

Soil Resource Inventory Toolbox

1.1.18

User Guide

May 2008

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Chapter 1. Overview

Introduction

The Soil Resource Inventory Toolbox (SRITB) for ArcGIS provides tools and toolbars custom designed to improve the ease and efficiency of the soil data collection.

Installation

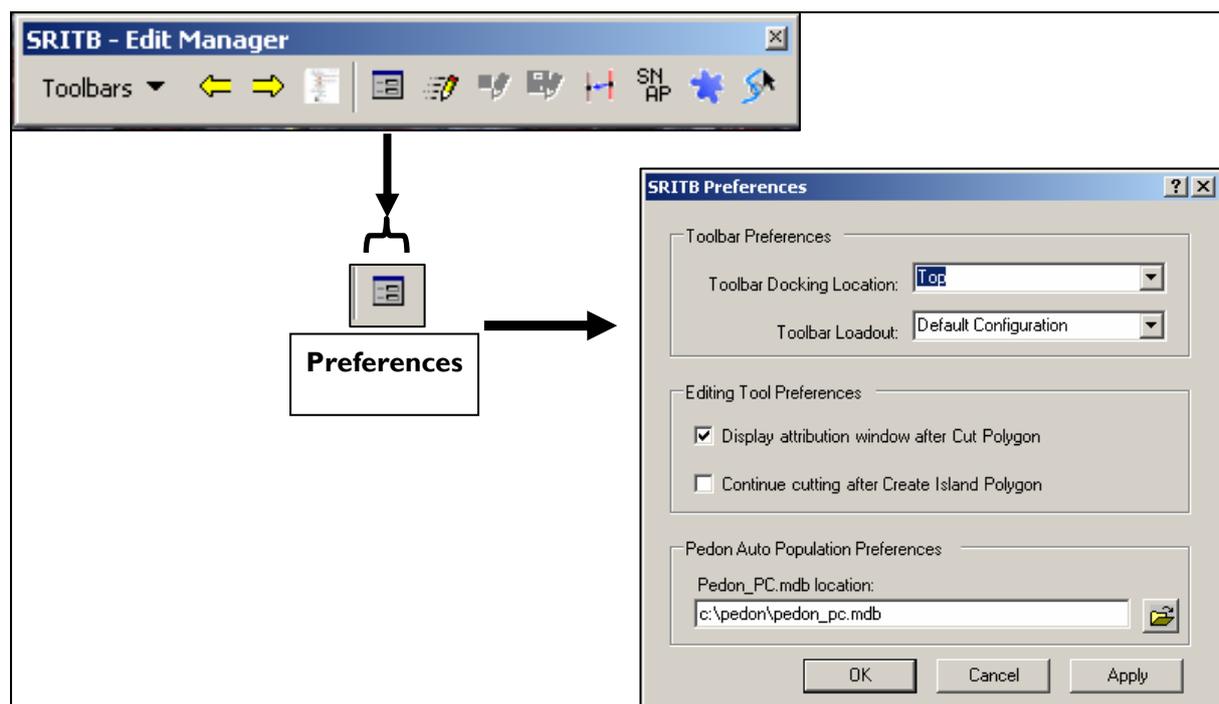
Installation requires Administrative privileges, the previous installation of ArcGIS Desktop suite, and Microsoft .NET support for ArcGIS.

To install the tools, double click the `SRITBInstaller.msi` file and proceed through the installer by clicking the Next button. After installation, you will have several new toolbars in ArcMap and ArcScene and a new extension available in ArcMap. The extension must be manually enabled in the Tools->Extensions menu of ArcMap by clicking the checkbox next to SRITB. When the extension is enabled, one of the toolbars will be displayed whenever a new document is created or opened. The Edit Task selector will be moved from the default ArcMap Editor Toolbar to the SRITB - Edit Toolbar. Several context menu options will be added to the built-in ArcMap editing context menus to increase editing efficiency.

Configuration

Soil Resource Inventory Toolbox can be customized through the preferences dialog. It is accessed through a button on the SRITB - Edit Manager toolbar. The SRITB toolbars automatically dock to one side of the screen, and can be changed from the default on the left side of the screen to the top, bottom, or right side of the screen using the dialogue box. These toolbars can be customized through the normal ArcMap Tools->Customize method. They read their initial configuration from a stored preferences file. This file can be customized and then distributed as part of a standard configuration for a group of users. If you already have custom toolbars that you prefer to continue to use, you can find the various SRITB tools through the customize dialog in the `DigitalEditing` category and place them on your own custom toolbars. Individual tools will work whether or not the SRITB Extension is enabled. For more information on the options in the preferences dialog, you can click the question mark in the upper right corner and then select your option of interest. More details are also available in other sections of this manual describing each individual tool.

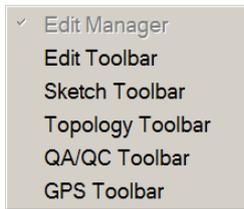
Figure 1.1. SRITB Preferences Button and Dialog



Toolbars

The Toolbox provides six toolbars designed to maximize the screen space available for editing. Only one toolbar will be displayed at a time. It will dock to one side of the screen as specified in the extension's preferences dialog. This dialog is available on the SRITB - Edit Manager toolbar by default. You can navigate to any one of the toolbars through the drop down menu or cycle through them using the yellow arrow buttons.

Figure 1.2. SRITB Toolbars Menu and Arrows



The Sketch and Topology toolbars contains a subset of the tools available on the similarly named built-in ESRI toolbars. These toolbars are primarily included for the added convenience of accessing them through the SRITB toolbar interface.

SRITB - Edit Manager

The SRITB - Edit Manager Toolbar contains the standard toolbar-switching tools and table of contents toggle. It has tools infrequently used during actual editing. Specific tools found on this toolbar are the SRITB Preferences button, start, stop, and save editing commands. These commands are followed by the Snapping Environment Toggle and the Snapping Tolerance, Sticky Move Tolerance, and Stream Mode Tolerance quick change commands. The toolbar installs with defaults set for snapping tolerance, sticky-move tolerance, and stream mode tolerance that are most appropriate for most soil line editing.

Figure 1.3. SRITB - Edit Manager Toolbar

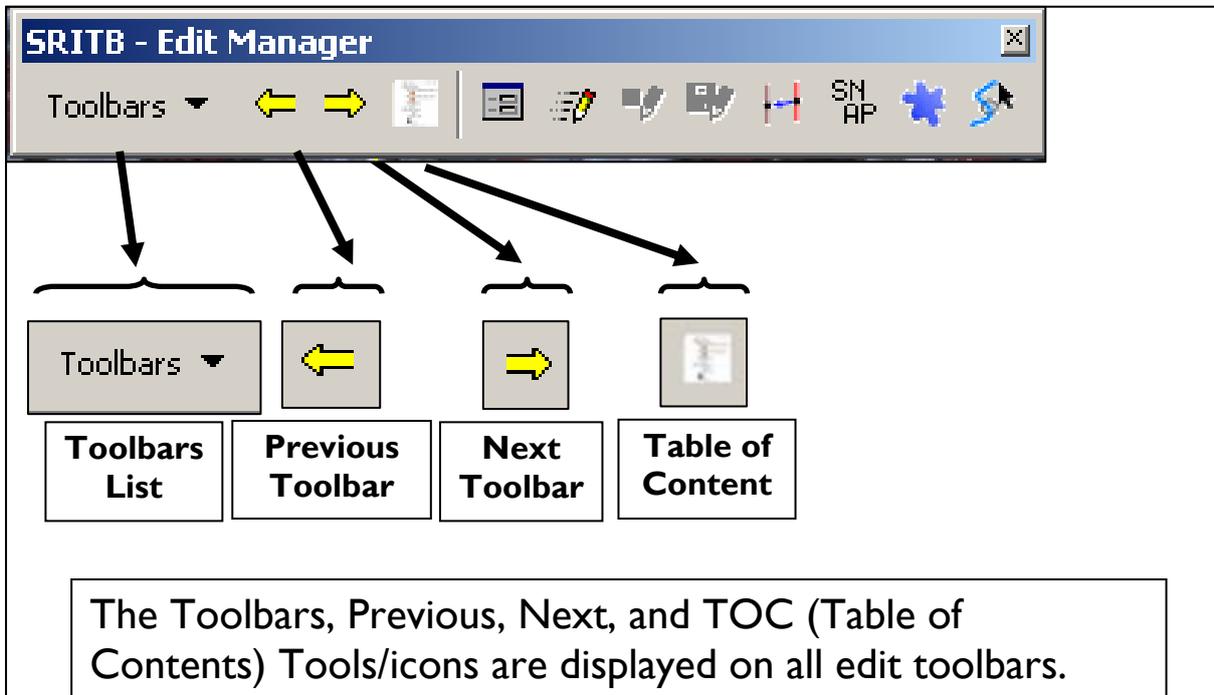


Figure 1.3a. SRITB – Editor Icons

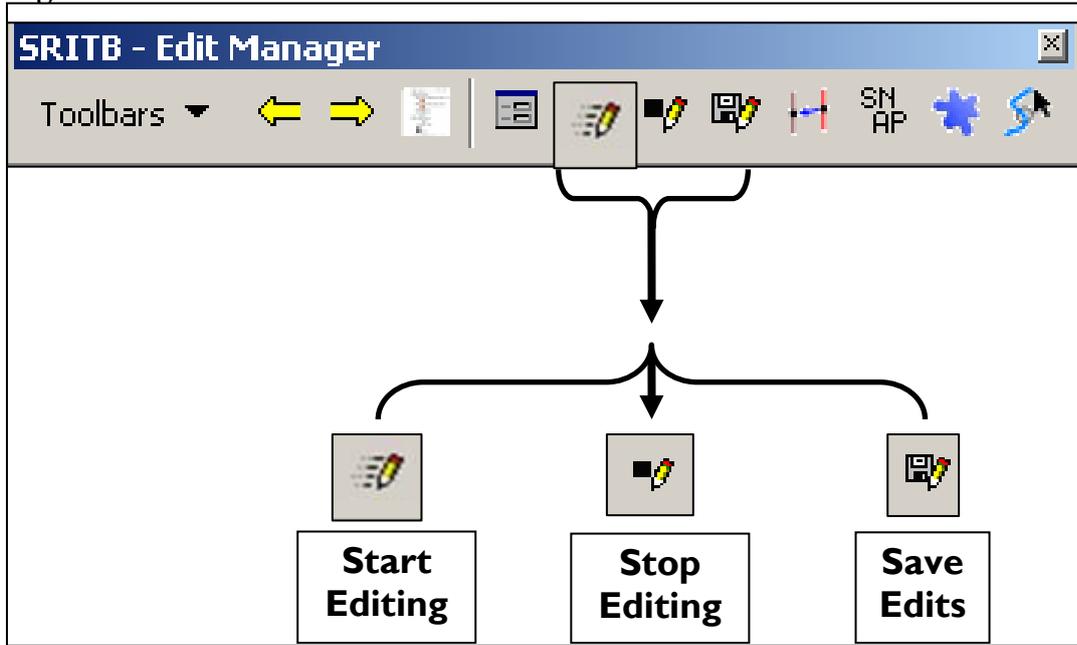
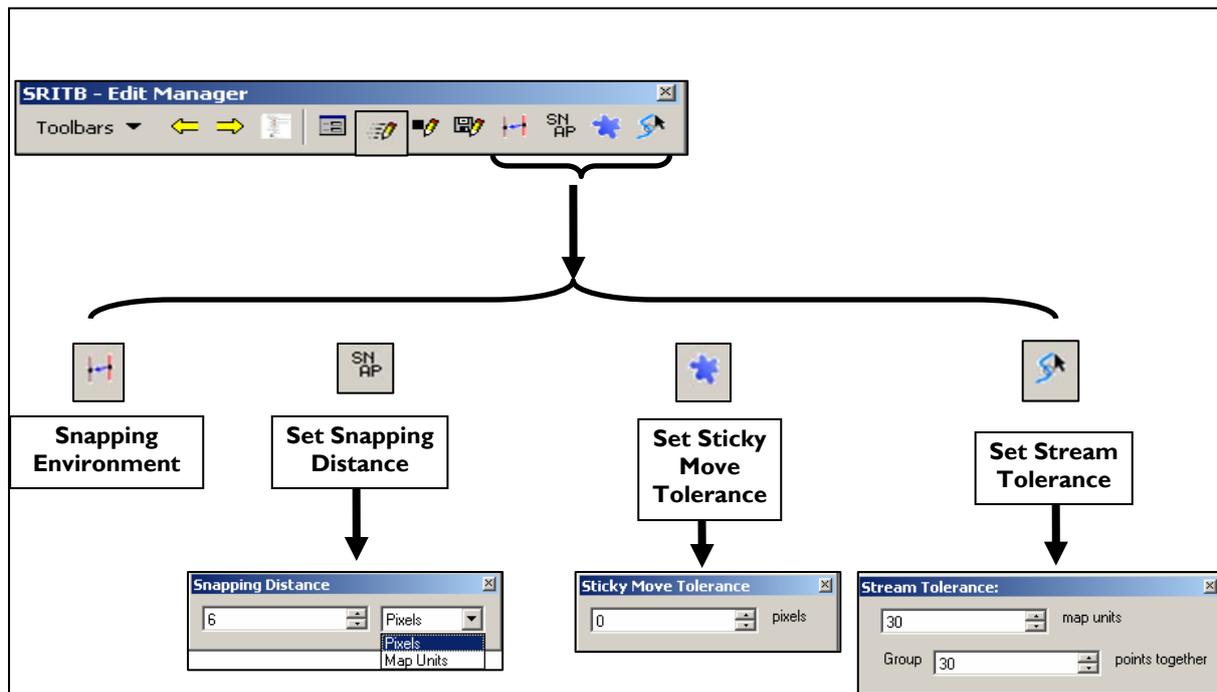


Figure 1.3b. SRITB – Tolerance Settings Icons



SRITB - Edit Toolbar

The SRITB - Edit Toolbar contains the tools most commonly used during digital soil mapping. It contains built-in ArcMap commands for Explode, Edit Attributes, Edit Task and Target Selectors, custom made Streaming toggle, Trace Lines tool, and Sketch tool.

Note

The Edit Task selector will only appear on the SRITB - Edit Toolbar if the SRITB Extension is enabled. This toolbar is also the default location of the custom editing tools which are described in full in Chapter 2 – Digital Editing Tools – Section: Custom Tools. Three common topology tools are also included on this toolbar: Clear Selected Topology Elements, Validate Topology in Selected Area, and Fix Topology Errors.

Figure 1.4. SRITB - Edit Toolbar

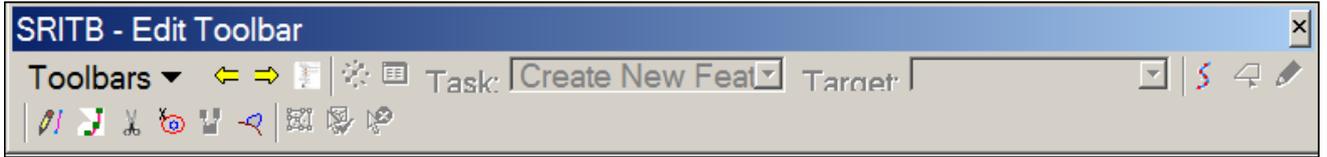
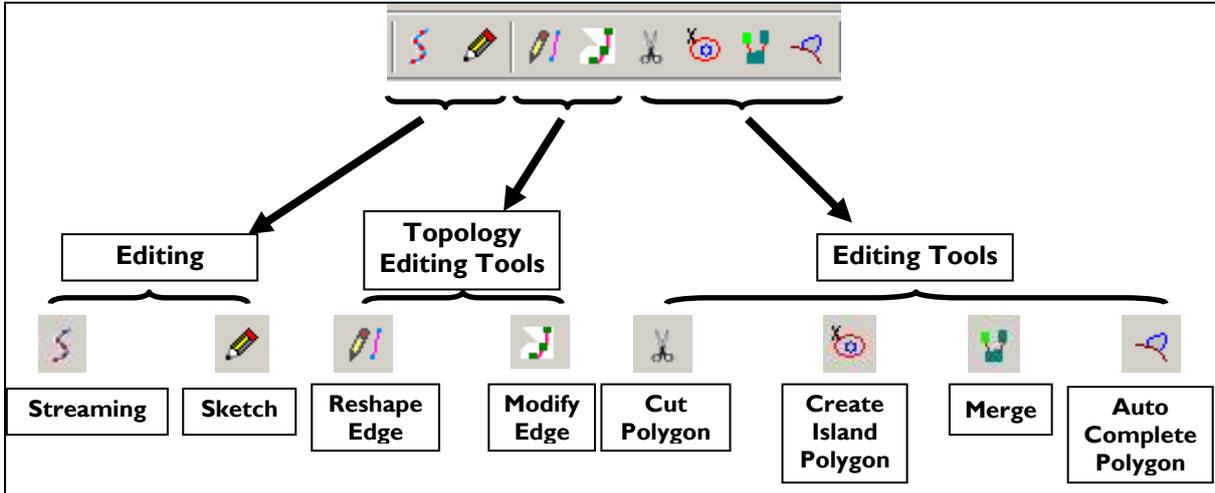


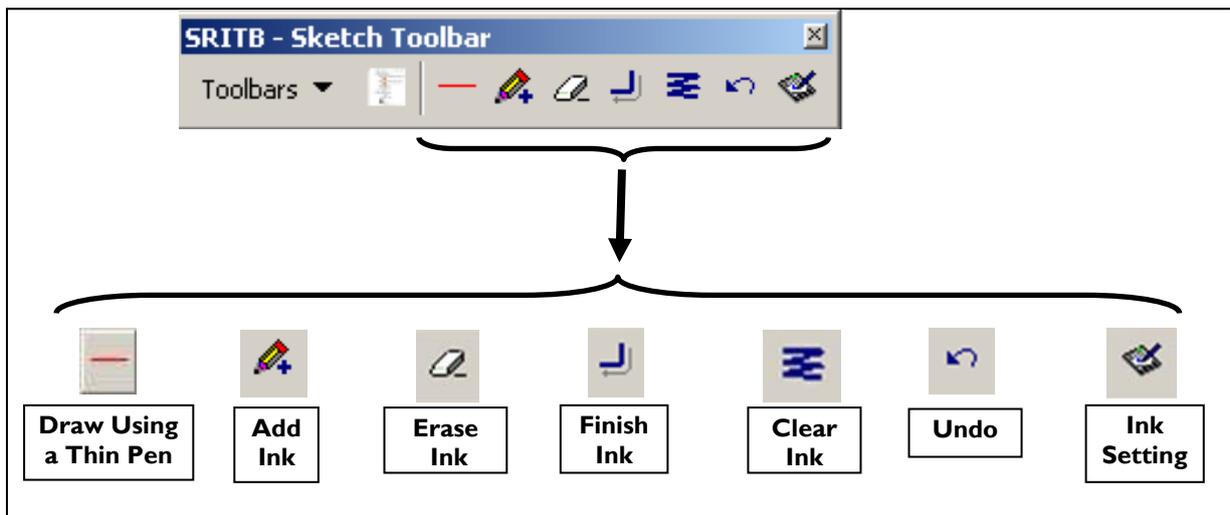
Figure 1.4a. SRITB - Edit Toolbar Icons



SRITB - Sketch Toolbar

The SRITB - Sketch Toolbar contains the most commonly used ESRI Ink tools.

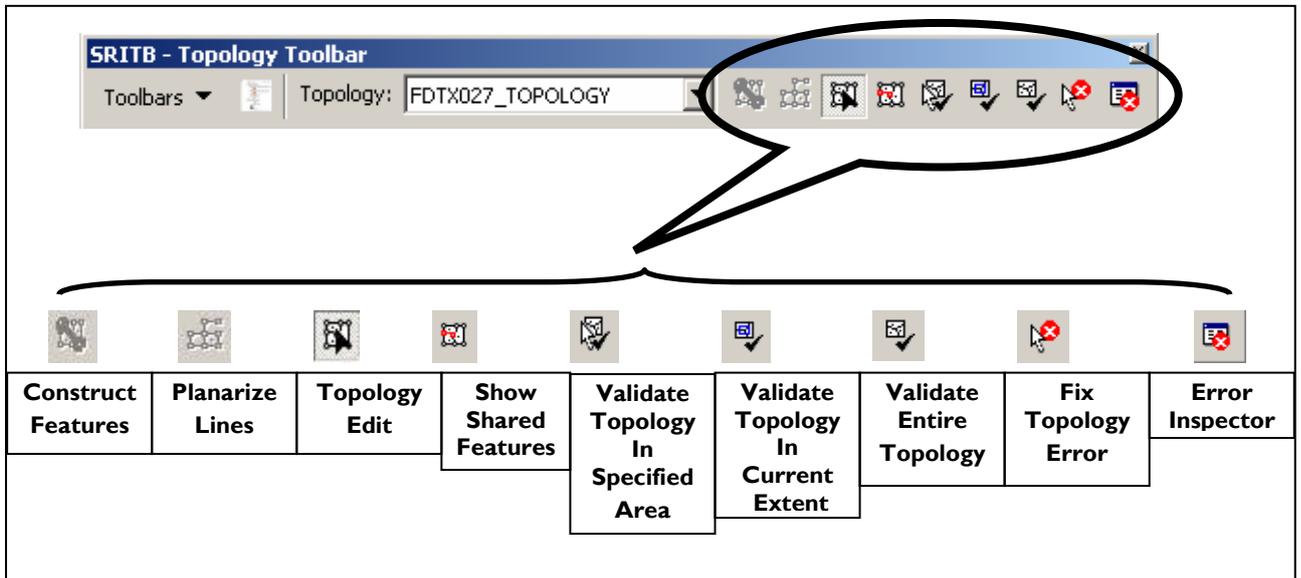
Figure 1.5. SRITB - Sketch Toolbar



SRITB - Topology Toolbar

The SRITB - Topology Toolbar contains the most commonly used ESRI Topology tools.

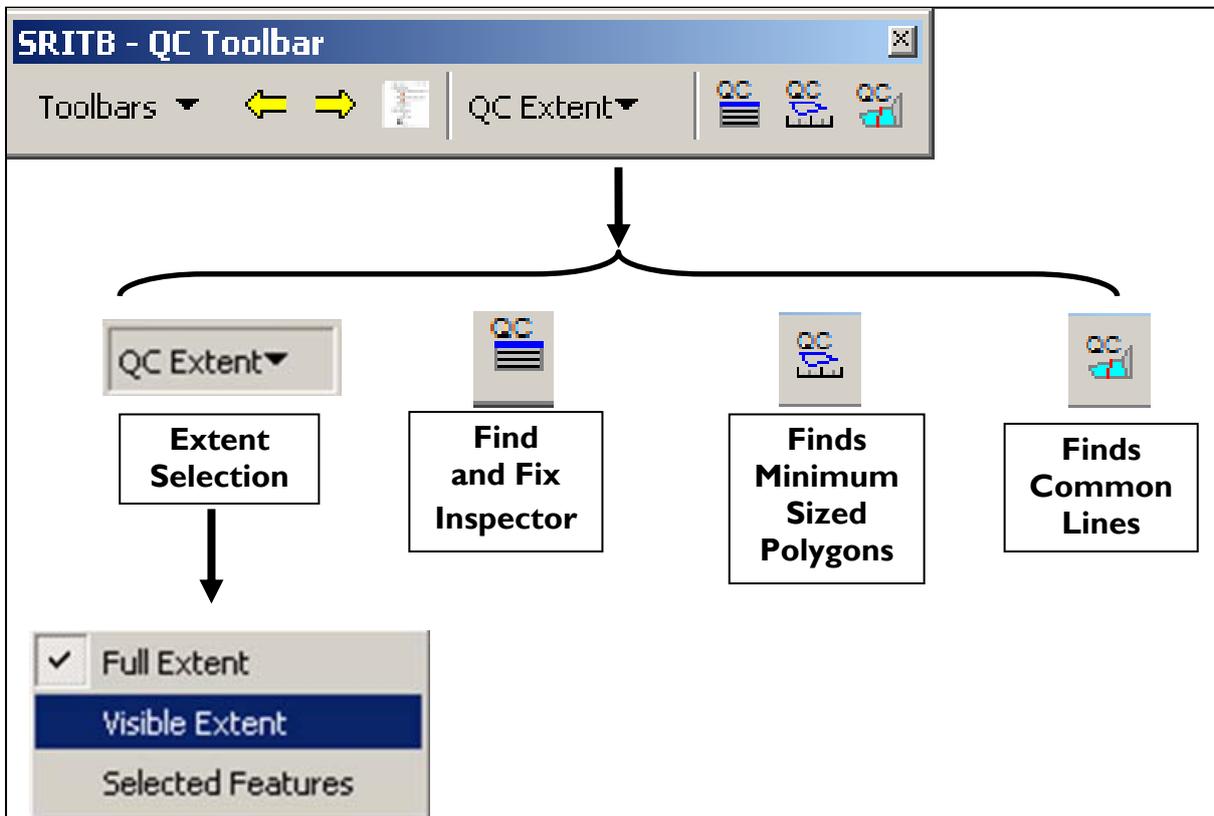
Figure 1.6. SRITB - Topology Toolbar



SRITB – QC Toolbar

The SRITB - QC Toolbar contains quality control tools.

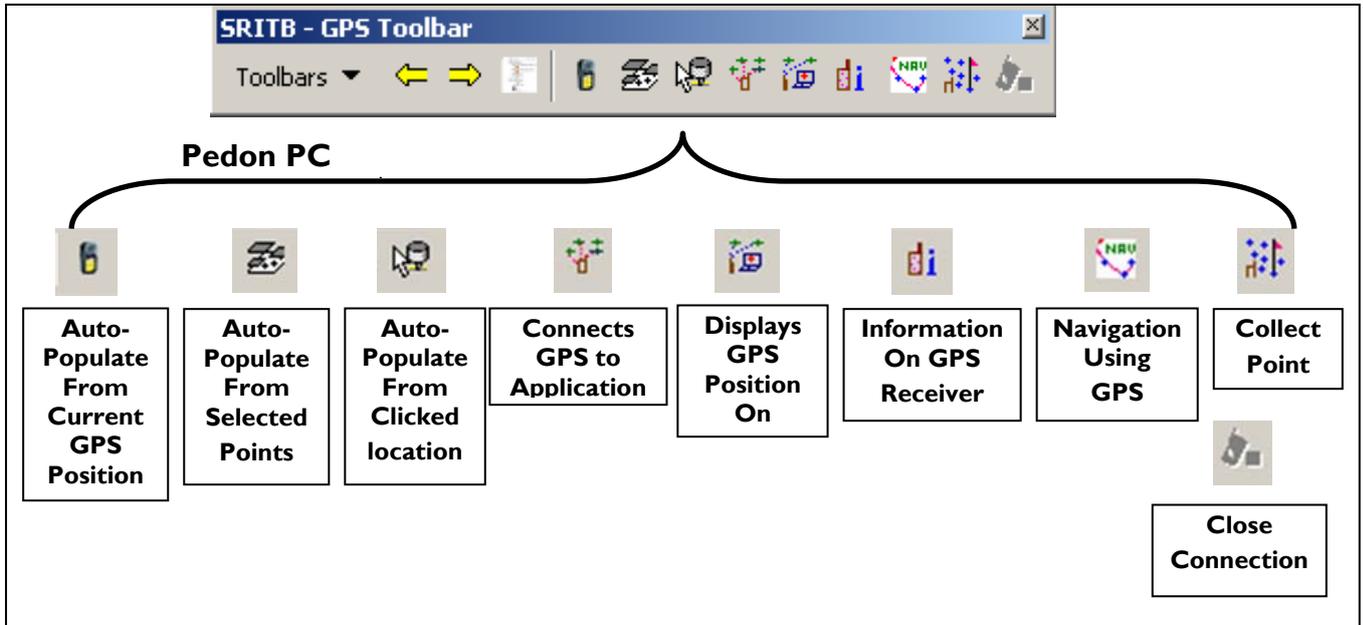
Figure 1.7. SRITB - QC Toolbar



SRITB - GPS Toolbar

The SRITB - GPS Toolbar contains tools designed to help make use of GPS data in the field. The Pedon Autopopulation Tools are located on the GPS Toolbar, as well as tools to navigate with GPS and record an observation point at the current location. See Chapter 4, *GPS Tools*, and Chapter 5, *Pedon Autopopulation Tools*, for more information.

Figure 1.8. SRITB - GPS Toolbar



Chapter 2. Digital Editing Tools

Overview

The custom designed Digital Editing tools are found mainly on the SRITB - Edit Manager and SRITB - Edit Toolbar toolbars. They are designed to save time and reduce the amount of effort required in editing GIS data. If you wish to use these tools on other standard ESRI toolbars, the tools can be found in the `DigitalEditing` category of the ArcMap Customize dialog and drag them to your preferred toolbar.

Editing Environment

The SRITB toolbars contain several controls to help you change the parameters of your editing environment.

Table of Contents Toggle

The Table of Contents Toggle is on each of the SRITB toolbars. It shows and hides the ArcMap table of contents when clicked. Unlike regular menu option (Window->Table of Contents), the current map scale is maintained when the Table of Contents Toggle is used.

Figure 2.1. Table of Contents Toggle



Snapping Environment Toggle

The Snapping Environment Toggle is on the SRITB - Edit Manager toolbar. It shows and hides the ArcMap Editor Snapping Environment Panel when clicked. This tool maintains the current map scale when it is toggled on and off.

Figure 2.2. Snapping Environment Toggle



Snapping Distance

The Snapping Distance quick change panel is accessed from the SRITB - Edit Manager toolbar. You set the ArcMap editor snapping distance on this panel instead of loading the ArcMap Editor Options dialog. Enter the snapping distance on the left and select units of `Pixels` or `Map Units` on the right. The panel will close itself once you move the mouse to another task.

Figure 2.3. Snapping Distance Quick Change Button and Panel



Sticky Move Tolerance

The Sticky Move Tolerance quick change panel is accessed from the SRITB - Edit Manager toolbar. ArcMap editor Sticky Move Tolerance is set on this panel instead of loading the ArcMap Editor Options dialog. The panel closes once the mouse is moved to another task.

Figure 2.4. Sticky Move Tolerance Quick Change Button and Panel



Streaming Tolerance

The Streaming Tolerance quick change panel is accessed from the SRITB - Edit Manager toolbar. ArcMap editor Stream Mode Tolerance is set on this panel instead of loading the ArcMap Editor Options dialog. The panel closes itself once the mouse is moved to another task.

Figure 2.5. Streaming Tolerance Quick Change Button and Panel



Streaming Toggle

The Streaming Toggle button is found on the SRITB - Edit Toolbar. It provides a convenient way to toggle streaming mode on and off. Also, it is a visual indicator showing what mode is currently active. See Figure 2.6, “Streaming Mode Toggle - Streaming Mode Off” and Figure 2.7, “Streaming Mode Toggle - Streaming Mode On” for examples of how the button looks in either state.

Figure 2.6. Streaming Mode Toggle - Streaming Mode Off



Figure 2.7. Streaming Mode Toggle - Streaming Mode On



Custom Tools

The SRITB toolbars contain custom editing tools designed to reduce the number of steps required to complete common GIS editing tasks. If there is an active edit session then all the tools will start a new session before setting the appropriate edit task.

Reshape Edge

Use of the Reshape Edge tool requires an active topology in the ArcMap session. When the button is clicked, it will start an edit session then activate the topology tool, if needed. Click to select the line that needs reshaped. Once the line is selected, the edit task will be reset to Reshape Edge and the sketch tool will be activated. Draw the sketch to reshape the line and double-click to finish.

Figure 2.8. Reshape Edge Button



Modify Edge

Use of the Modify Edge tool requires an active topology in the ArcMap session. When the button is clicked, it will start an edit session. Set edit task to Modify Edge then activate the topology edit tool. This tool can be used to select and modify edges in the dataset.

Figure 2.9. Modify Edge Button



Cut Polygon

The Cut Polygon button will start an edit session and activate the feature selection tool. Click to select the polygon that needs split. The tool will detect your selection and activate the cut polygon edit task, and sketch tool will draw the cut line. Double-click to finish. After the cut is performed, the tool will perform an explode if any of the cut features were multi-part polygons. The default behavior is to show the Edit Attributes window. This behavior can be changed in the preferences dialog by unchecking “Display Attribution Window” after “Cut Polygon”. See more information in the section in Chapter 1. - “Configuration”.

Figure 2.10. Cut Polygon Button



Create Island Polygon

The Create Island Polygon tool will start an edit session and activate the feature selection tool. It also sets the editor snapping properties so that they snap to edit sketch vertices. This allows the creation of an island polygon. Click the feature that contains the island to select it. The tool will set the edit task to cut polygon and activate the sketch tool. This tool can be used to draw the island polygon. Double click to finish the edit sketch and the tool will perform an explode if any multi-part polygons are present. Then the tool will display the edit attributes window if the “Display Attribution Window” after “Cut Polygon” is checked in the preferences dialog. It will reset the snapping properties to what they were before running the tool. If “Continue Cutting” is checked after the “Create Island Polygon” box in the preferences dialog, snapping properties will be reset to what they were before running the tool. See more information in the section in Chapter 1 - “Configuration”.

Figure 2.11. Create Island Polygon Button



Auto Complete Polygon

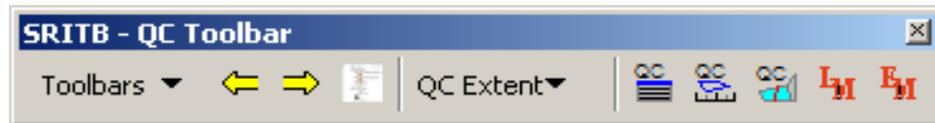
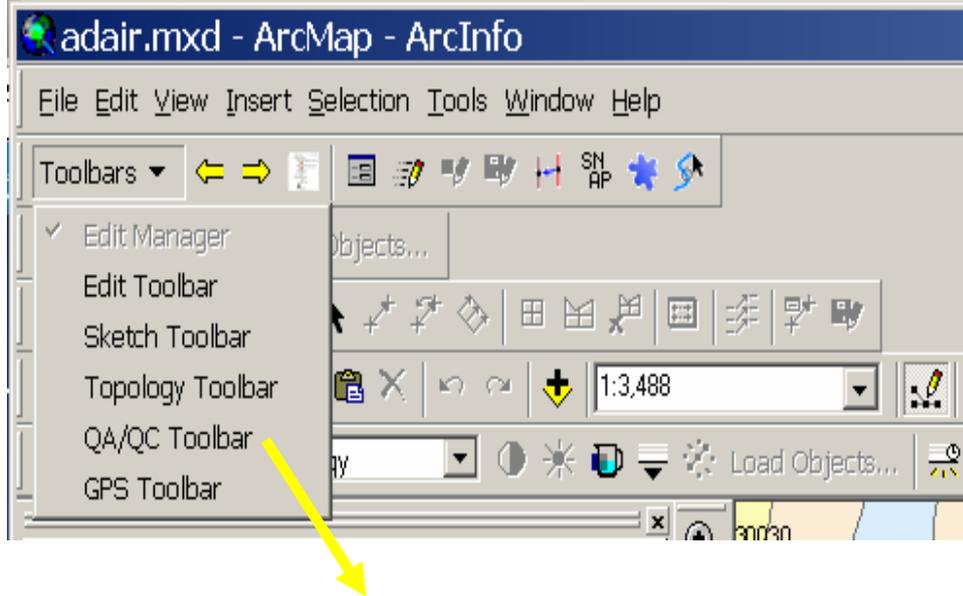
Use of the Auto Complete Polygon tool requires an active topology in the ArcMap session. When clicked, the button will start an edit session and then set edit task to Auto Complete Polygon. This will activate the sketch tool allowing you to add polygons to an existing layer.

Figure 2.12. Auto Complete Polygon Button



Chapter 3. Quality Control (QC) Toolbar

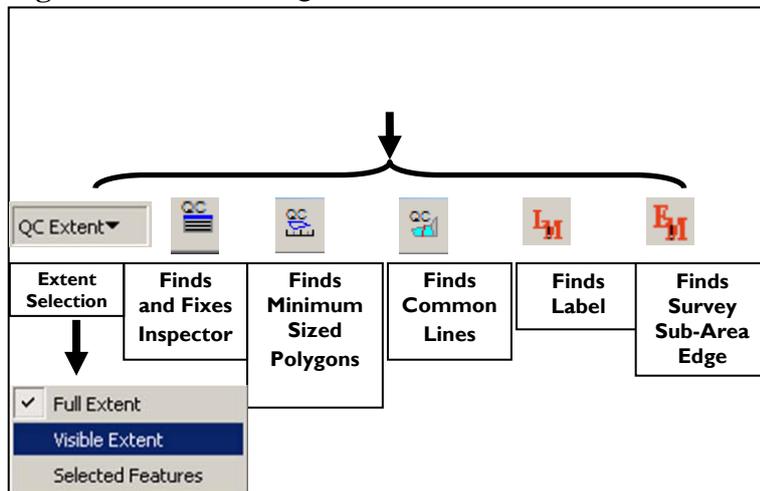
Figure 3.0 Access the QC Toolbar from the SRITB Edit Manager Toolbar



The QC Toolbar contains five tools

- QC Error Inspector (finds and fixes errors)
- Find minimum size polygons
- Find common soil boundaries
- Find label mismatches
- Find edge mismatches

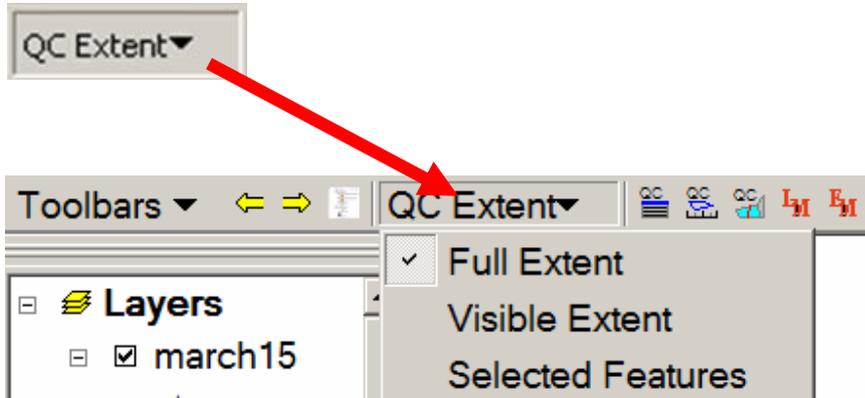
Figure 3.1. SRITB - QC Tools



QC Extent Button

QC Extent can show full extent, visible extent, and selected features. When running a task on a smaller area, use the selected features option rather than visible extent because it runs faster.

Figure 3.2. QC Extent Button



Use: Select extent prior to using any of the QC tools

- Full Extent
- Visible Extent
- Selected Features

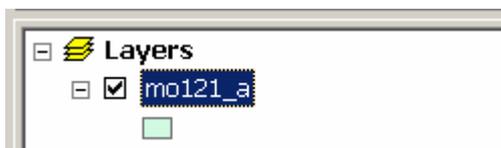
Find Minimum Sized Polygons

Figure 3.3. Minimum Sized Polygons Button



USE: Find small polygons to potentially be merged with adjacent polygons

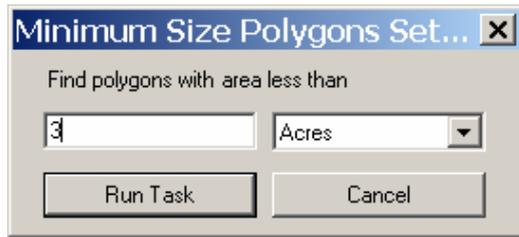
1. Stop Editing Session
2. Left click on soils layer name in the Table of Contents to highlight (may be a geodatabase featureclass or shapefile)



3. Click on the Find Minimum Size polygon task icon on toolbar



- Enter a value for area in either acres or sq. meters (You do not need to have an Acres field in the attribute table.)

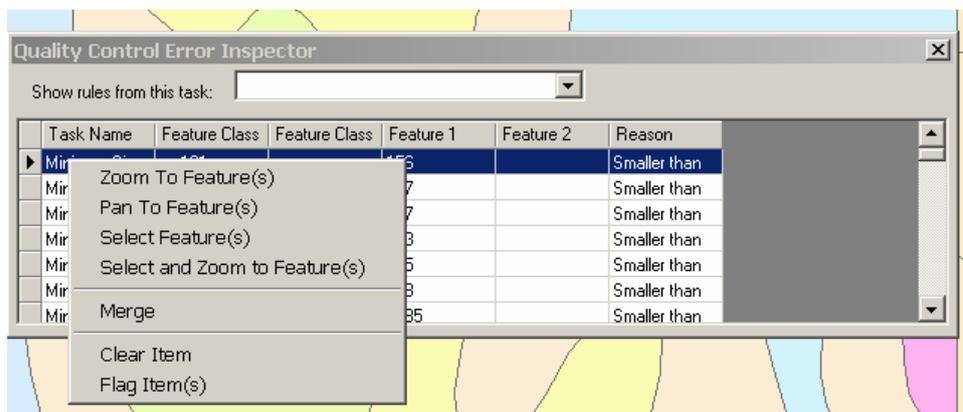


- Run task
- Click on QC error inspector icon to display polygons smaller than specified size

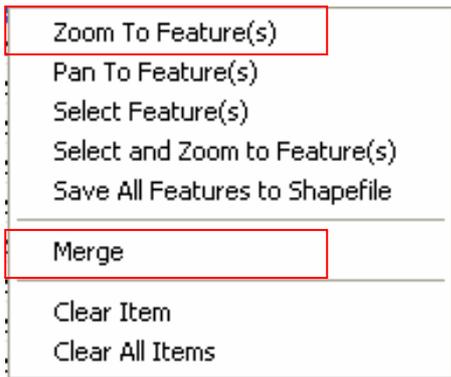


Task Name	Feature Class	Feature Class	Feature 1	Feature 2	Reason
Minimum Siz	mo121_a		156		Smaller than
Minimum Siz	mo121_a		177		Smaller than
Minimum Siz	mo121_a		497		Smaller than
Minimum Siz	mo121_a		583		Smaller than
Minimum Siz	mo121_a		705		Smaller than
Minimum Siz	mo121_a		828		Smaller than
Minimum Siz	mo121_a		1085		Smaller than

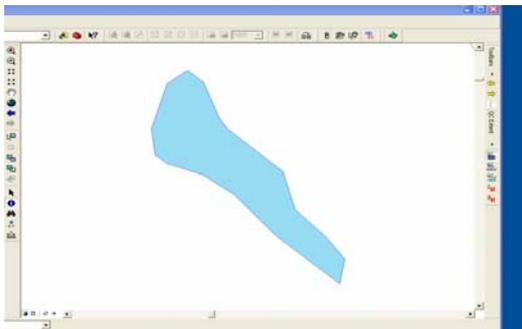
- Left click on a row in the table to select a feature



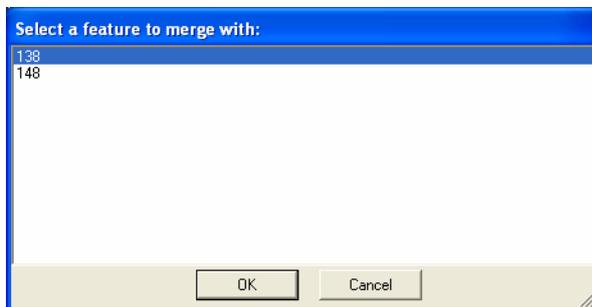
- Right click on the selected row to display options
- Select and zoom to a feature using one of the zoom/select options



10. Select Merge to merge selected small polygon with an adjacent polygon if needed.
11. If the selected polygon is an “island” polygon, it is merged with the surrounding polygon.



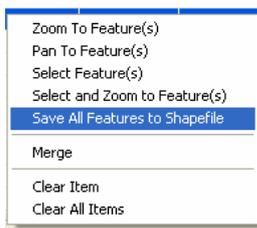
12. If the selected polygon is bordered by multiple polygons, an attribute box will appear:



- a) Click on the Object ID in the left pane and the associated polygon will Flash on the screen. Click OK.
- b) Select the polygon that has the desired attributes to retain

If you do not have time to deal with all of the errors in one session, you may save all of the features to a shapefile for future reference.

1. Right click on any record in the QC error inspector table
2. Select Save All Features to Shapefile



3. Navigate to output location and give the new shapefile a name
4. Save all features to a shapefile. The new shapefile is automatically added to the map document.

TIP: Once you have finished using one of the QC tools, you should clear all records from the table before running another quality control task.



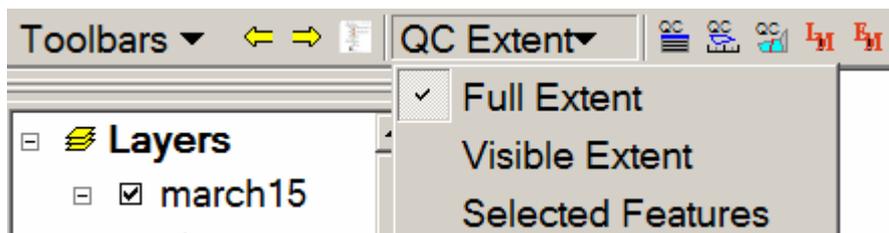
If you do not clear the records, they are carried over from one task to another. The records are cleared out of the table when you quit. The results from multiple tools can cause confusion so it is best to clear the tables after each tool is used.

Find Common Soil Boundaries

Figure 3.4. Find Common Soil Boundaries Button



1. Stop Editing
2. Select extent for task
 - Full Extent
 - Visible Extent
 - Selected Features



When running a task on a smaller area, use the selected features option rather than visible extent. It runs much faster!

- Left click on soils layer name in the Table of Contents to highlight



- Choose the common soil line task icon on toolbar



- Wait for message box to appear when task is complete. *Click OK



- Process uses a lot of resources. Avoid running other processes at the same time

* Note that features will appear in the error inspector as they are found. Wait until the process is completely finished to avoid processing errors

- Click on QC error inspector icon to display polygons with common soil boundaries



A screenshot of the 'Quality Control Error Inspector' window. The window has a blue title bar and a close button. Below the title bar is a dropdown menu labeled 'Show rules from this task:'. Below the dropdown is a table with the following data:

Task Name	Feature Class	Feature Class	Feature 1	Feature 2	Reason
Common Soil	mo001_a	mo001_a	1470	1421	Polygons both have MUSYM: 50001
Common Soil	mo001_a	mo001_a	1365	1421	Polygons both have MUSYM: 50001
Common Soil	mo001_a	mo001_a	1396	1421	Polygons both have MUSYM: 50001
Common Soil	mo001_a	mo001_a	1434	1421	Polygons both have MUSYM: 50001
Common Soil	mo001_a	mo001_a	1458	1421	Polygons both have MUSYM: 50001
Common Soil	mo001_a	mo001_a	3525	15519	Polygons both have MUSYM: 60201
Minimum Siz	mo001_a		641		Smaller than 1 acre

- Left click on a row in the table to select a feature

9. Right click on the selected row to display options



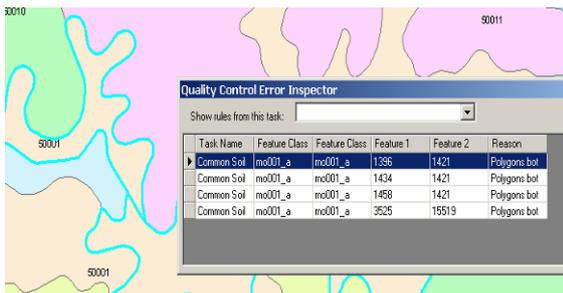
10. Select and zoom to a feature using one of the zoom/select options

11. Two Edit Options:

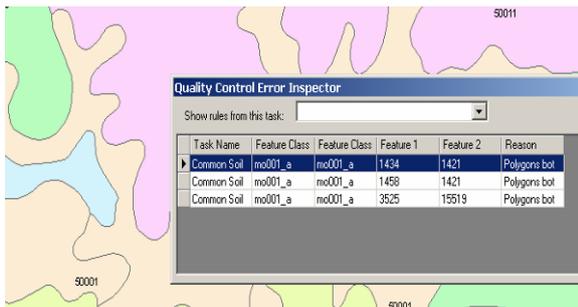
- Select Merge to merge adjacent polygons if needed
- Select Edit Attributes to change an attribute if needed

12. Merge feature

- When selected, both polygons sharing a common boundary are highlighted

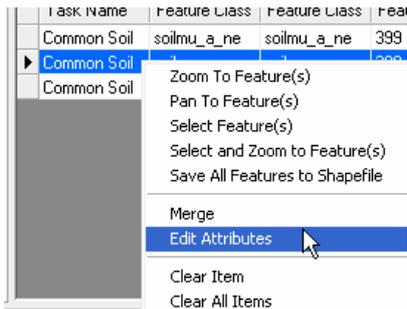


- After merging, one polygon remains and the record is cleared from table



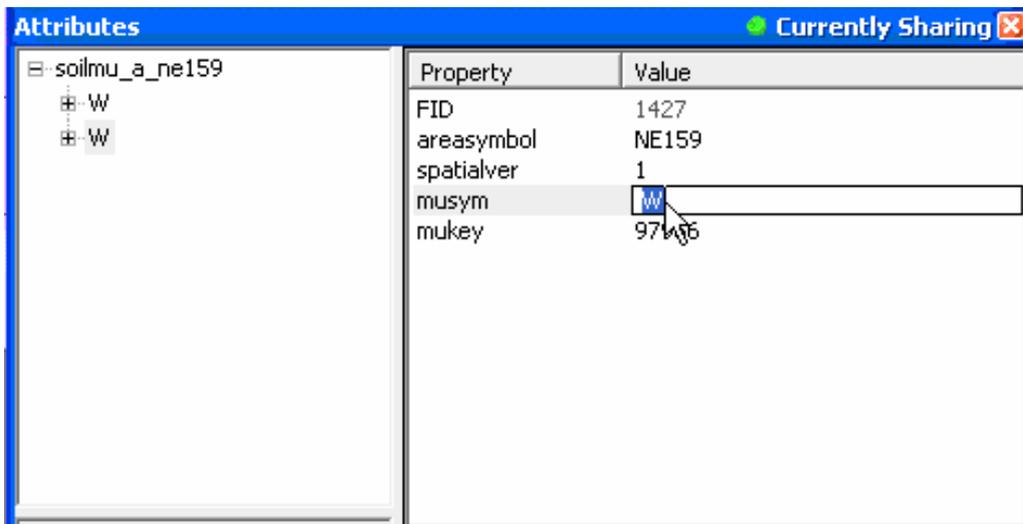
13. Edit Attributes feature

- Attributes window opens allowing user to edit attribute of each selected polygon



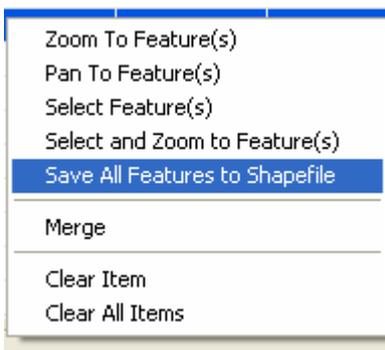
14. Click on polygon attribute in left pane and the polygon will flash

15. Change the attribute in right pane



16. (Optional) Copy text from find minimum size polygons task. Export out All of the Errors to a Featureclass or shapefile.

- Right click on any record in the error inspector table
- Select Save All Features to Shapefile



17. Navigate to output location and give the new shapefile a name

18. Save Edits. Edits are not automatically saved when using the error inspector.

19. Clear all records from the table before running another quality control task (Rt. Click > Clear All Items).

Zoom To Feature(s)
 Pan To Feature(s)
 Select Feature(s)
 Select and Zoom to Feature(s)
 Save All Features to Shapefile

Merge
 Edit Attributes

Clear Item
 Clear All Items

Find Label Mismatches

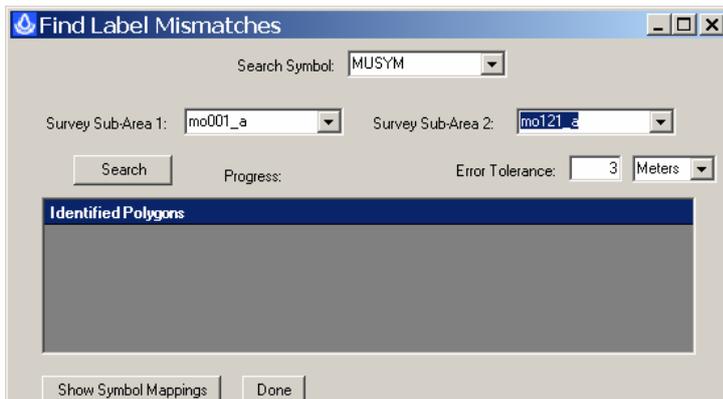
Figure 3.5. Find Label Mismatches Button



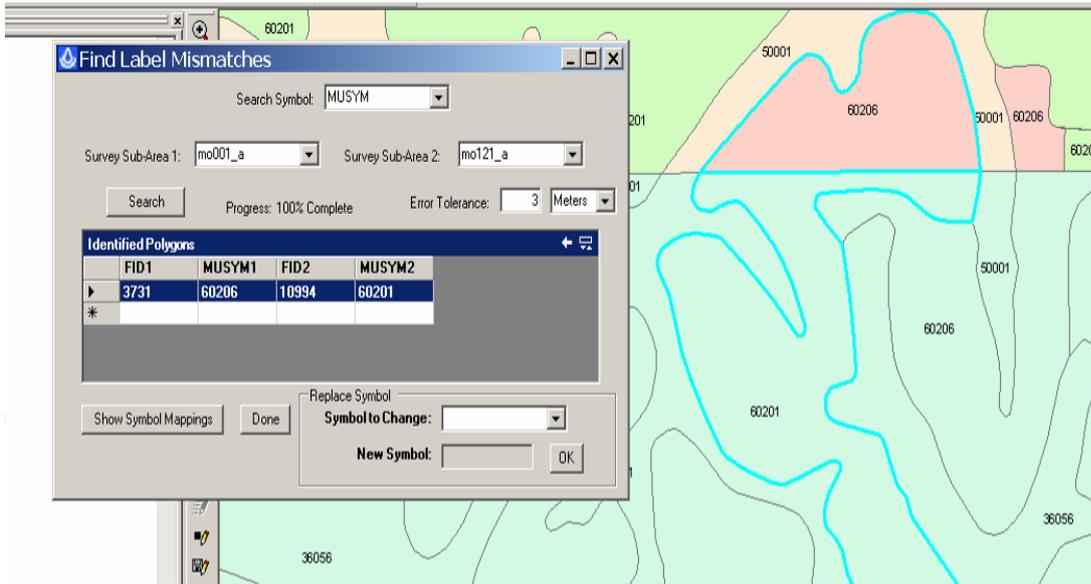
1. Add adjacent shapefiles or feature classes to map
2. Click LM task icon on toolbar



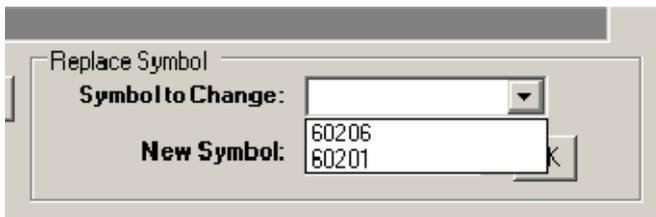
3. Select: Search symbol, Survey Sub-Areas, and Error Tolerance from drop downs
4. Click Search button



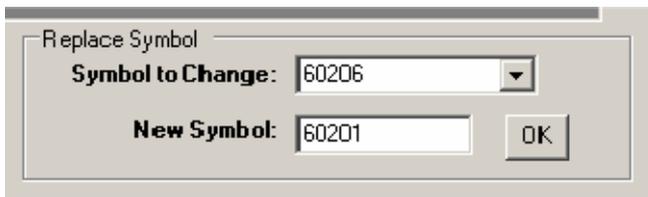
5. Left click on a row of identified polygons to zoom to and select
6. Right click on row to open Replace Symbol options



7. Select symbol to change from drop-down list



8. Enter New Symbol, click OK



9. Change is saved automatically, no undo!

10. Run label mismatch task again after editing labels

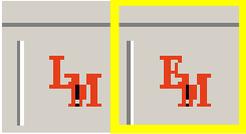
11. Switch Sub-Area 1 and Sub-Area 2 to ensure all label mismatches are found

Find Survey Sub-Area Edge Mismatches

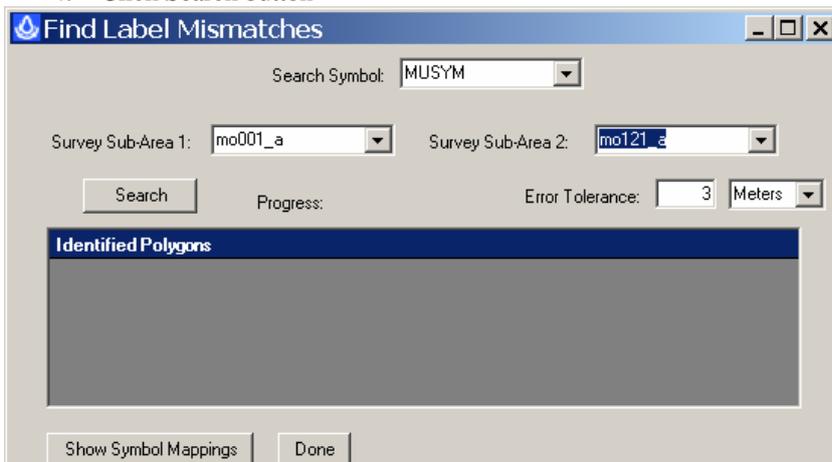
Figure 3.6. Find Survey Sub-Area Edge Matches Button



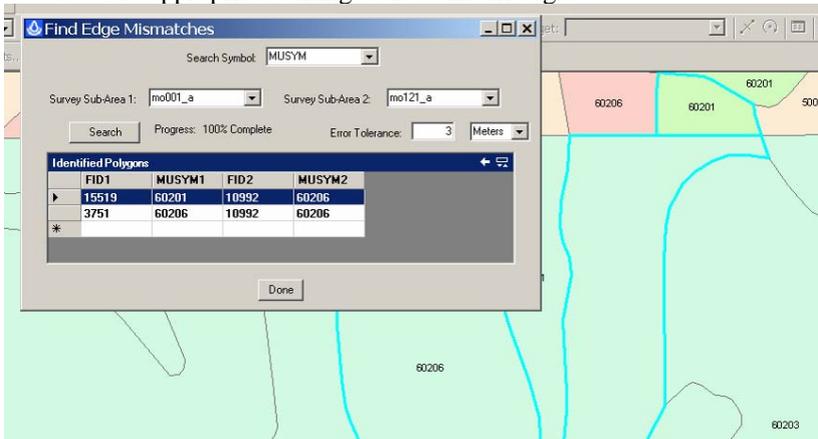
1. Add adjacent shapefiles or feature classes to map
2. Click EM task icon on toolbar



3. Select: Search symbol, Survey Sub-Areas, and Error Tolerance from drop downs
4. Click Search button



5. Left click on identified polygons to zoom to and select
6. Use appropriate editing tools to match edges



7. Run edge mismatch task again after editing polygons
8. Switch Sub-Area 1 and Sub-Area 2 to ensure all edge mismatches are found

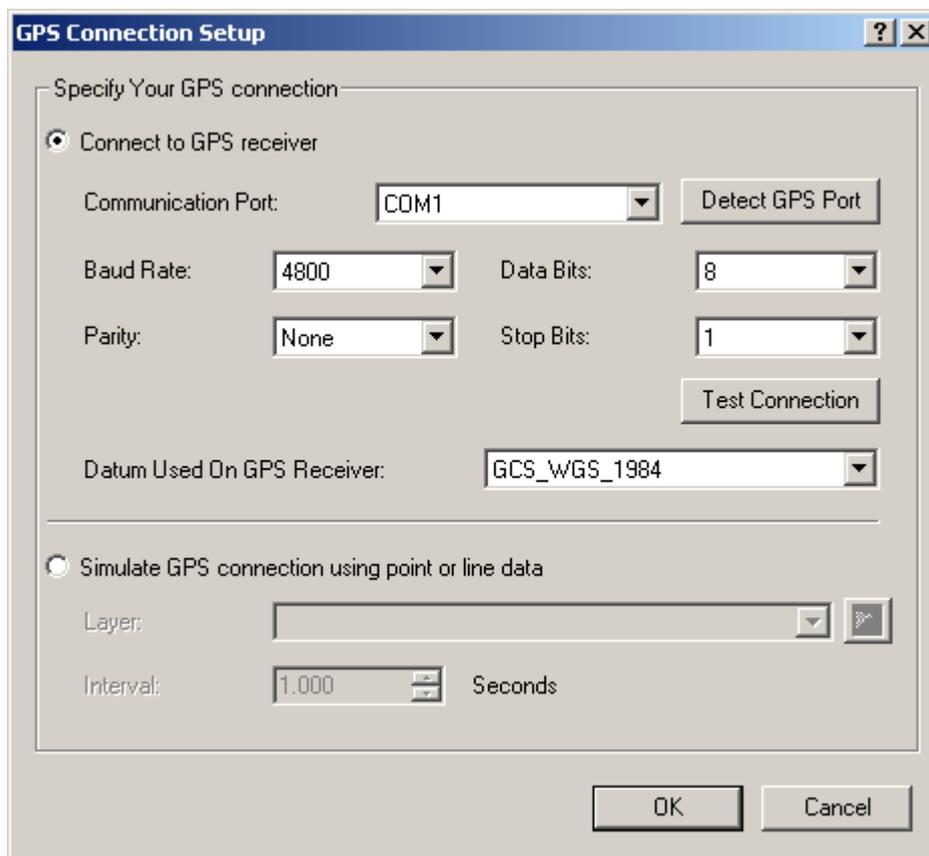
Chapter 4. GPS Tools

GPS Connection Parameters

This button brings up the ArcMap GPS Connection Setup screen. Use “Detect GPS Port” button and “Test Connection”. If both of these buttons are successful, click OK to close the dialog. If one or both fails, manually select connection parameters until the “Test Connection” button is successful.

A communication port of COM3 and Baud Rate of 4800 is common for some built in GPS receivers. The com ports that ArcGIS selects will generally range from 1 to 9. Typically ArcGIS will choose the same port over and over again on a particular computer.

Figure 4.1. GPS Connection Parameters Button and Dialog



Activate GPS

If the GPS is connected and the connection parameters are properly set (see the section called “GPS Connection Parameters”), click this button to activate the GPS and display the current location on the map.

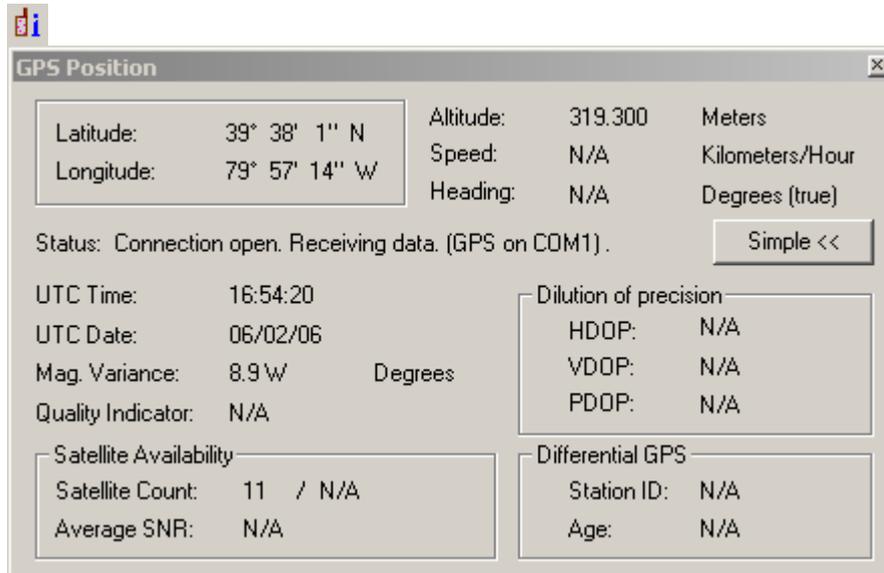
Figure 4.2. Activate GPS Button



Display GPS Info

This button brings up a panel showing detailed information coming directly from the GPS.

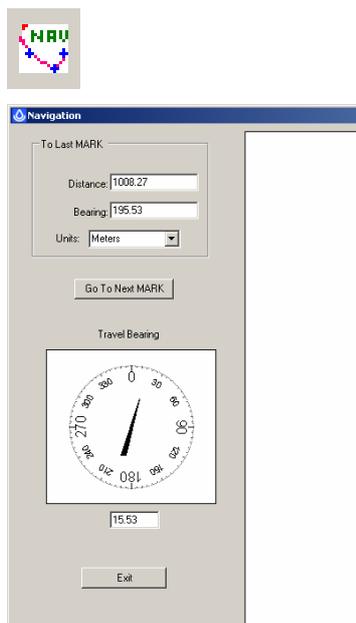
Figure 4.3. Display GPS Info Button and Info Panel



Navigate Using GPS

This tool brings up a window to show the current map. To navigate to a specific place on the map, click on the map to place a MARK. The window will show the distance and the bearing to the mark from the current GPS location, as well as a compass showing the direction of travel. Click "Go To Next MARK" to clear the mark from the map to place another MARK.

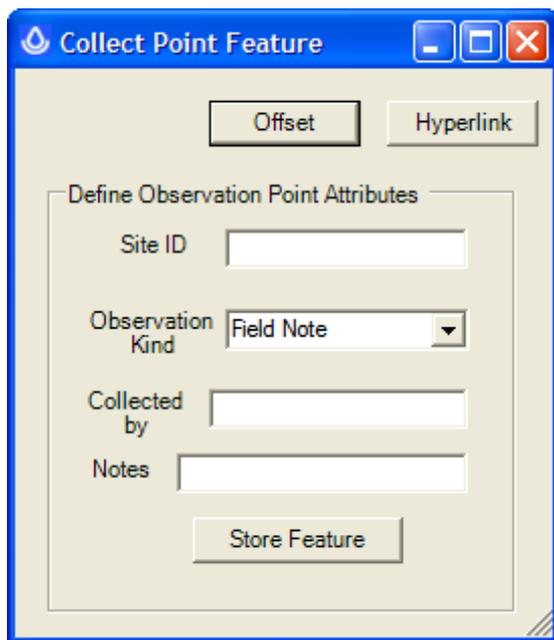
Figure 4.4. GPS Navigation Tool Button and Window



Collect a GPS Observation Point

This tool creates a new point feature using the current GPS location. The point is stored in the first layer in the ArcMap session with `_op` in the layer name. Click the Offset button to enter a distance and bearing to offset the current location. Click the Hyperlink button to link the new point to an external file (picture, video, sound, etc...) with ArcMap's hyperlink tool. After entering the point's information, click Store Feature to save it.

Figure 4.5. Collect GPS Observation Point Button and Dialog



Collect Point Feature

Offset Hyperlink

Define Observation Point Attributes

Site ID

Observation Kind

Collected by

Notes

Store Feature

Chapter 5. Pedon Autopopulation Tools

Introduction

The Pedon Autopopulation Tools are designed to automatically fill out location and site data using geospatial layers. It also integrates with a GPS if one is available. A user can specify a location or a group of points in ArcMap. The location is intersected with various data layers on the user's computer to gather data to insert into the pedon database.

Setup

In order to use the Autopopulation Tools, the following software needs to be installed:

- Microsoft Access 2003
- Pedon PC

The Autopopulation Tools can be found on the Pedon Autopopulation Toolbar or the SRITB - GPS Toolbar. Autopopulation uses specifically named layers in the ArcMap document to gather data. The following table list layer names and attribute fields currently used. If any of these layers do not exist, the Autopopulation Tools will not be able to populate the corresponding items in the pedon database.

Table 5.1. Pedon Autopopulation Data Layers

Pedon Field	Layer Name	Attribute Field Name
Area Overlap - Non MLRA SSA	soilmu_a	areasybol
Area Overlap - State	county_dm_a	STATE_FIPS
Area Overlap - County	county_dm_a	COUNTY_NAM
Area Overlap - 7.5 Min Quadrangle	quads24K	QUADNAME
Area Overlap - MLRA	mlra	MLRA_NAME

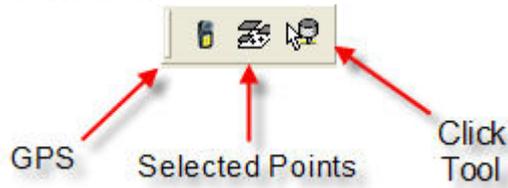
When creating new pedons, the Autopopulation Tools will create a new point in your spatial data as well as the new Pedon database records. This spatial point will be created in a layer with `_dp` in the name. It will have the new pedon's user pedon ID recorded in an attribute field named `user_pedon_id`. The user site ID is recorded as `user_site_id` if those fields exist. If this layer does not exist, no spatial record will be created, but new pedon's coordinates will still be recorded in the pedon database.

Usage

There are two modes of operation: Create New Pedon and Update Existing Pedon. Either mode requires the user to specify a user pedon ID. In new mode, the pedon will be created if there is no existing upedonid matching the user-supplied one and displaying an error message if it already exists. Update mode is exactly the reverse. It will autopopulate existing pedons and display an error message if the supplied upedonid cannot be found in the pedon database.

Pedon PC Autopopulation has three interface modes. GPS mode will use the current GPS position to autopopulate. Selected Points mode autopopulates multiple pedons at once using a selected set of points from ArcMap. The third method is an ArcMap tool allowing the user to click on the map to autopopulate at the

clicked coordinates.



GPS Mode

In this mode, a connection must first be established to the GPS. Load the GPS toolbar in ArcMap. Open the GPS Connection Setup menu and use the Detect GPS Port button followed by the Test Connection button. If the connection test fails, modify the settings using the dropdown menus until it succeeds. Click the Open Connection button on the GPS toolbar.

To start the autopopulation with the GPS, click the Autopopulate from GPS icon in the Pedon Autopopulation Toolbar. It will prompt you for a user pedon ID and user site ID. Leaving the user site ID field unchanged or blank will result in the user pedon ID being used for the user site ID as well.

This method creates a point, there should be a layer in the ArcMap document with the text `_dp` in its name and attribute fields named `user_pedon_id` and `user_site_id`. The user pedon ID supplied will be written to the new point's `user_pedon_id` field, and the user site ID written to `user_site_id`. The tool will write the latitude/longitude and UTM data. If there are any of the layers found in Table 4.1 "Pedon Autopopulation Data Layers," that data will be written to the area overlap table.

After it is finished writing, the data tool will launch Pedon PC to allow the entering of a description for the new pedon.

Selected Points Mode

This method is useful for populating a large group of points. Waypoints can be downloaded from the GPS into ArcMap using DNRGarmin and then pedons can be created from a selected set of them. To use the tool, select one or more points from any data layer in ArcMap. This function will not add the points to the documentation points layer, but that will be an option in the future. This tool scrolls through the attribute fields of the selected points and displays a dropdown menu listing them. Select a field containing text to use as user site IDs for the new pedons. The tool will write the same data items as described in the GPS Method section and start Pedon PC.

Click Tool Mode

Choose the click tool. Click a location on the map to create a point.

This method creates a point. There should always be a layer in the ArcMap document with the text `_dp` in its name and attribute fields named `user_pedon_id` and `user_site_id`. The user pedon ID supplied will be written to the new point's `user_pedon_id` field, and the user site ID written to `user_site_id`. The tool will write the latitude/longitude and UTM data. If there are any of the layers found in Table 4.1 "Pedon Autopopulation Data Layers," that data will be written to the area overlap table.

After it is finished writing data, the tool will launch Pedon PC to allow the user to enter a description for the new pedon.

Chapter 6. 3D Data View

Introduction

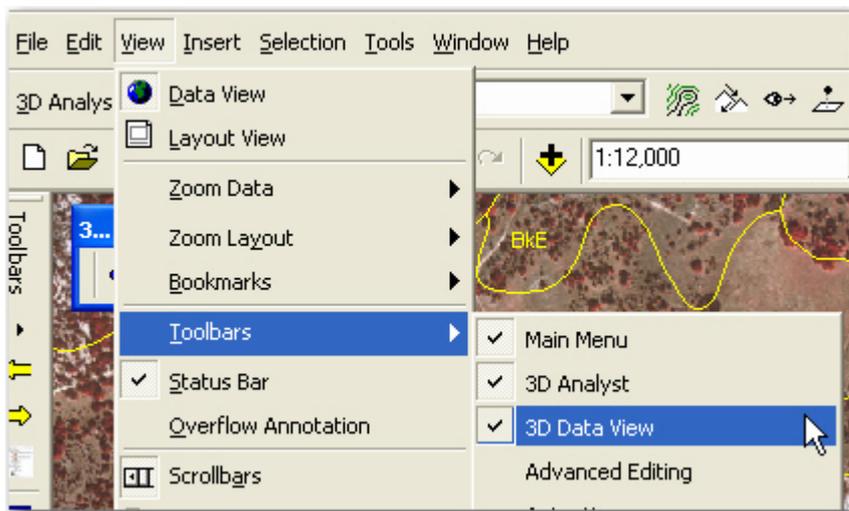
The 3D Data View tool is designed to clip layers in ArcMap and send them to ArcScene.

Setup

In order to use the 3D Data View Tool, the Soil Resource Inventory Toolbox Extension for ArcGIS 9.2 version 1.1.18 must be installed:

To add the “3D Data View toolbar to Arc Map, choose View > Toolbars and check the 3D Data View choice.

Figure 6.1. Select the “3D Data View” toolbar



Use of the 3D Data View Tool

This example presents the application of this tool in an ArcMap session with elevation survey points, soil map unit polygons, DOQ image, 10m NED ESRI Grid.

Soil map units are symbolized with hollow fill and yellow outlines.

Figure 6.2. Adjust the display to the area of interest to be displayed in ArcScene

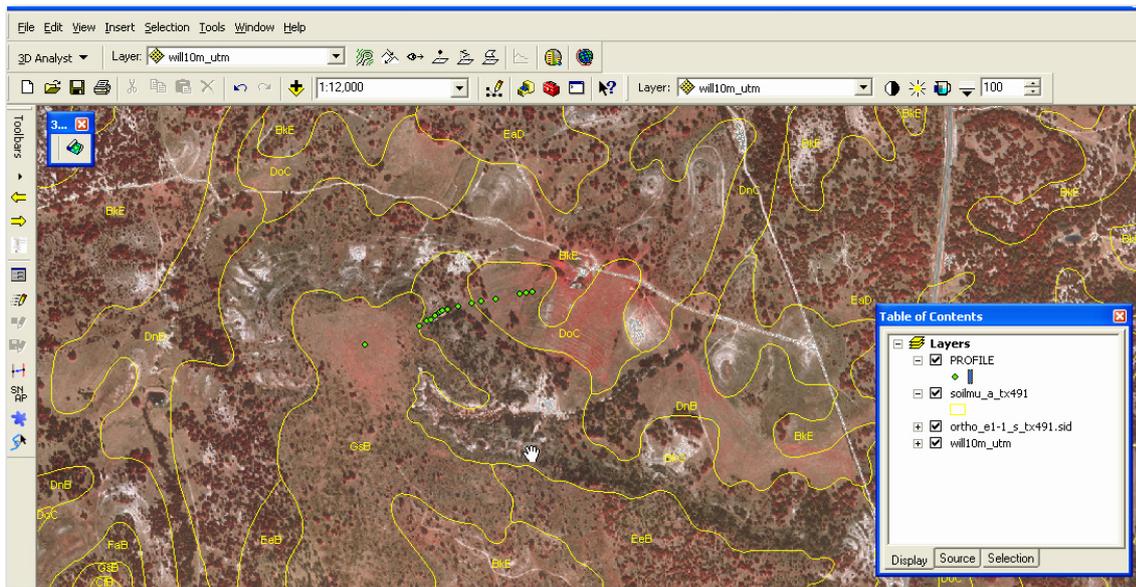
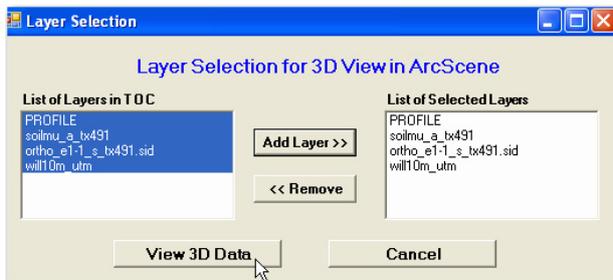


Figure 6.3. Choose the 3D Data View tool.



Figure 6.4. Select the layers to be displayed in the 3D Data View.



One at a time, select the layers from the list of layers in the TOC (table of contents) and click the “Add Layer >>” button, or hold the shift key down to select more than one layer to add at one time.

Once the layers have been selected, click on the “View 3D Data” button.

Arc Scene will automatically activate.

The layers will be added with the existing symbology present in ArcMap.

The elevation layer will automatically be turned off.

The image layer will automatically be set to rendering level of 10.

Figure 6.5. This is an example of an image ported to ArcScene via the “3D Data View” Tool.

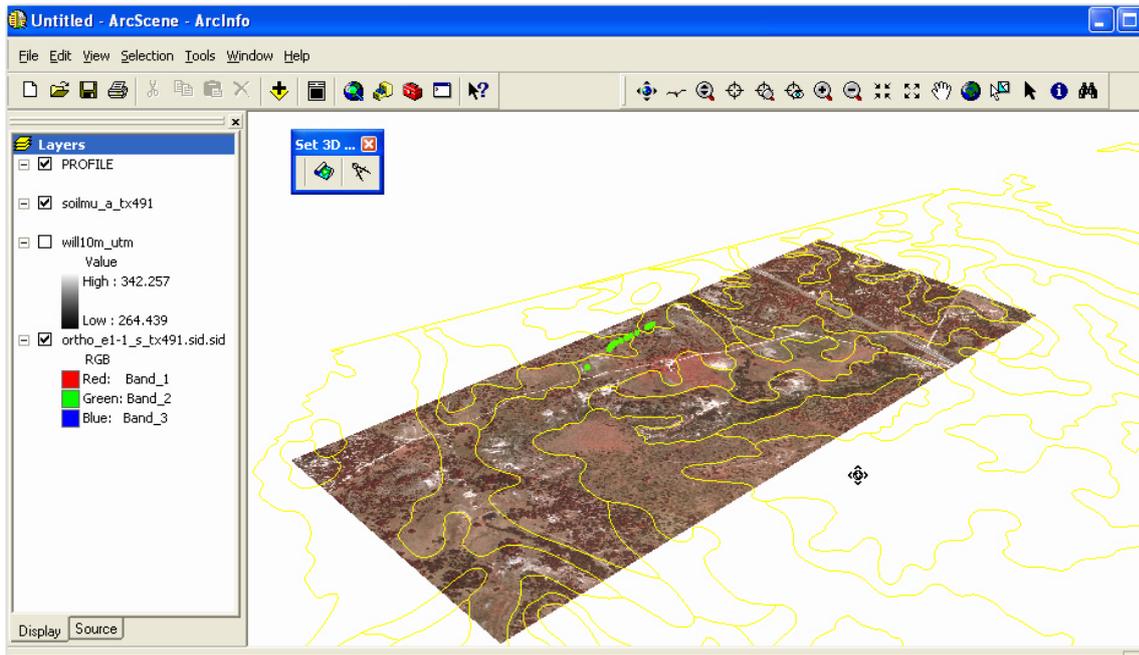
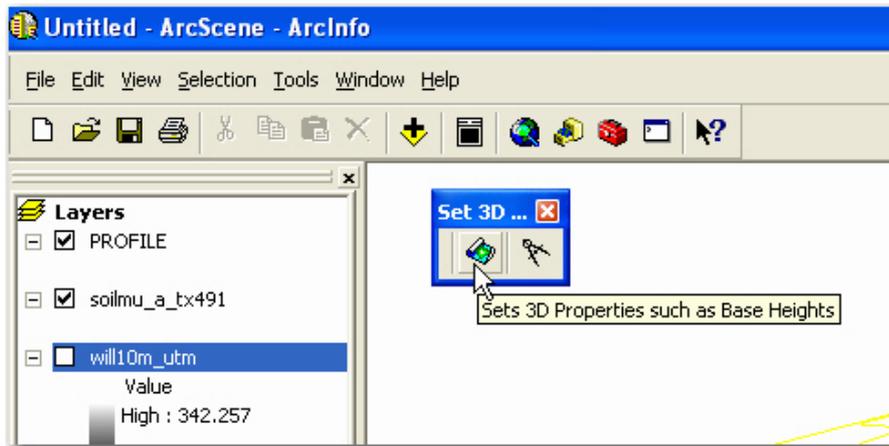


Figure 6.6. Set the base height



To set the base height, the elevation layer must be selected first by highlighting it. Then, click on the button that sets the 3D properties. This process can take a minute or two depending upon the size and complexity of the layer.

Figure 6.7. Results of the base height being set

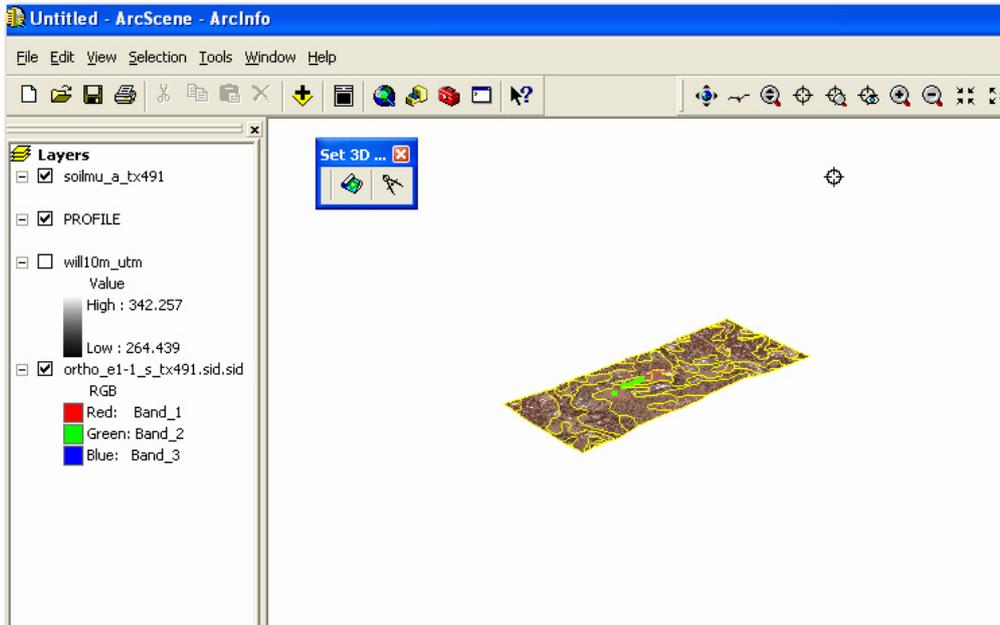
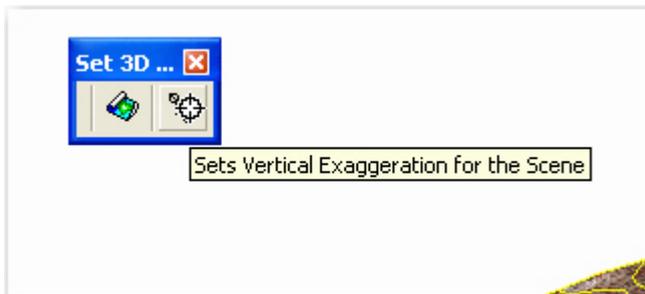


Figure 6.8. The next step is to set the Vertical Exaggeration.



The button on the right sets the vertical exaggeration.

Figure 6.9. Choose the Vertical Exaggeration from the drop down menu.

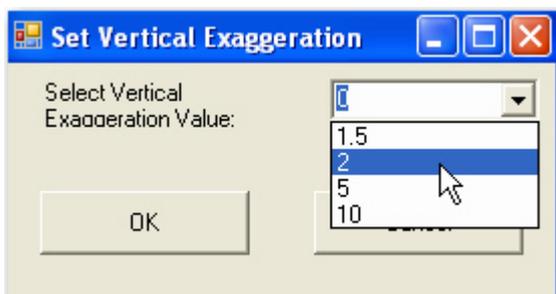
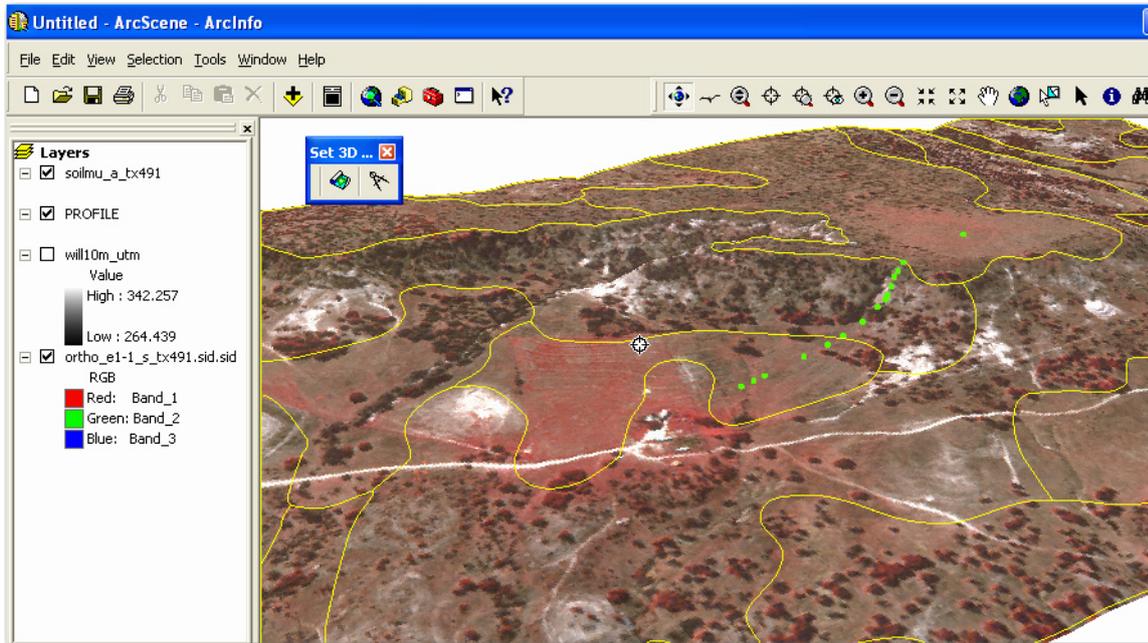


Figure 6.10. Zoom in or fly into the scene to view features and imagery draped on the elevation surface.



When completed with 3D view, close ArcScene application without saving the document. This automatically deletes all files created except the clipped elevation data. When the tool is activated in ArcMap again, this temporary elevation data stored in the C:\temp\Launch3DView folder will be deleted.

Chapter 7. ND83 – WG84 Buttons

Introduction

The Convert2Nad83 Tool looks at the Microsoft Access pedon.mdb site table for lat/long, datum and UTM values. It then converts Nad1927 values to the NAD1983 datum and outputs lat/long decimal degree values in the SiteNad83 Pedon PC database table. Rows that cannot be converted are reported in a text document – “incompletesiteids.txt”.

Figure 7.1. Pedon Autopopulation Toolbar with ND83 and WG84 Buttons



Usage

The steps to use the Convert2Nad83 Tool are as follows:

1. Open ESRI ArcMap application.
2. Go to the Tools menu and click on Customize option.
3. Check the Pedon Autopopulation Toolbar if it is not already checked.
4. Click the  icon on the toolbar.

Unless the SiteNad83 table is already full, there will be a progress bar on the bottom left corner of the ArcMap window. After the progress bar hits 100%, there will be a confirmation message, “Nad83 Transfer/Conversion complete”.

Program Functionality

The SiteNad83 and SiteWGS84 output tables have four fields: siteid, Latitude, Longitude and description. The siteid field is the imported site table primary key field. The Latitude and Longitude fields are the lat/long values displayed in decimal degrees. The description field contains a code from 0 to 5 indicating the conversion type.

Documentation of the codes generated to populate the incompleteSiteIDs report that results from running the Convert2Nad83 Tool are as follows:

Code 0

If the site table record has lat/long values and a datum value equal to Nad83, then the code “0” is returned in the SiteNad83 table description field. This code reflects no conversion performed.

Code 1

If the site table record has lat/long values and a datum value not equal to Nad83 (it is Nad27), then the data is converted to Nad83. The code “1” is returned in the SiteNad83 table description field.

Code 2

If the site table datum field is empty or one of the lat/long values is empty, then the UTM values (UTM Zone, UTM Northing and UTM Easting) are checked. If the UTM values are available, then they are used to do the conversion. The code “2” is returned in the SiteNad83 table description field.

Code 3

If the site table datum and UTM Zone fields are empty, then the lat/long values are checked. If the lat/long values are available, then they are used to calculate the UTM Zone. If the UTM Easting and Northing values are also available, then they are used to do the conversion. The code “3” is returned in the SiteNad83 table description field.

Code 4 and Code 5

If only the lat/long values are available, then the datum is calculated using the site obs table site observation date field. If the year designation is greater than or equal to “1983” then Nad83 is assumed, otherwise Nad27 is assumed. The code “4” is returned in the SiteNad83 table description field if Nad83 is assumed. The code “5” is returned in the SiteNad83 table description field if Nad27 is assumed.

If there was insufficient information available for the conversion, a text file with the default name “incompleteSiteIDs” is generated and the codes listed above are included in the report.

Sample Tables

Shown below are the site and site observation tables in the pedon.mdb database and the Site Nad 83 table in the pedon_pc.mdb database.

Table 6.1. Site Table

Rec ID	User Site ID	Lat. Degrees	Lat. Minutes	Lat. Seconds	Lat. Direction	Long. Degrees	Long. Minutes	Long. Seconds	Long. Direction	Datum Name
1	99MT6460102	46	19	14.3656	1	114	1	56.20321	2	2
2	00MT6380089	46	56	17.91312	1	114	5	39.99586	2	2
3	00MT6380096	46	56	48.83532	1	114	1	1.086064	2	2
4	00MT6380095	46	55	33.2849	1	114	1	38.57866	2	2
5	00MT6380093	46	55	7.187901	1	114	1	49.19694	2	2
6	00MT6380094	46	55	16.76597	1	114	1	47.48493	2	2
7	00MT6380092	46	56	58.91734	1	114	6	47.32352	2	2
8	00MT6380091	46	56	47.83355	1	114	6	30.51019	2	2
9	00MT6380090	46	56	40.4878	1	114	6	14.20658	2	2

Table 6.2. Site Observation Table

Migrated Site Rec ID	Observation Date
1	9/14/1999
2	6/8/2000
3	6/15/2000
4	6/15/2000
5	6/15/2000
6	6/15/2000
7	6/8/2000
8	6/8/2000
9	6/8/2000

Table 6.3. Site NAD-83 Table

siteid	Latitude	Longitude	description
1	46.3206571111111	-114.032278669444	0
2	46.9383092	-114.094443294444	0
3	46.9468987	-114.016968351111	0
4	46.9259124722222	-114.027382961111	0
5	46.9186633058333	-114.030332483333	0
6	46.9213238805556	-114.029856925	0
7	46.9496992611111	-114.113145422222	0
8	46.9466204305556	-114.108475052778	0
9	46.9445799444444	-114.103946272222	0

WG84 Button

The WG84 button works similar to the ND83 button. It is provided for regions of the globe outside of North America for which WGS84 is a more appropriate datum to use.

