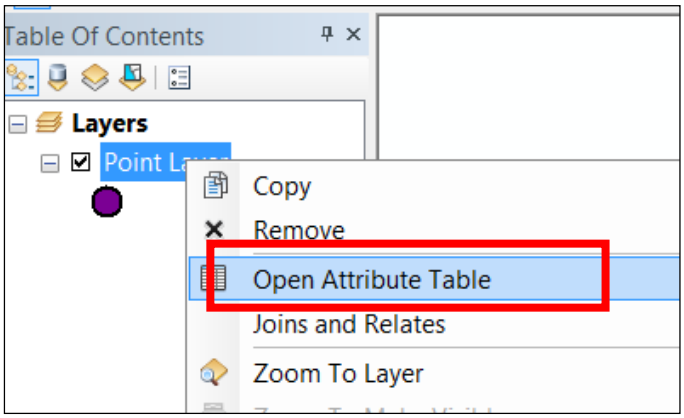
10. Enter the same parameters as in the screen shot below > Click Ok



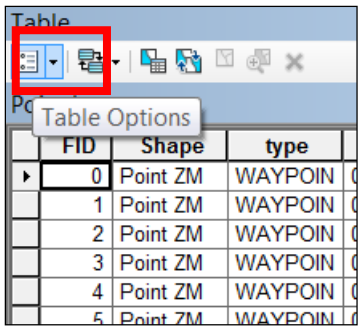
11. Click close on the next screen

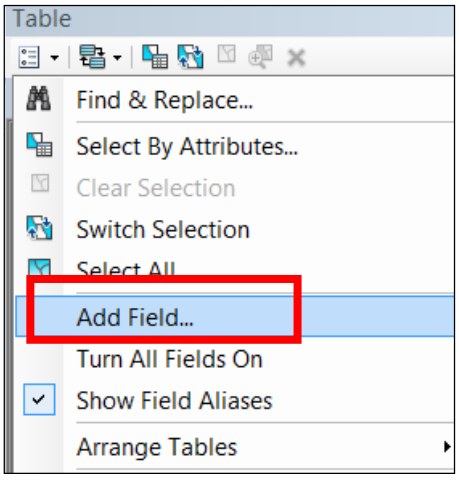


12. Right click your point feature class or shapefile and choose Open Attribute Table.

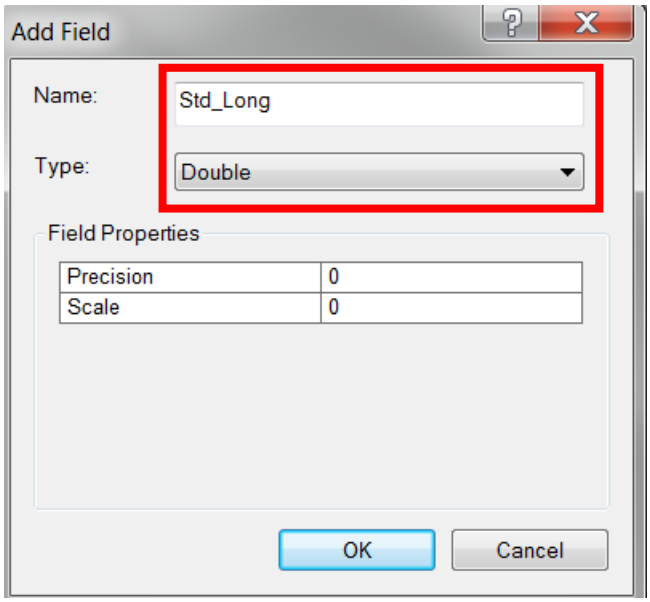


13. Click Table Options > Add Field.





14. Enter Std_Long as the name, and select Double as the type.

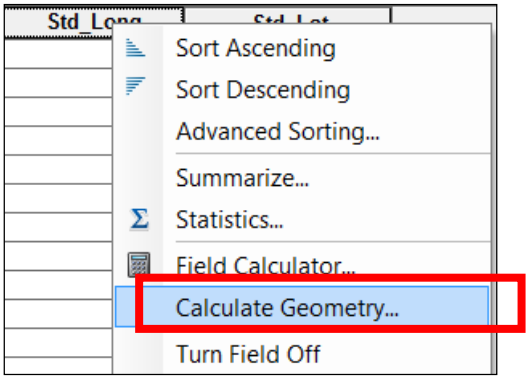


15. Click OK.
16. Repeat steps 11-12, but enter Std_Lat as the name.

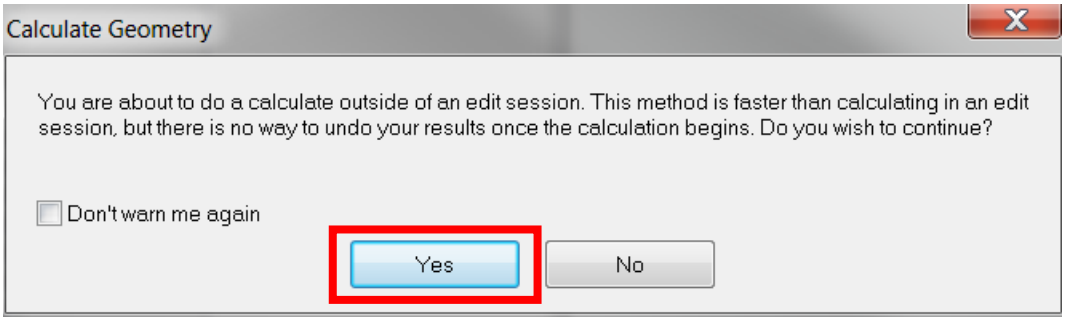
- *These two fields are in the Attribute table:*

Std_Long	Std_Lat
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0

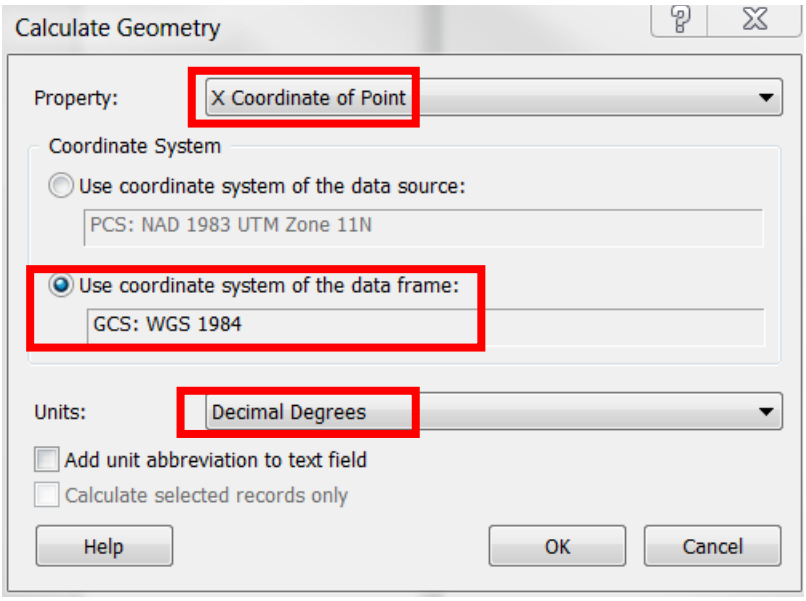
17. Right click on the Std_Long field (right click on the Std_Long header).
18. Choose Calculate Geometry.



19. Click Yes if the following message appears.



20. Choose X Coordinate of Point as the property.
    a. Click Use coordinate system of the data frame (should show GCS: WGS 1984).
21. Choose Decimal Degrees as the units.



- *Longitude coordinates are on the X axis.*
- *Latitude coordinates are on the Y axis.*

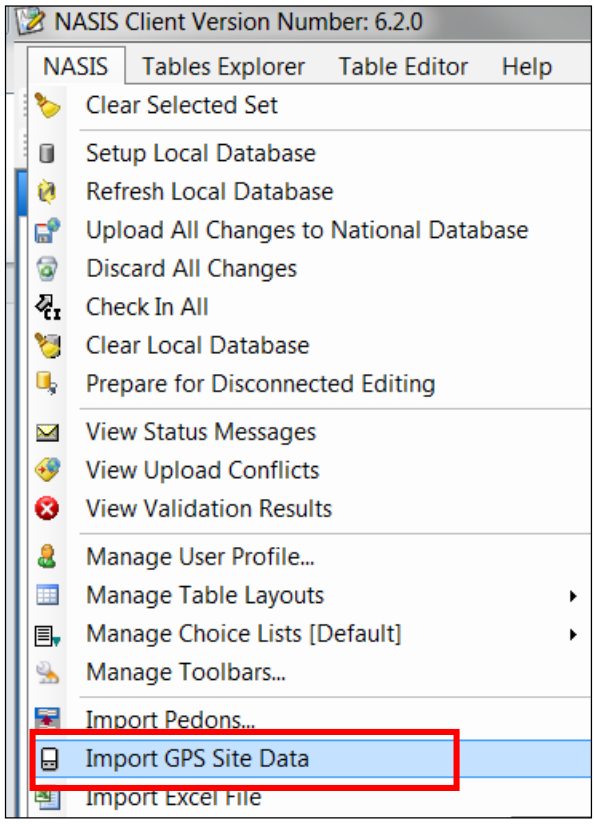
22. Repeat steps 15-19 for Std_Lat, but select Y Coordinate of Point as the property for this field.

- *Something similar to the screenshot below should appear.*
- *These coordinates are all in the WGS 84 Geographic Coordinate Source.*
- *They are in the correct format for entry into the std. longitude and std. latitude fields in the NASIS Site table.*
- *Notice how the Std_Long values are all negative. Longitude coordinates in decimal degrees are displayed this way in the United States.*

Std_Long	Std_Lat
-122.654766	45.530032
-122.654766	45.530032
-122.654766	45.530032
-122.654766	45.530032
-121.386855	44.964839
-121.38682	44.964774
-121.385148	44.965358
-121.385051	44.965149
-121.384796	44.965622
-121.384794	44.965533
-121.37913	44.966505
-121.37836	44.966356
-121.37821	44.966209
-121.378289	44.966062

3. How to Use the Import GPS Site Data Tool in NASIS

NASIS 6.2 includes a function called Import GPS Site Data. It is located in the NASIS drop-down menu.



This function auto-populates the std. longitude, std. latitude, and user site ID fields from a .gpx file.

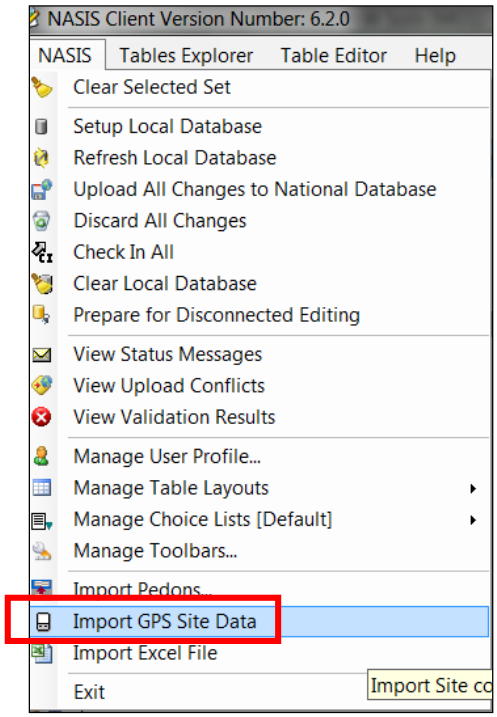
A .gpx file can be created in DNR GPS 6.0, or it can be created by converting a feature class or shapefile into the GPX format. GPX stands for “GPS Exchange Format”. It is a universal data format for exchanging GPS data between programs. Coordinates in the .gpx file always include decimal degrees in WGS 84.

Guidance in this section will cover

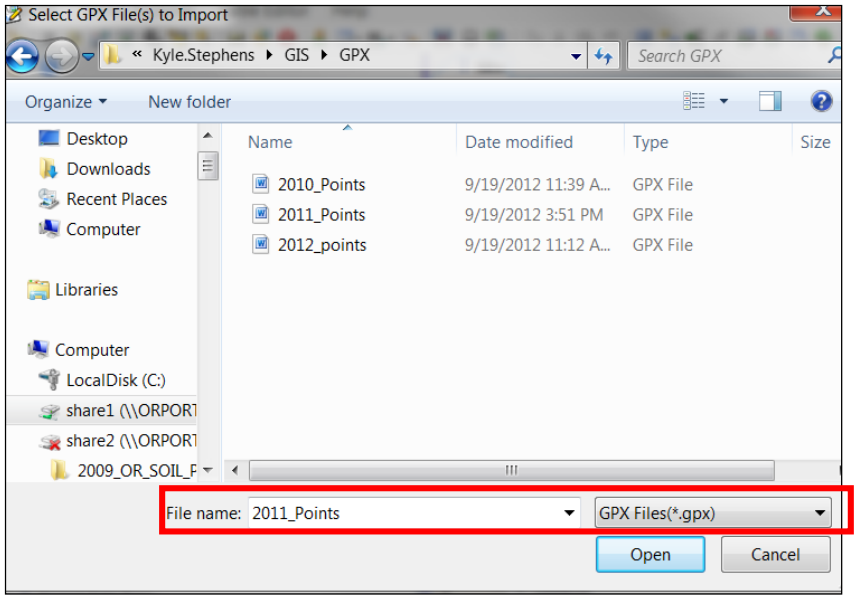
- How to import a GPX file into NASIS
- How to create GPX files in DNR GPS 6.0
- How to convert a feature class or shapefile to GPX

How to Import a GPX File into NASIS

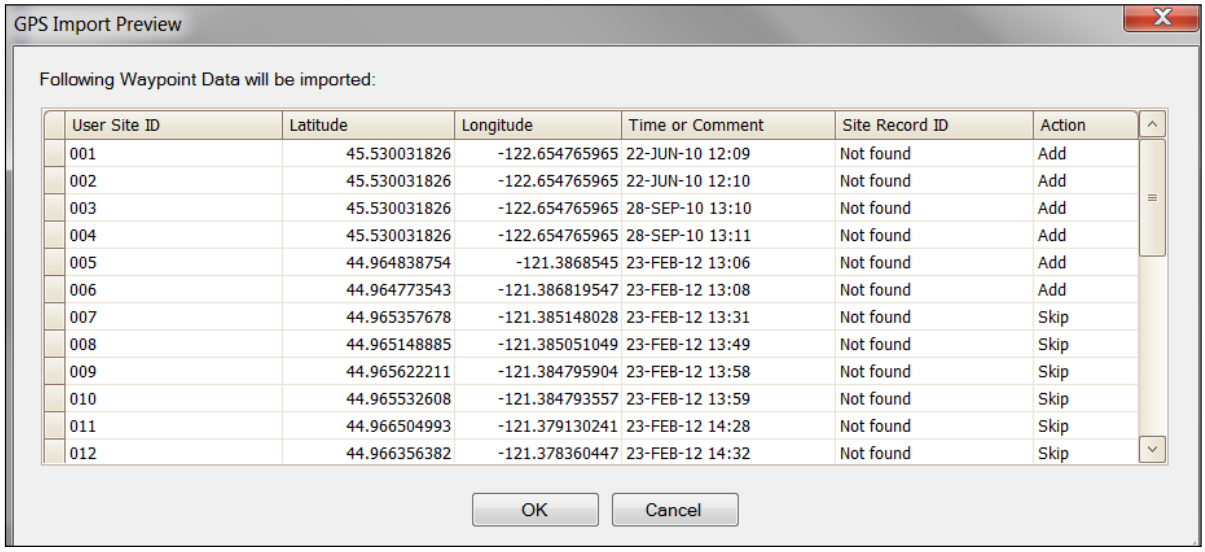
1. Open NASIS 6.2.
2. Click NASIS > Import GPS Site Data.



3. Browse to .gpx file and click Open.

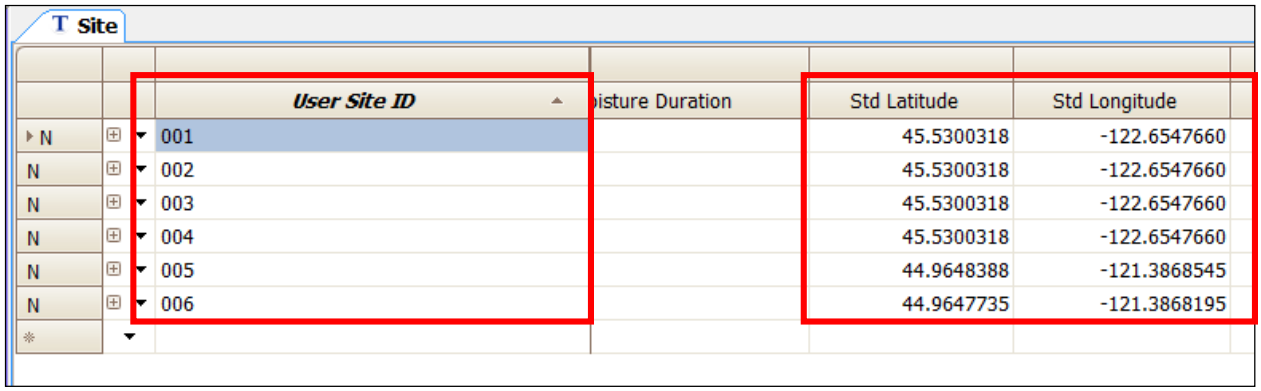


4. After the dialog box shown below opens, click OK to import data from all points.



User Site ID	Latitude	Longitude	Time or Comment	Site Record ID	Action
001	45.530031826	-122.654765965	22-JUN-10 12:09	Not found	Add
002	45.530031826	-122.654765965	22-JUN-10 12:10	Not found	Add
003	45.530031826	-122.654765965	28-SEP-10 13:10	Not found	Add
004	45.530031826	-122.654765965	28-SEP-10 13:11	Not found	Add
005	44.964838754	-121.3868545	23-FEB-12 13:06	Not found	Add
006	44.964773543	-121.386819547	23-FEB-12 13:08	Not found	Add
007	44.965357678	-121.385148028	23-FEB-12 13:31	Not found	Skip
008	44.965148885	-121.385051049	23-FEB-12 13:49	Not found	Skip
009	44.965622211	-121.384795904	23-FEB-12 13:58	Not found	Skip
010	44.965532608	-121.384793557	23-FEB-12 13:59	Not found	Skip
011	44.966504993	-121.379130241	23-FEB-12 14:28	Not found	Skip
012	44.966356382	-121.378360447	23-FEB-12 14:32	Not found	Skip

- After clicking OK, the sites should be imported. The user site ID, std. latitude, and std. longitude fields should all be populated. See screenshot below for an example.

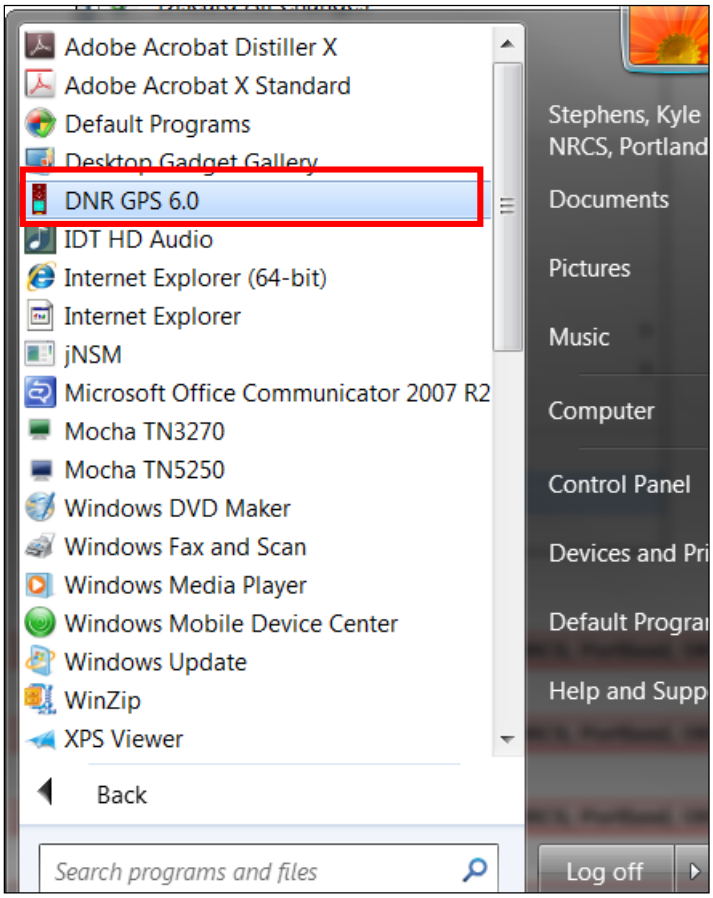


- *Several options are in the Action column:*
  - *Add*
    - *Choose this to add new sites.*
  - *Skip*
    - *Choose this if a particular site should not be added.*
    - *In the example above, 007-012 was not imported into NASIS.*
  - *Update*
    - *Choose this to update information for sites that are already in NASIS.*
- *The user site ID in the .gpx file must match the user site ID in NASIS for this option to work.*

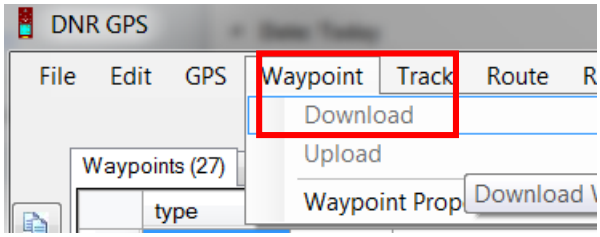
5. Click Upload All Changes to National Database to save your new sites.
6. Begin populating sites with additional information and link to pedons.

How to Create a GPX File in DNR GPS 6.0

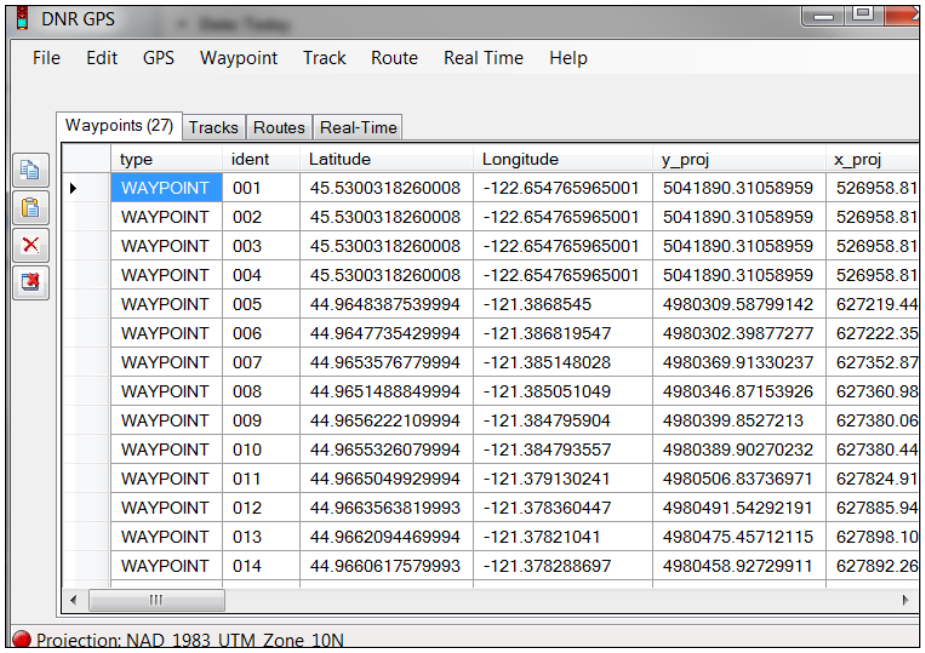
1. Hook up the Garmin GPS unit to the computer and turn it on.
2. Open the DNR GPS 6.0 program.



3. At the top of menu bar, click Waypoint > Download.

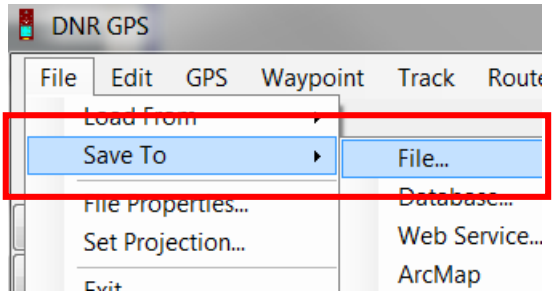


- *Something similar to the screenshot below should appear:*

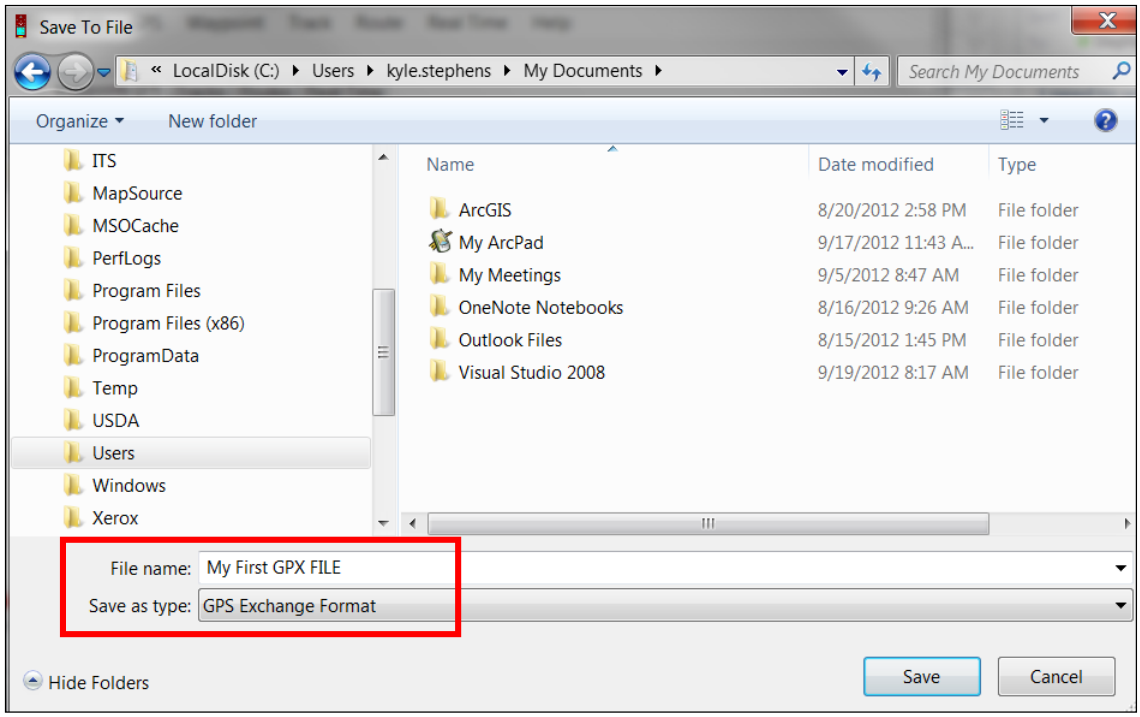


type	ident	Latitude	Longitude	y_proj	x_proj
WAYPOINT	001	45.5300318260008	-122.654765965001	5041890.31058959	526958.81
WAYPOINT	002	45.5300318260008	-122.654765965001	5041890.31058959	526958.81
WAYPOINT	003	45.5300318260008	-122.654765965001	5041890.31058959	526958.81
WAYPOINT	004	45.5300318260008	-122.654765965001	5041890.31058959	526958.81
WAYPOINT	005	44.9648387539994	-121.3868545	4980309.58799142	627219.44
WAYPOINT	006	44.9647735429994	-121.386819547	4980302.39877277	627222.35
WAYPOINT	007	44.9653576779994	-121.385148028	4980369.91330237	627352.87
WAYPOINT	008	44.9651488849994	-121.385051049	4980346.87153926	627360.98
WAYPOINT	009	44.9656222109994	-121.384795904	4980399.8527213	627380.06
WAYPOINT	010	44.9655326079994	-121.384793557	4980389.90270232	627380.44
WAYPOINT	011	44.9665049929994	-121.379130241	4980506.83736971	627824.91
WAYPOINT	012	44.9663563819993	-121.378360447	4980491.54292191	627885.94
WAYPOINT	013	44.9662094469994	-121.37821041	4980475.45712115	627898.10
WAYPOINT	014	44.9660617579993	-121.378288697	4980458.92729911	627892.26

4. At the top left of the menu bar, click File > Save To > File.



5. Browse to the location where the file is to be saved.
   a. Enter a file name.
   b. Select GPS Exchange Format as the "Save as type."
   c. Click Save.



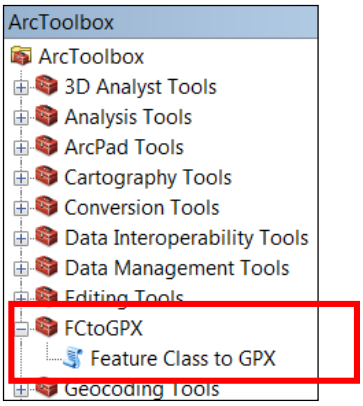
- *The GPX file is now ready to be imported into NASIS.*

How to Convert a Point Feature Class or Shapefile to GPX file

In order to convert a point feature class or shapefile into a GPX file you will need to install the "Convert Feature Class to GPX toolbox. Contact MO1 staff for assistance locating and installing this tool.

Your point layer must be in WGS 84 before it can be converted to a GPX file. Contact your MO staff if you need assistance with projecting or defining the projection of your shapefile or feature class.

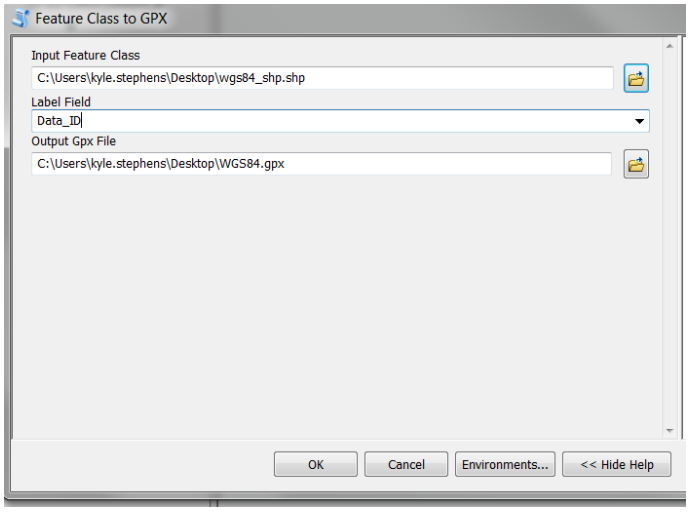
- ***This should appear after the toolbox has been installed:***



1. Right click on Feature Class to GPX to open.
2. Browse to your feature class.
3. Select a Label Field.

- *Be sure the label field is known before completing this step.*

4. Store and label the output .gpx file.
5. Click OK.



- ***The label field will become the User Site ID when the .gpx file is imported into NASIS.***

Appendix E: NASIS 6.2 Shortcut Keys and Hot Keys

Shortcut keys are key combinations that perform some action without going through a menu. They are used by pressing a letter while holding down some combination of the Ctrl, Shift, or Alt keys. This can be done at any time as long as the action is appropriate in the current context.

Hot keys are single letters that allow you to pick an option from a menu while the menu is open. To activate a menu without using the mouse, press the Alt key in combination with the menu's hot key. Then press the hot key for the menu item you want to select. When using the Alt key, the hot key for each menu item will be underlined. In some cases, two or more items on a menu will have the same hot key. In that case, continue pressing the hot key until the menu item you want is highlighted, then press Enter. To leave a menu without selecting an action, press Alt.

General Navigation	
Toggle between Menus and Explorer/Editor	Alt
Toggle between Explorer and Editor	Ctrl + Tab
Select next editor tab	Ctrl + Shift + Tab

NASIS Menu		
Action	**Shortcut**	**Hot key**
NASIS menu		
Clear selected set		C
Setup Local Database		L
Refresh Local Database		R
Upload All Changes to National Database		N
Discard All Changes		D
Check In All		I
Clear Local Database		C
Prepare for Disconnected Editing		P
View Status Messages		M
View Upload Conflicts		O
View Validation Results		V
Manage User Profile		U
Manage Table Layouts		T
Select Table Layouts		L
Save Table Layouts		S
Save Table Layouts As...		A
Restore Table Layouts to Defaults		D
Manage Choice Lists		C
Select Choice List Set...		S
Apply Default Choice Lists		A
Create New Choice List Set...		C

Manage Choice List Set...		M
Manage Toolbars...		B
Import Pedons...		I
Import GPS Site Data		G
Import Excel File		I
Exit		X
Explorers and Explorer Menu		
Action	**Shortcut**	**Hot key**
Main Explorer menu		X
Explore sub-menu		X
Queries	Ctrl + Shift + Q	Q
Tables	Ctrl + Shift + T	T
Reports	Ctrl + Shift + R	R
Interpretations	Ctrl + Shift + I	I
Calculations/Validations	Ctrl + Shift + C	C
Exports	Ctrl + Shift + E	E
Add New Query (in Queries Explorer)		Q
Add New Report (in Reports Explorer)		R
Add New Rule (in Interps Explorer)		R
Add New Evaluation (in Interps Explorer)		E
Add New Property (in Interps Explorer)		P
Add New Calculation (in Calcs Explorer)		C
Add New Validation (in Calcs Explorer)		V
Add New Export (in Exports Explorer)		E
Open	Ctrl + Shift + O	O
Check Out	Ctrl + Shift + K	O
Mark for Deletion	Ctrl + Shift + M	M
Remove Deletion Mark	Ctrl + Shift + M	M
Discard Changes		D
Check In	Ctrl + Shift + J	I
View Checkout Status	Ctrl + Shift + G	S
Run Against Local Database	Ctrl + Shift + L	L
Run Against National Database	Ctrl + Shift + N	N
Run Offline Against National Database	Ctrl + Shift + D	N
Run for Highlighted Rows	Ctrl + Shift + B	H
Run for All Rows in Selected Set	Ctrl + Shift + S	R
View Where Used	Ctrl + Shift + W	W
View Information	Ctrl + Shift + H	I
Add / Remove Favorites	Ctrl + Shift + F	F
Move to next section of Explorer	Tab	
Select Next Item in the Explorer Tree	Down/ Up Arrow	
Expand a folder or open an item	Enter	
Expand selected folder	Plus (number pad)	
Collapse selected folder	Minus (number pad)	

Form-style Editors and Editor Menus		
Action	**Shortcut**	**Hot key**
Main Editor Menu		E
Add New Query (in Query Editor)		Q
Add New Report (in Report Editor)		R
Add New Rule (in Interp Editor)		R
Add New Evaluation (in Interp Editor)		E
Add New Property (in Interp Editor)		P
Add New Calculation (in Calc Editor)		C
Add New Validation (in Calc Editor)		V
Add New Export (in Export Editor)		E
Check Out	Ctrl + K	O
Mark / Unmark for Deletion	Ctrl + M	M
Save	Ctrl + S	S
Save As...		A
Discard Changes		D
Check In	Ctrl + J	I
View Checkout Status	Ctrl + G	S
Close		C
Copy (for text)	Ctrl + C	Y
Cut (for text)	Ctrl + X	T
Paste (for text)	Ctrl + V	P
Undo (for text)	Ctrl + Z	U
Redo (for text)	Ctrl + Y	R
Find / Replace (for text)	Ctrl + R	F
Select All Rows (for tables)	Ctrl + A	A
Add New Row (for tables)	Ctrl+ Ins	R
Clear Cell (for tables)	Ctrl + Del	C
Mark Selected Rows for Deletion	Alt + Shift + D	D
Remove Deletion Mark from Rows	Alt + Shift + U	D
Run Against Local Database	Ctrl + L	L
Run Against National Database	Ctrl + N	N
Run Offline Against National Database	Ctrl + Alt + N	N
Run for Highlighted Rows	Ctrl + B	H
Run for All Rows in Selected Set	Ctrl + S	R
View Where Used	Ctrl + W	W
View Information	Ctrl + H	I
Add / Remove Favorites	Ctrl + F	F
Move to next field in the form	Tab	
Select General sub-tab	Alt + G	
Select Query sub-table (in Query editor)	Alt + Q	
Select Report sub-table (in Report editor)	Alt + R	

Select Rule sub-table (in Rule editor)	Alt + R	
Select Property sub-table (in Property editor)	Alt + P	
Select Evaluation sub-table (in Eval editor)	Alt + V	
Select Calculation/Validation sub-tab	Alt + C	
Select Rating Classes table (in Rule editor)	Alt + C	
Select Text sub-tab	Alt + T	

Table Editors and Table Menu		
Action	**Shortcut**	**Hot key**
Main Editor Menu		E
Close		C
Copy (for text)	Ctrl + C	Y
Cut (for text)	Ctrl + X	T
Paste (for text)	Ctrl + V	P
Undo (for text)	Ctrl + Z	U
Select All Rows	Ctrl + A	A
Add New Row	Ctrl+ Ins	R
Check Out Selected Trees	Alt + Shift + K	O
Clear Cell	Ctrl + Del	C
Mark Selected Rows for Deletion	Alt + Shift + D	D
Remove Deletion Mark from Rows	Alt + Shift + U	D
Copy Selected Rows	F5	Y
Copy Selected Trees	F6	Y
Cut Selected Rows	Shift + F5	T
Cut Selected Trees	Shift + F6	T
Paste Rows/Trees(insert)	F7	P
Paste Rows/Trees(replace)	Shift + F7	P
Discard Changes in Selected Trees		
Check In Selected Trees	Alt + Shift + J	I
View Checkout Status	Alt + Shift + G	S
Find Related for Selected Row		F
Load Related for Selected Rows		L
Change Owner of Selected Rows		O
Remove Rows from Selected Set		R
View Where Used for Selected Row	Alt + Shift + W	W
View Information	Ctrl + H	I
Move to next column in the same row	Tab	
Move to next row	Down/ Up Arrow	
Expand the child view of the selected row	Ctrl + plus	
Collapse the child view of the selected row	Ctrl + Minus	
Select the next table in the child view	Ctrl + Space	
* Edit Cell	F2	
* Open/Close Choice List	F4	

* Functions not listed on the menus or toolbars

F2: When in a cell of a table, F2 switches between selecting the whole cell contents and activating the text cursor to edit in the cell.

F4: When a cell of a table has a drop-down choice list or text editing box, F4 opens or closes the drop-down list or the box.