Soil Resource Inventory Tool Box (SRITB)

Southern Regional Cooperative
Soil Survey Conference
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What is SRITB?

• Soil Resource Inventory Toolbox
• Initiative by Soil Survey Division to provide automated tools for field soil scientists
Communication – National Bulletins

• SOI – Pedon PC Software Release 430-6-2 April 18, 2006
• SOI – Development of a Soil Resource Inventory Toolbox March 28, 2007
• SOI – Pedon PC 3.0 Software Release May 11, 2007
• SOI – Pedon PC 3.01 Software Release February 29, 2008
• SOI – Soil Resource Inventory Toolbox Software Release SRITB 1.1.18 May 27, 2008
SRITB components:

- Pedon PC
- Analysis PC
- Lab Database Entry Program
- Editing Toolbar (ArcMap extension)
- Soil scientist’s “My Toolbar” (desktop)
Pedon PC

- Prototypes were developed in the field (Montana Migrator and Pedon CE)
- Field soil scientists were major players in the appearance and functionality
- Forms are designed for use in Microsoft Access
- Pedons are uploaded to NASIS via the Soils Hotline
• **Task /Purpose**

Emulate the (historic, and future) workflow in an electronic environment to increase efficiency and reduce the potential for the loss of data.
• Included the evaluation of hardware
• Development of form based data entry application (Pedon PC) for tablets which includes the integration of GPS for recording locations
Pedon PC has two layouts:
United States Department of Agriculture
Natural Resources Conservation Service

Pedon PC layout for PC (landscape)
Both are customizable

Pedons (Points) In NASIS:

<table>
<thead>
<tr>
<th>Date</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 2005</td>
<td>142,487</td>
</tr>
<tr>
<td>March 2006</td>
<td>163,000</td>
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<tr>
<td>March 2007</td>
<td>190,445</td>
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<tr>
<td>Sept 1, 2007</td>
<td>209,209</td>
</tr>
<tr>
<td>June 11, 2008</td>
<td>243,445</td>
</tr>
</tbody>
</table>
Analysis PC

• Prototypes developed in the field (Montana Pedon PC Plus)
• Forms built in Microsoft Access
• Links between Access and ArcMap
Analysis PC main menu

- The Analysis Form
- Statistics Form
- Textual Triangle Menu...
- Data View Forms Menu...
- Setup Menu...
- Utilities Menu...
- Exit Analysis PC

Version 1.0B BETA
Analysis PC:

1. Analysis form: uses Access built queries to display selected sets
• Allows the user to send data to ArcMap
• Users can filter data and label maps
Laboratory Data Entry Program

- Numerous universities, states, and other entities collect and store soil data
- Lab Database Entry Program is an attempt to centralize this external data into our system
Lab Database Entry main menu

- Edit Analyte Procedure Rules
- Setup
- Enter Lab Data Without Pedon Data
- Enter Lab Data With Pedon Data
- Open The Pedon PC Program
- Compact and Repair Database
- Exit Application

Open Setup Form on Startup
Inventory & Interpret Soil Resources: Data Flow Diagrams

2/2006

Soil Observations

- Soil Lab Samples
- Soil Lab Database (LIMS)
- Pedon Descriptions, Transects, Traverses, & Field Notes
- Data Loggers (e.g., soil temperature, moisture, water table, & geophysical data)
- Electronic Field Data Collection (WinPedon, PedonCE, PedonPC)
- Digital Camera
- Soils Office PC (No link to transactional database)
- Official Series Descriptions/Soil Classification
- Quality Control, Quality Assurance, Correlation
- Tabular Data to Staging Server
- Spatial Data to Staging Server
- Certified Data
- WMS Data Flow Direction
- Communication Link

Soil Polygons, Lines, & Points

- Analog Process
- All Digital Process
- Draw Lines & Points on Paper Maps
- Acquire Digital Layers (e.g., DEM, DOQ, DRG, LIDAR from NCGC)
- Pre-Map (ArcGIS, ERDAS, models)
- Draw Polygons, Lines, & Points in the Field (ArcGIS, ArcPad)
- Edit
- Preliminary Digital Product
- Certification of Spatial Data at Digitizing Unit
- Spatial Data to Staging Server
- Certified Data
- No link to transactional database

Legend
- Linked or Stored in Transactional DB
- Not Linked or Stored in Transactional DB
- Spatial data flow
- Data Flow Direction
- Communication Link

Editing Toolbar focuses here
Editing Toolbar

• Adds a suite of toolbars to ArcMap (loads as an extension)
• Programmed to simplify GIS digitizing procedures and data capture.
• Developed to increase the efficiency of field digitizing and data collection.
• Designed to maximize screen real estate
• Provide field scientists with enough GIS capability to make informed decisions in the field.
• Digitizing standards are pre-set as the defaults so user does not have to know or understand all the details of these standards
Six toolbars in one:
Tools common to all toolbars:

The Toolbars, Previous, Next, and TOC (Table of Contents) Tools/icons are displayed on all edit toolbars.
Edit Manager (preferences settings)
Edit Manager

Editor icons

Start Editing  Stop Editing  Save Edits
Edit Manager

Tolerance Settings icons

Snapping environment

Set Snapping Distance

Set Sticky Move Tolerance

Set Stream Tolerance

Snapping Distance

Sticky Move Tolerance

Stream Tolerance:

- Map Units: 30
- Points together: 30
Edit Toolbar

- **Editing Tools**
  - Streaming
  - Sketch

- **Topology Editing Tools**
  - Reshape Edge
  - Modify Edge

- **Editing Tools**
  - Cut Polygon
  - Create Island Polygon
  - Merge
  - Auto Complete Polygon
Sketch Toolbar

- Draw using a Thin pen
- Add Ink
- Erase Ink
- Finish Ink Sketch
- Clear Ink Sketch
- Undo
- Ink Settings
GPS Toolbar

Pedon PC Applications

- Auto- Populate From Current GPS Position
- Auto- Populate From Selected points
- Auto- Populate From Clicked location
- Connects GPS to Application
- Displays GPS Position On Screen
- Information On GPS Receiver
- Navigation Using GPS
- Collect Point

Close Connection
Auto population of Location
Setup Tools

- Proper setup is critical to data quality
- Setup Toolboxes simplify and bullet-proof setup and offer standardization
- Two Options - initial or update survey
- Options within options for different types of setup
- Packaged separately from SRITB
New Soil Survey Area ID

The Soil Survey Area ID (SSAID or AREASYMBOL) will be used to name the geodatabase, featuredataset and featureclasses created by this script tool.

Any alphanumeric string may be entered as long as the first character is ALPHA. The normal standard is a two letter state abbreviation + a three digit number. Do not use 'special characters'.

An example of a valid SSID would be "TX045".
My Toolbar (in development):

Provides links to web and client applications that are relevant to soil science on a desktop toolbar
<table>
<thead>
<tr>
<th>Tool/Resource</th>
<th>URL</th>
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<tbody>
<tr>
<td>Pedon PC</td>
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<tr>
<td>Analysis PC</td>
<td>C:\analysis\analysis_pc.mdb</td>
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<tr>
<td>ArcMap</td>
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<td>Technical References</td>
<td><a href="http://soils.usda.gov/technical/">http://soils.usda.gov/technical/</a></td>
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<td>Series Extent Mapping Tool</td>
<td><a href="http://www.cei.psu.edu/soiltool/semtool_phase2.html">http://www.cei.psu.edu/soiltool/semtool_phase2.html</a></td>
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<td>Soil DataMart</td>
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<td>Training</td>
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<td>NRCS HomePage</td>
<td><a href="http://www.nrcs.usda.gov/">http://www.nrcs.usda.gov/</a></td>
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Questions?