

TECHNICAL NOTES

August 25, 2004

MO-1 Technical Note Number 45

Re: NASIS Taxonomic Unit Descriptions

This Technical Note provides guidance on using an MO-1 NASIS report to create Taxonomic Unit Descriptions (TUDs) for soil survey manuscripts. Using NASIS to create both TUDs and mapunit descriptions will significantly reduce the amount of cross checking between these documents and the NASIS database. The TUD report aggregates data elements such as slope, elevation, and mean annual precipitation so that the entire range is displayed for all components of the taxonomic unit. The name of the current report is "TUD – MO-1 Taxonomic Unit Descriptions ver. 2.0". Additional TUD reports may be added in the future for survey areas with special requirements. The TUD report can also be used to develop a pedon description and location paragraph that can be pasted into official series descriptions (OSDs).

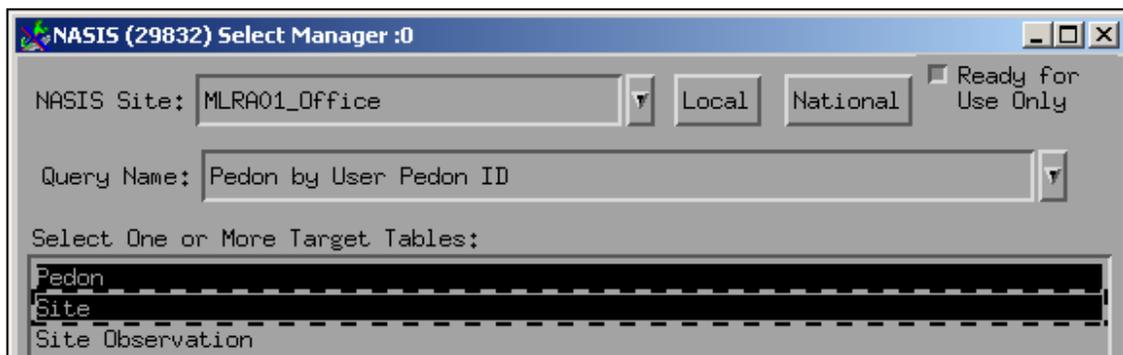
In order to use the MO-1 NASIS TUD report, certain data elements need to be populated and loaded into the selected set. The following section provides detailed instructions.

Instructions

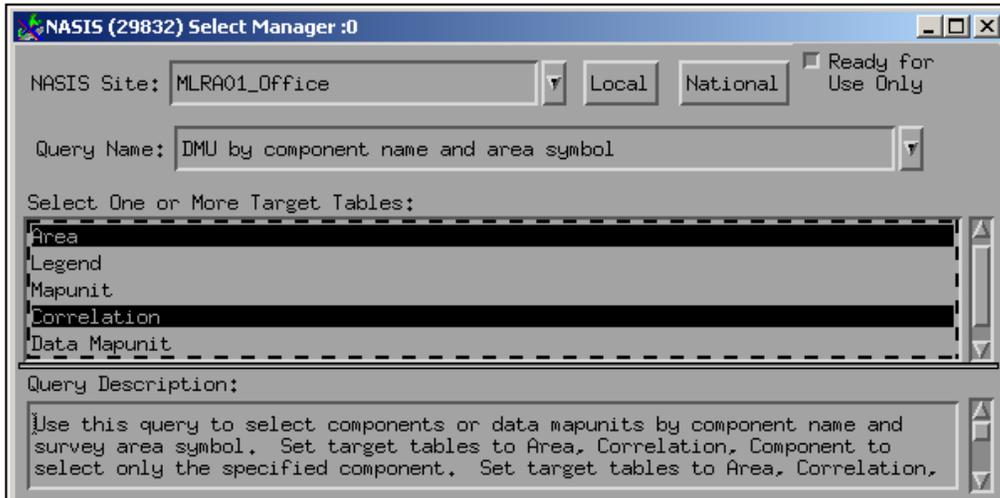
1. Enter the pedon description information for the survey area taxonomic unit modal pedon into NASIS. This pedon may be the Official Series Description (OSD) type location if it occurs within the survey area. Follow the instructions for populating the Site and Pedon object tables according to the instructions in the MO-1 NASIS Pedon Thunderbook, which is available at http://www.or.nrcs.usda.gov/pnw_soil/mo1_techinfo.html. Assign User Pedon ID's and User Site ID's according to the instructions in MO-1 Technical Note 29, which is also available at the above web site.

The soil mapunit in which the pedon description occurs should be populated in the Site Mapunit Overlap table. Also populate the USGS 7.5 minute quad name in the Site Area Overlap table if you want it to be in the TUD report.

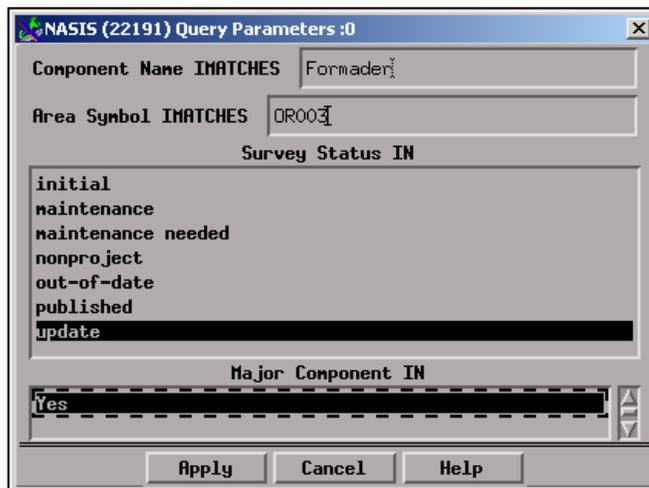
2. If the Site and Pedon tables are not in your selected set, run the MO-1 query "Pedon by User Pedon ID" to load the modal pedon data. Select the Site and Pedon target tables. Only one pedon should be loaded to create the TUD



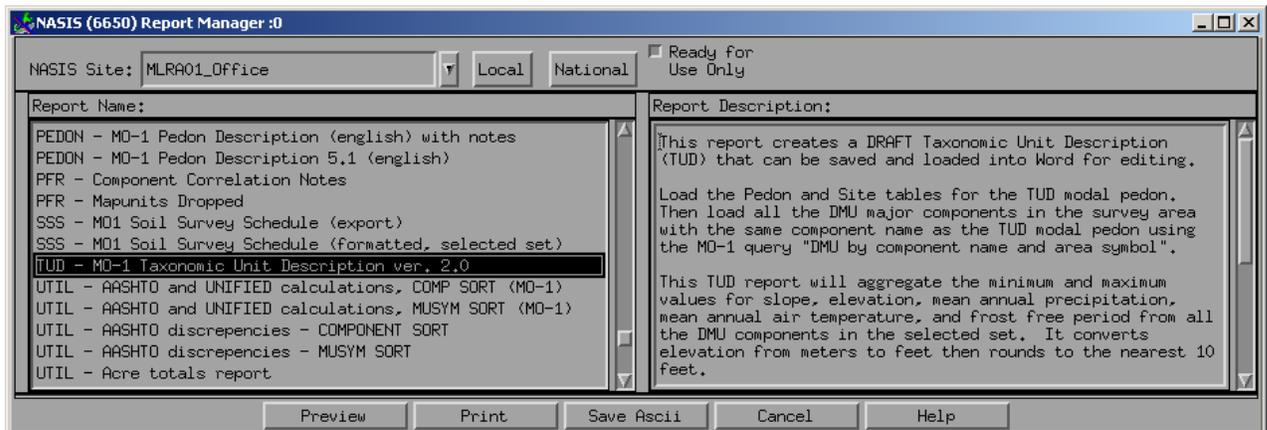
- Load all the taxonomic unit major components in the Data Mapunit object. For example, if the pedon description is the modal pedon for the “Formader” series in a survey area, load all the “Formader” Data mapunit major components that occur in the survey area. An MO-1 query that can be used is “DMU by component name and area symbol”. Select the target tables Area, Correlation, Component.



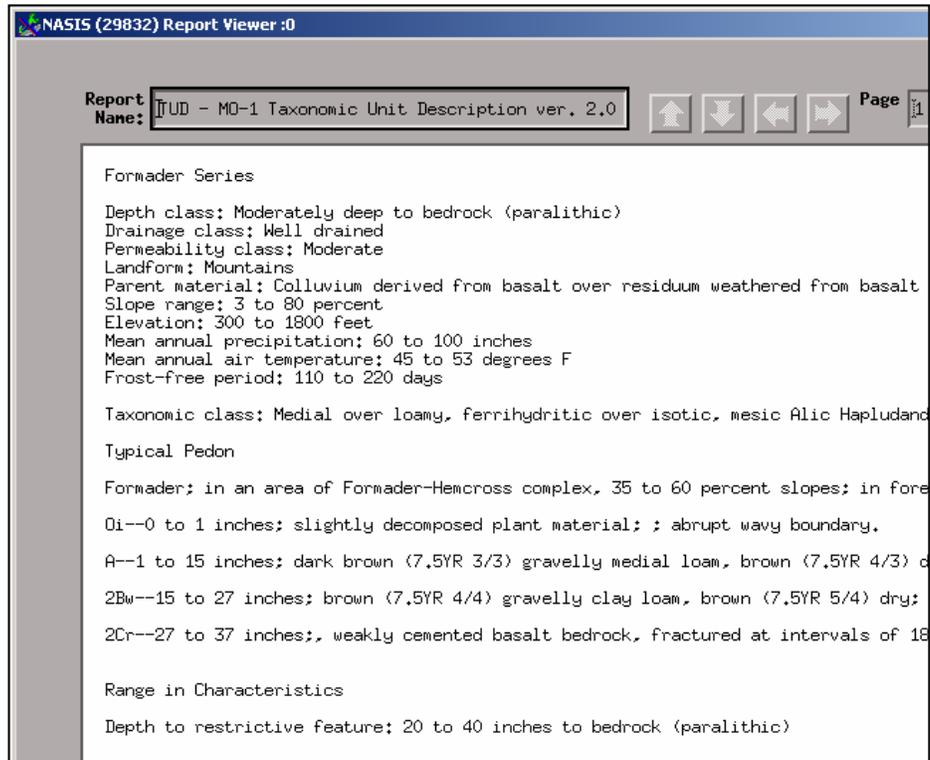
These query parameters will load all the Formader major components in the OR003 survey area.



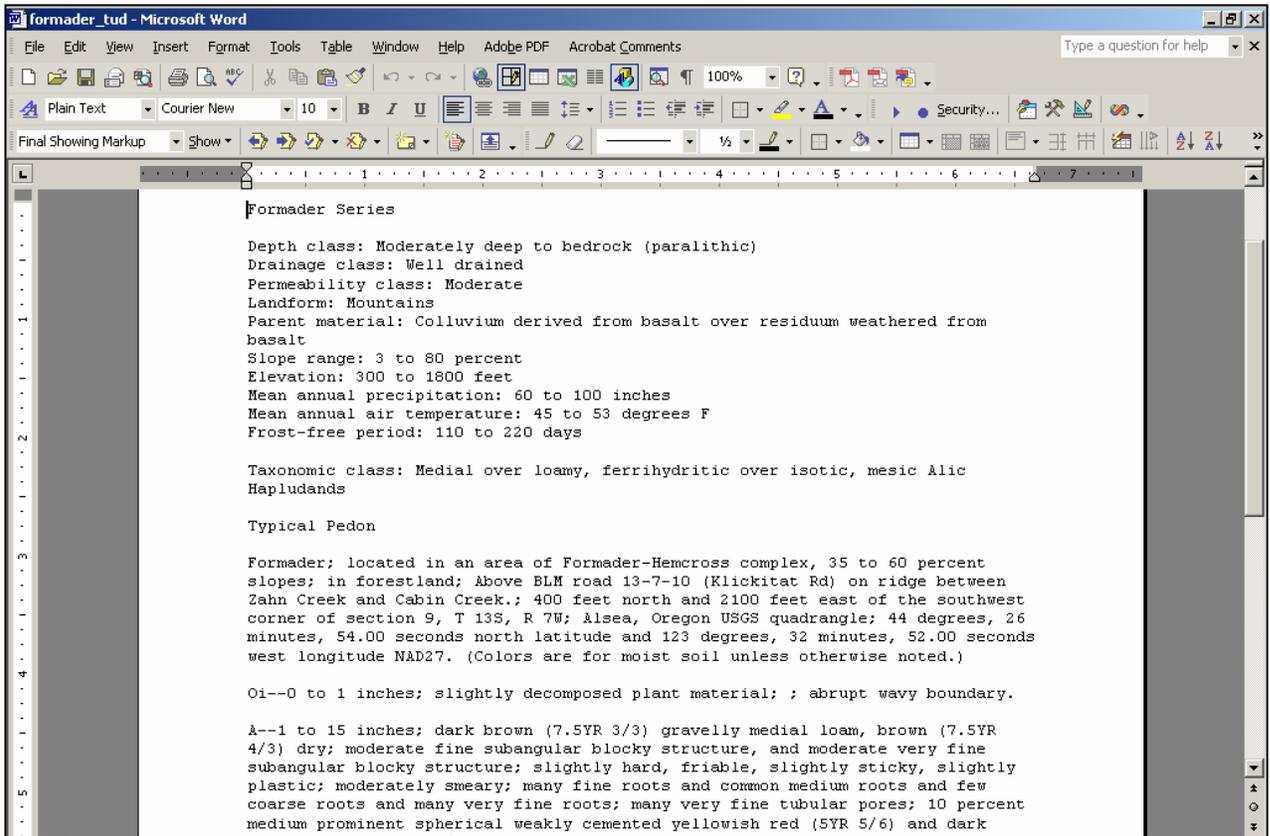
- Preview or Save the NASIS report “TUD - MO-1 Taxonomic Unit Description ver. 2.0”



When the TUD report is previewed, each horizon description will appear as a continuous text string without line breaks. The report is formatted in this way to avoid extra paragraph marks when the TUD is opened and edited in a word processing program such as Microsoft Word.



- Download the TUD report using NASIS Secure Access. Open the report in Microsoft Word and edit as necessary. Save the file as a Word document (.doc extension)



6. The TUD report from NASIS is unformatted and uses a Courier New 10 point font. A Microsoft Word macro is available that will format the TUD report in a soil survey report manuscript style. The macro needs to be installed on each computer that will be used to format TUDs.

To install and run the macro, download the file named “MO1_TUD_macro_8_2004.doc” from the MO-1 FTP site at <ftp://199.158.95.16/oregonftp/soil/outgoing/> and follow the instructions.

The following is an example of a TUD which has been formatted with the MO-1 macro:

Formader Series

Depth class: Moderately deep to bedrock (paralithic)

Drainage class: Well drained

Permeability class: Moderate

Landform: Mountains

Parent material: Colluvium derived from basalt over residuum weathered from basalt

Slope range: 3 to 80 percent

Elevation: 300 to 1800 feet

Mean annual precipitation: 60 to 100 inches

Mean annual air temperature: 45 to 53 degrees F

Frost-free period: 110 to 220 days

Taxonomic class: Medial over loamy, ferrihydritic over isotic, mesic Alic Hapludands

Typical Pedon

Formader gravelly medial loam; in an area of Formader-Hemcross complex, 35 to 60 percent slopes; in forestland; Above BLM road 13-7-10 (Klickitat Rd) on ridge between Zahn Creek and Cabin Creek.; 400 feet north and 2100 feet east of the southwest corner of section 9, T 13S, R 7W; USGS Alsea, Oregon topographic quadrangle; 44 degrees, 26 minutes, 54 seconds north latitude and 123 degrees, 32 minutes, 52 seconds west longitude NAD 27. (Colors are for moist soil unless otherwise noted.)

Oi--0 to 1 inch; slightly decomposed plant material; abrupt wavy boundary.

A--1 to 15 inches; dark brown (7.5YR 3/3) gravelly medial loam, brown (7.5YR 4/3) dry; moderate fine and very fine subangular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; moderately smeary; many very fine and fine roots, common medium roots, and few coarse roots; many very fine tubular pores; 10 percent medium prominent spherical weakly cemented yellowish red (5YR 5/6) and dark reddish brown (5YR 3/2) iron-manganese concretions with clear boundaries throughout; 25 percent subangular moderately cemented basalt paragravel and 20 percent subangular strongly cemented basalt gravel; very strongly acid (pH 5.0); NaF pH >9.5; clear smooth boundary.

2Bw--15 to 27 inches; brown (7.5YR 4/4) gravelly clay loam, brown (7.5YR 5/4) dry; moderate fine subangular blocky structure; hard, firm, slightly sticky, slightly plastic; weakly smeary; common very fine and fine roots, few medium and coarse roots; many very fine tubular pores; 10 percent medium prominent spherical weakly cemented reddish yellow (5YR 6/6) and dark reddish brown (5YR 3/3) iron-manganese concretions with clear boundaries throughout; 25 percent subangular strongly cemented basalt gravel and 30 percent subangular moderately cemented basalt paragravel; very strongly acid (pH 4.8); NaF pH 9.0; abrupt wavy boundary.

2Cr--27 to 37 inches; weakly cemented basalt bedrock, fractured at intervals of 18 to <39 inches.

Range in Characteristics

Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)

NASIS Data Sources for the TUD report.

The TUD report uses data from many NASIS tables. This section describes the data sources for each part of the report.

Formader Series Component table

Depth class: Component Restrictions table. Converts low and high top depths to the first restriction into a depth class.

Drainage class: Component table

Permeability class: Horizon table. Ksat of the most restrictive horizon (lowest Ksat) is converted to a permeability class.

Landscape: Component Geomorphic Description table. If components have multiple landscapes, they will all be listed separated by commas. This row will not appear in the TUD if "landscape" has not been populated.

Landform: Component Geomorphic Description table. If components have multiple landforms, they will all be listed separated by commas.

Parent material: Component Parent Material Group table. If components have multiple parent materials, they will all be listed separated by commas.

Slope range: Component table. The aggregated low and high range for all data mapunit components in the selected set will be displayed. For example, if one component has a slope range of 0 to 5 percent, and another has a slope range of 5 to 15 percent, the displayed range will be 0 to 15 percent.

Elevation: Component table. The aggregated low and high range for all data mapunit components in the selected set will be displayed.

Mean annual precipitation: Component table. The aggregated low and high range for all data mapunit components in the selected set will be displayed.

Mean annual air temperature: Component table. The aggregated low and high range for all data mapunit components in the selected set will be displayed.

Frost-free period: Component table. The aggregated low and high range for all data mapunit components in the selected set will be displayed.

Taxonomic class: Component table

Typical Pedon

Location information is from tables in the Site object for the typical pedon in the selected set. The soil mapunit in which the typical pedon occurs is from the Site Mapunit Overlap table. The 7.5 minute topographic quad name is from the Site Area Overlap table.

Moist colors will be listed first for soils with udic and aquic moisture regimes. Dry colors will be listed first for soils with xeric, aridic, and ustic moisture regimes.

The pedon description is from tables in the NASIS Pedon object. Bedrock information such as bedrock kind and hardness for R and Cr horizons is from the Site table.

Range in Characteristics

Depth to restrictive feature: Component Restrictions table. Displays low and high top depths to the first restriction followed by the restriction kind in parentheses

Editing Tips

The NASIS TUD report produces a draft taxonomic description that will require some editing and additions in a word processing program to produce a final product. This section provides some tips for editing.

Parent Material: For components with multiple parent materials, some editing may be needed. For example, the report may produce “Slope alluvium derived from basalt, colluvium derived from basalt”. This should be edited to “Slope alluvium and colluvium derived from basalt”. (Note: the NASIS Parent Material Group name can be manually edited in NASIS before running the TUD report. Further edits in a word processing program would then not be necessary.)

Roots and Pores: For horizons with multiple sizes of roots and pores, some editing will be needed. For example, the report may produce “many very fine roots and many fine roots”. This should be edited to “many very fine and fine roots”.

Rock Fragment Terms: Rock fragments for NASIS pedons are stored in the Pedon Horizon Fragments table with low, RV, and high sizes in millimeters. Terms such as “gravel” and “cobbles” are not stored.

The TUD report converts the Pedon rock fragment sizes and shape into the correct rock fragment term. For example, nonflat rock fragments with sizes ranging from 2 to 75 mm are assigned a “gravel” rock fragment term. If the rock fragment shape is not populated in the Pedon Horizon Fragments table, a default shape of “nonflat” is used. A “flat” shape should be populated for channers and flagstones. The report will also display pararock terms if the hardness is populated.

In order for the TUD report to correctly convert rock fragment sizes and shapes to the correct rock fragment term, the following size classes should be used in the Pedon Horizon Fragments table. Subdividing gravel into fine, medium, and coarse is optional (see the Field Book for Describing and Sampling Soils, version 2.0, page 2-40):

| Size | Rock Fragment Term |
|-----------------------|--------------------|
| Nonflat shape | |
| 2 – 75 mm diameter | gravel |
| 2 – 5 mm diameter | fine gravel |
| 5 – 20 mm diameter | medium gravel |
| 20 – 75 mm diameter | coarse gravel |
| 75 – 250 mm diameter | cobbles |
| 250 – 600 mm diameter | stones |
| > 600 mm diameter | boulders |
| Flat shape | |
| 20 – 150 mm long | channers |
| 150 to 380 mm long | flagstones |

Range in Characteristics: The TUD report only produces the depth to restrictive feature for this section. The remainder of the range in characteristics must be manually entered using pedon descriptions and notes collected in the survey area.