Soil Resource Inventory Tool Box (SRITB)

State Soil Scientists' Meeting
March 17 – 20, 2008

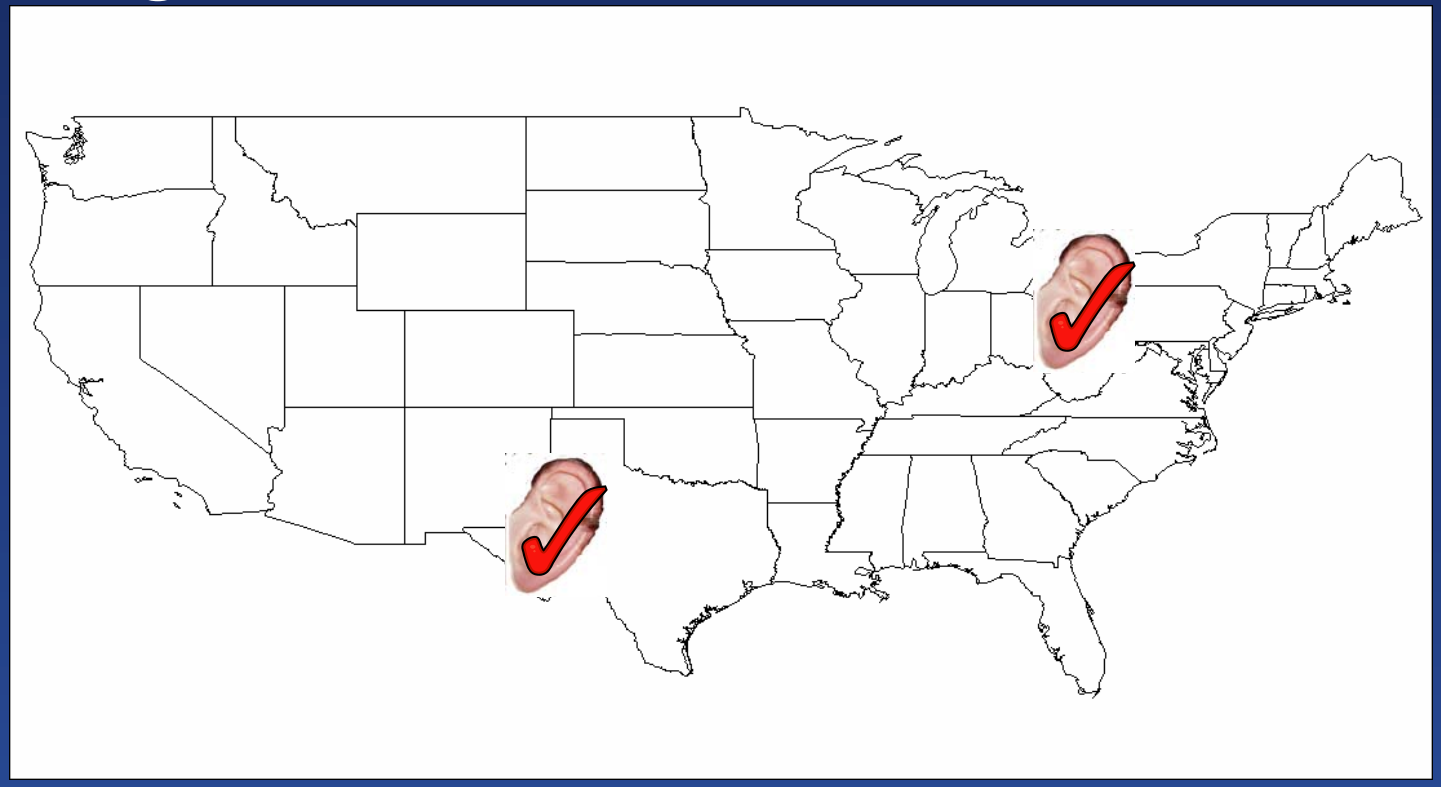
What is SRITB?

- Soil Resource Inventory Toolbox
- Initiative by Soil Survey Division to provide automated tools for field soil scientists

SRITB components:

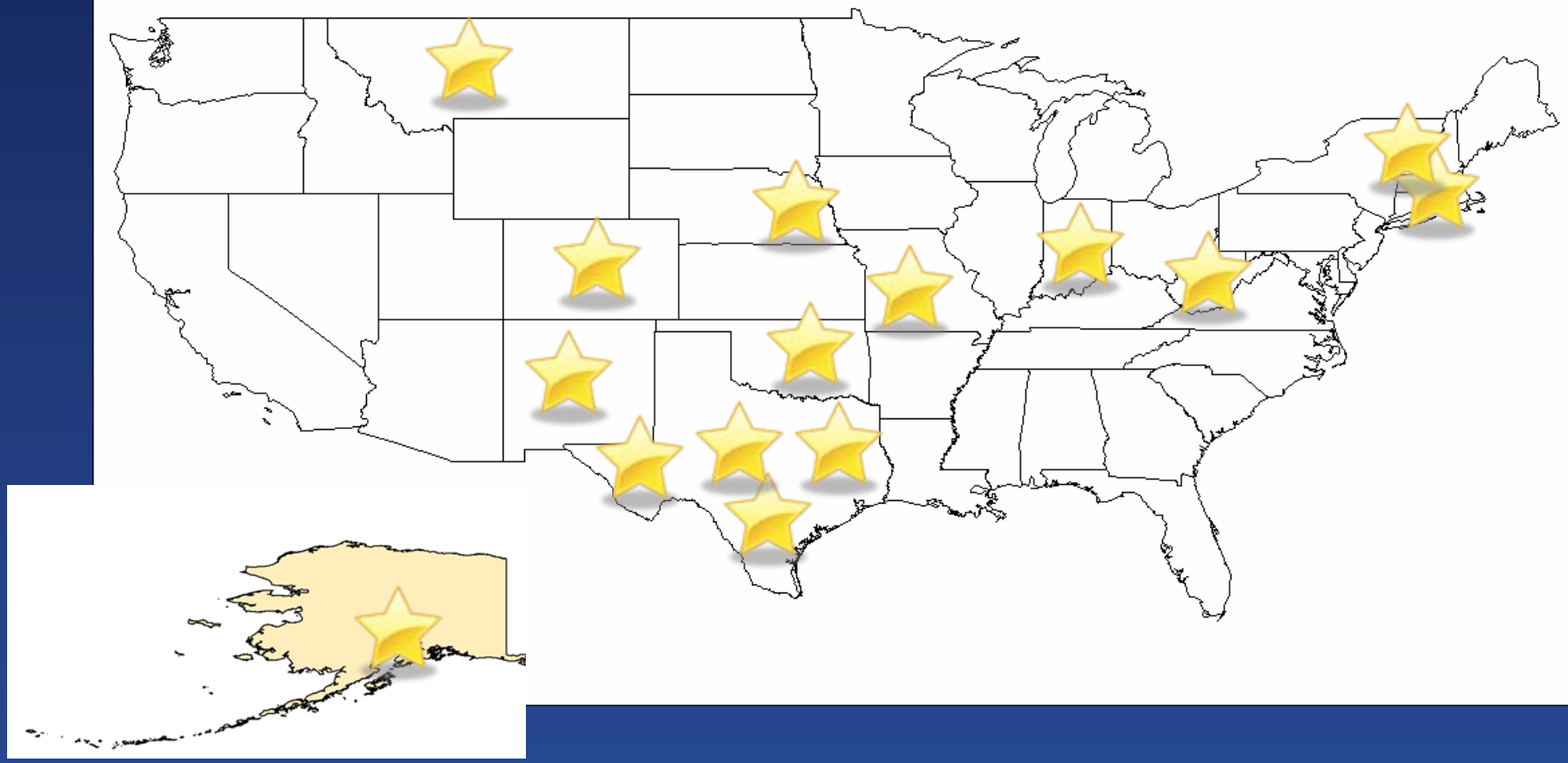
- Pedon PC
- Analysis PC
- Lab Database Entry Program
- Editing Toolbar (ArcMap extension)
- Soil scientist's "My Toolbar" (desktop)

- Funded primarily by Congressional earmarks from West Texas and West Virginia



2005 – Point Data Collection Team/Development Team

One of six teams and subset of 89 + individuals



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

- And - Beta Test Announcements

  Pedon PC 3.01 Beta Test Nov 26 - Dec 10, 2007

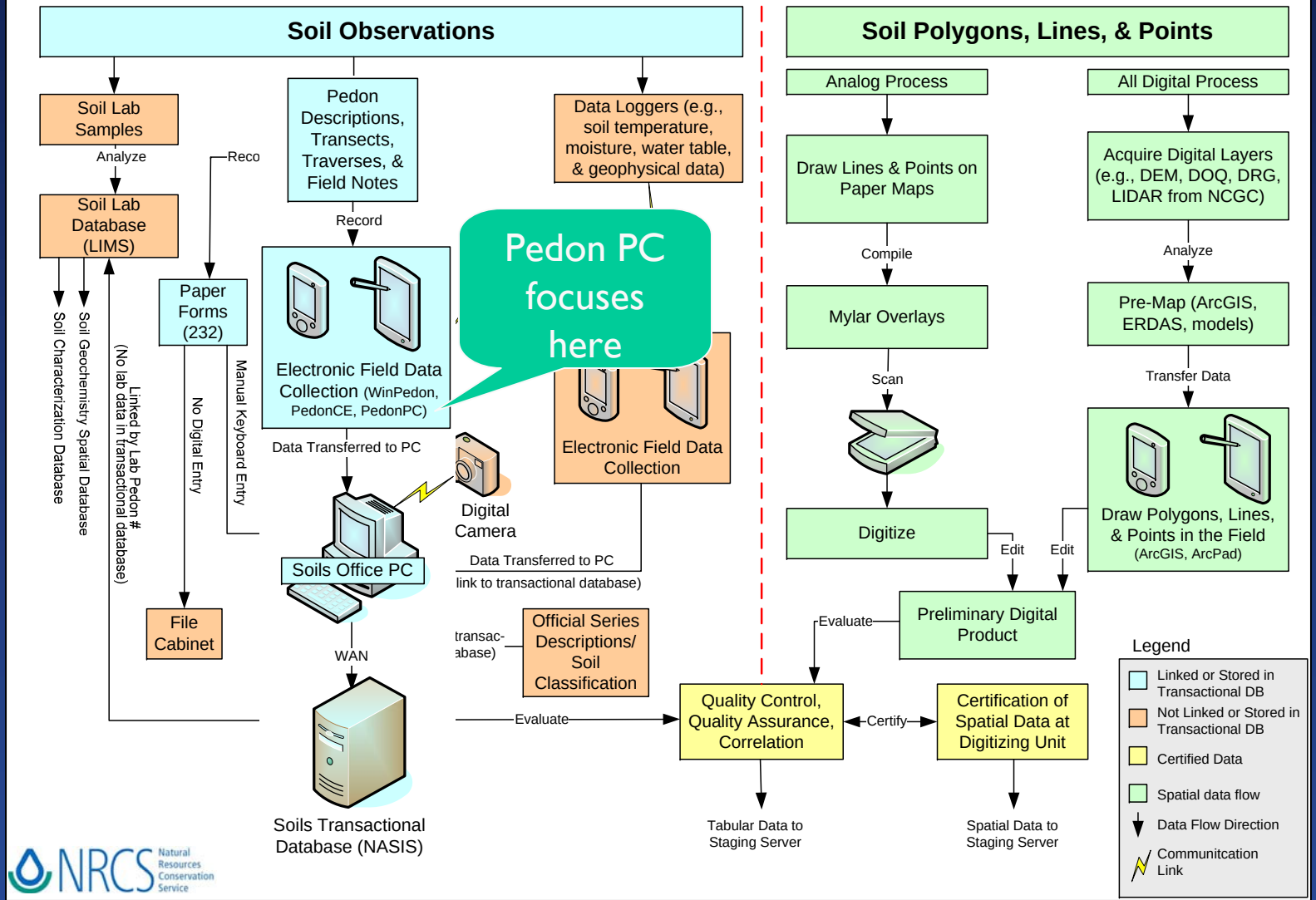
  Pedon PC Job Aids added to NSSC Training Website

  SRITB 1.1.17 Beta Test Dec 12 – Dec 20, 2008

  Analysis Tools Beta Test March 3 – March 12, 2008

Inventory & Interpret Soil Resources: Data Flow Diagrams

2/2006



NRCS Natural Resources Conservation Service

Pedon PC

- Prototypes were developed in the field (Montana Migrator/Pedon PC Plus 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

United States Department of Agriculture
Natural Resources Conservation Service

USDA NRCS

Soil Sampling

IDAHO

MISSOURI

WEST VIRGINIA

NEW HAMPSHIRE

ALASKA

UTAH

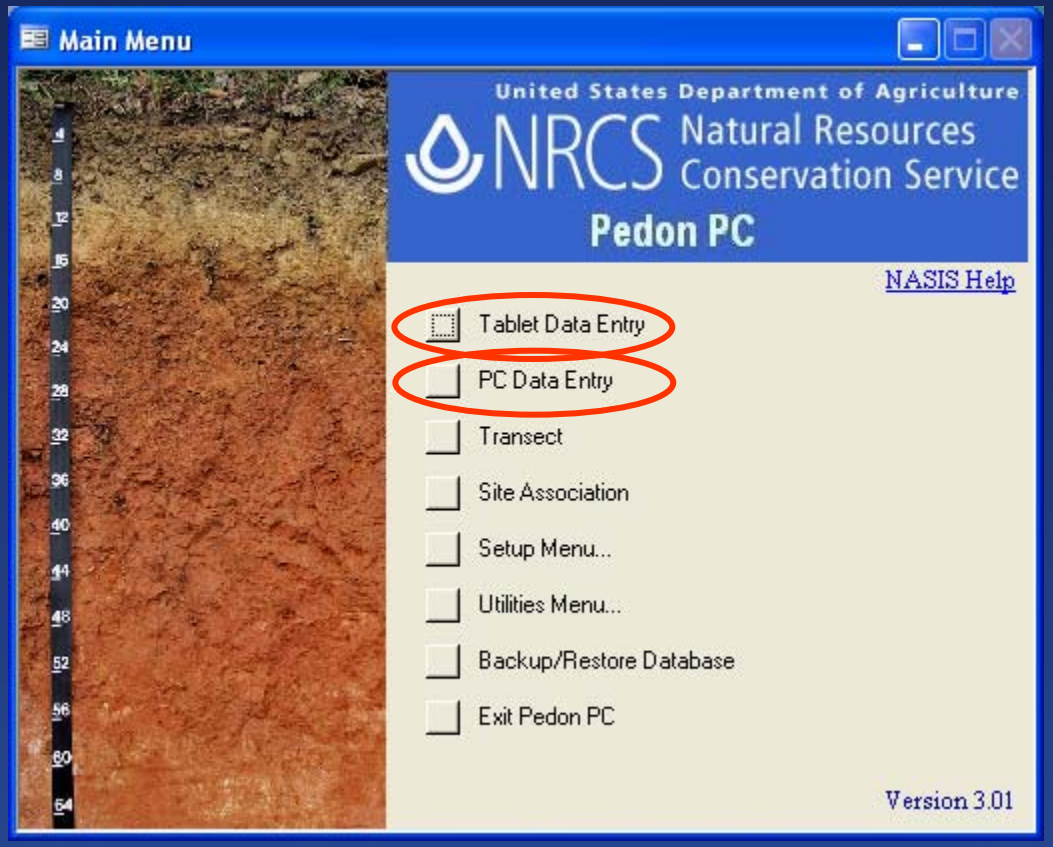
MISSOURI and INDIANA

WEST VIRGINIA

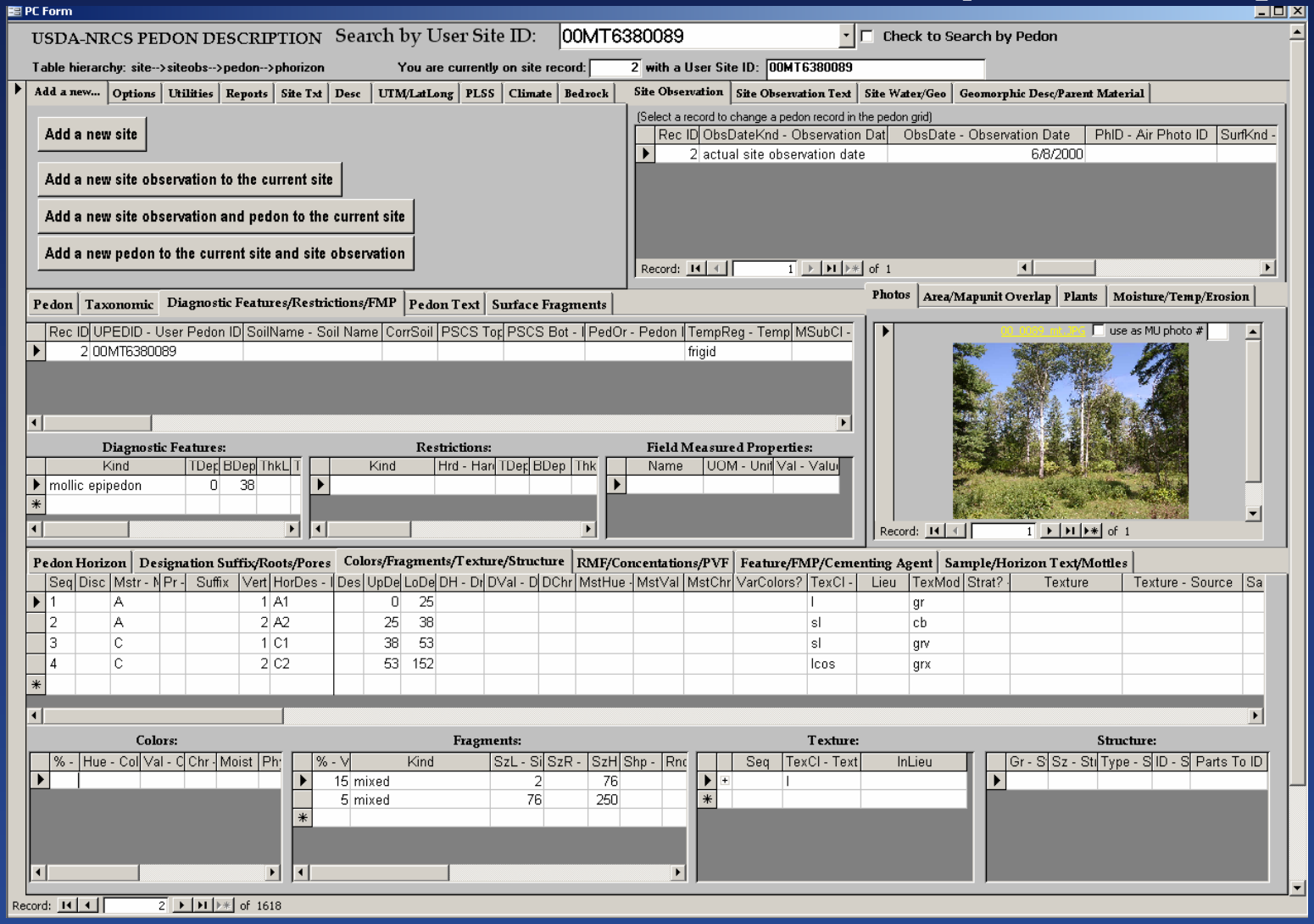
DISTRICT OF COLUMBIA

- Development of form based data entry application (Pedon PC) for tablets which includes the integration of GPS for recording loctaions

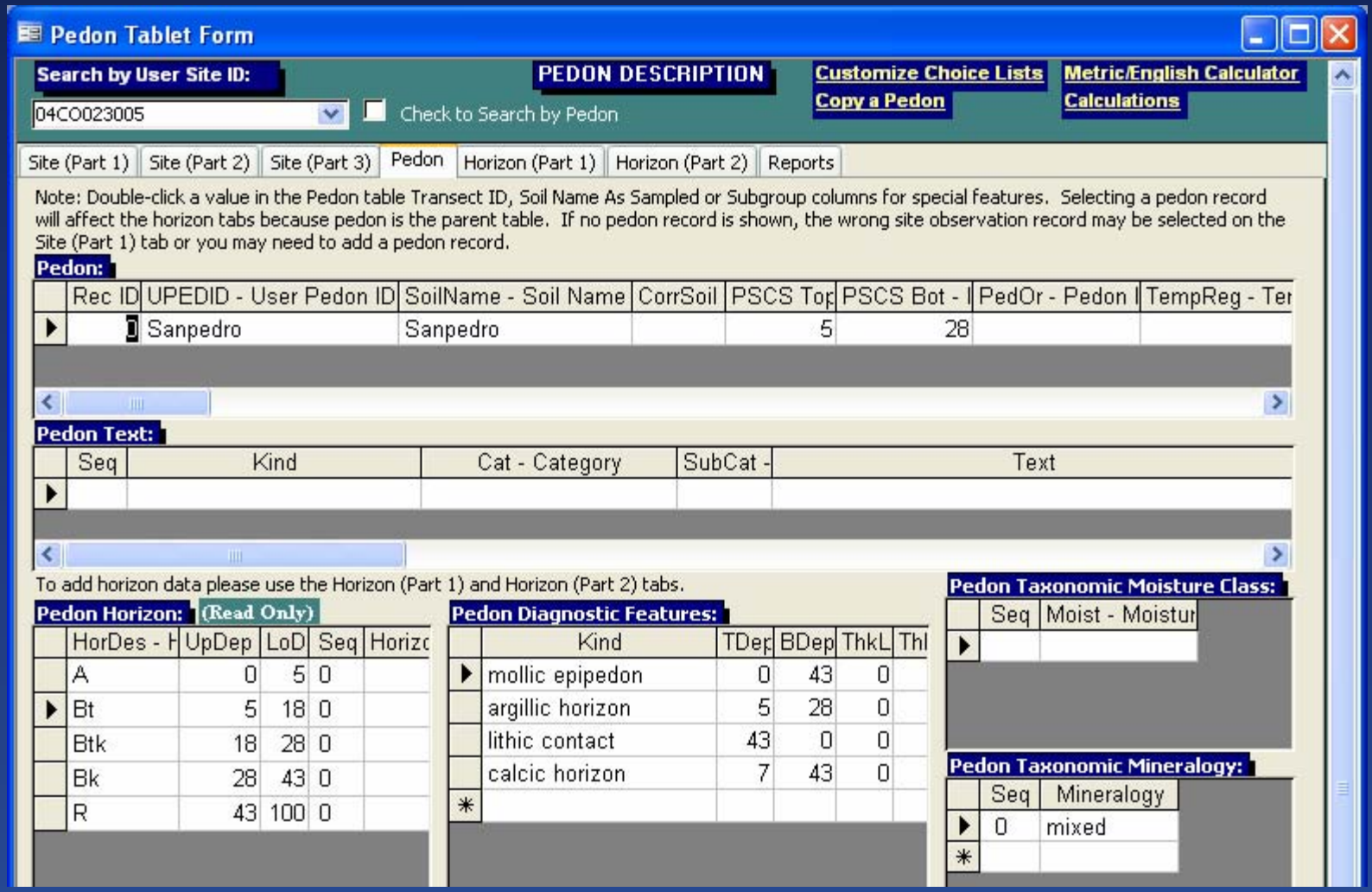
Pedon PC has two layouts:



Pedon PC layout for PC (landscape)



Pedon PC Tablet layout (portrait)



Both are customizable

Pedons Added to NASIS since:

April 2005 162,275 (Very rough)

Year 1 39,481

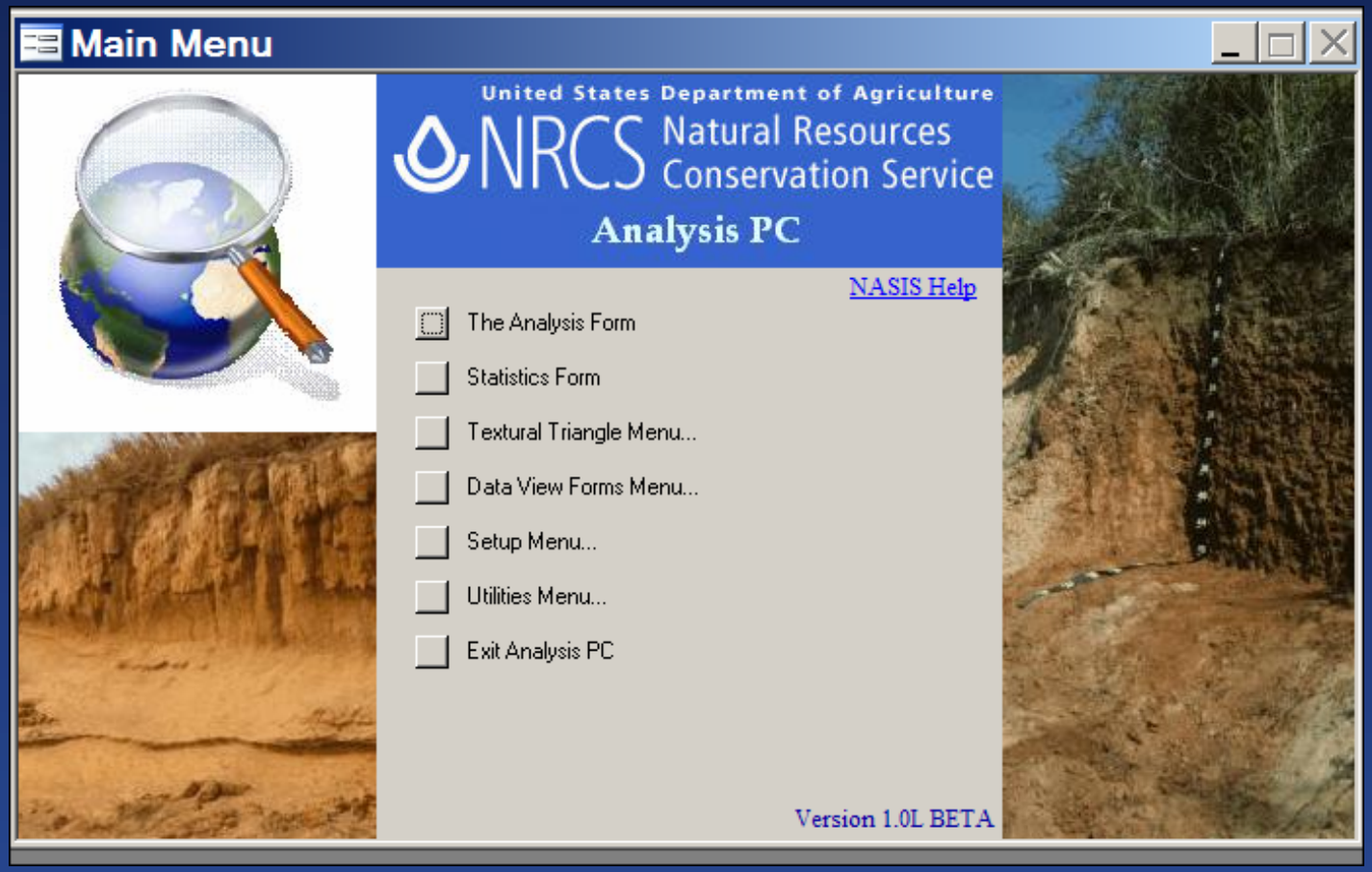
Year 2 59,401

Last 6 months 27,578

Analysis PC

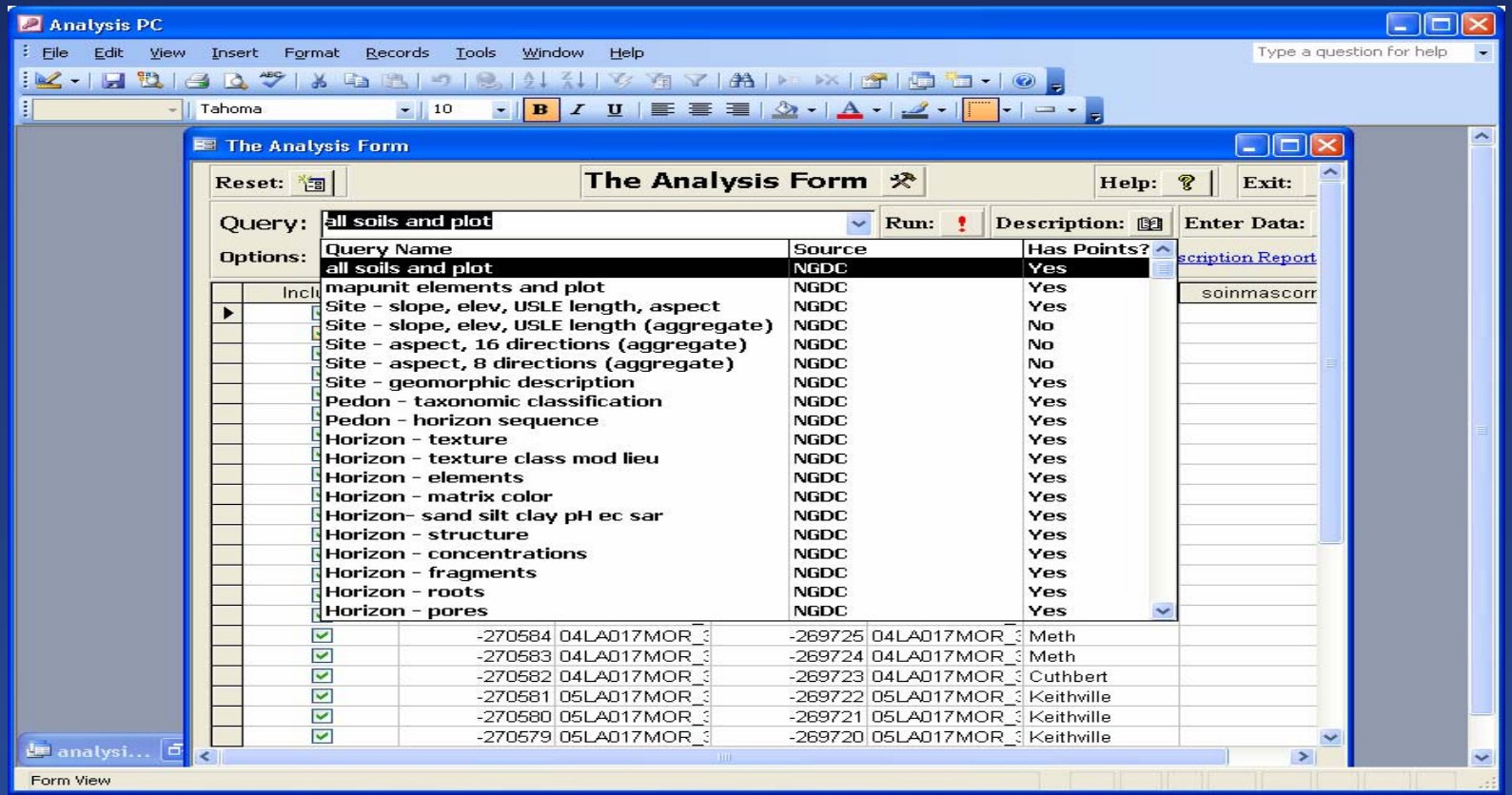
- Prototypes developed in the field (Montana Pedon PC Plus)
- Forms built in Microsoft Access
- Links between Access and ArcMap

Analysis PC main menu

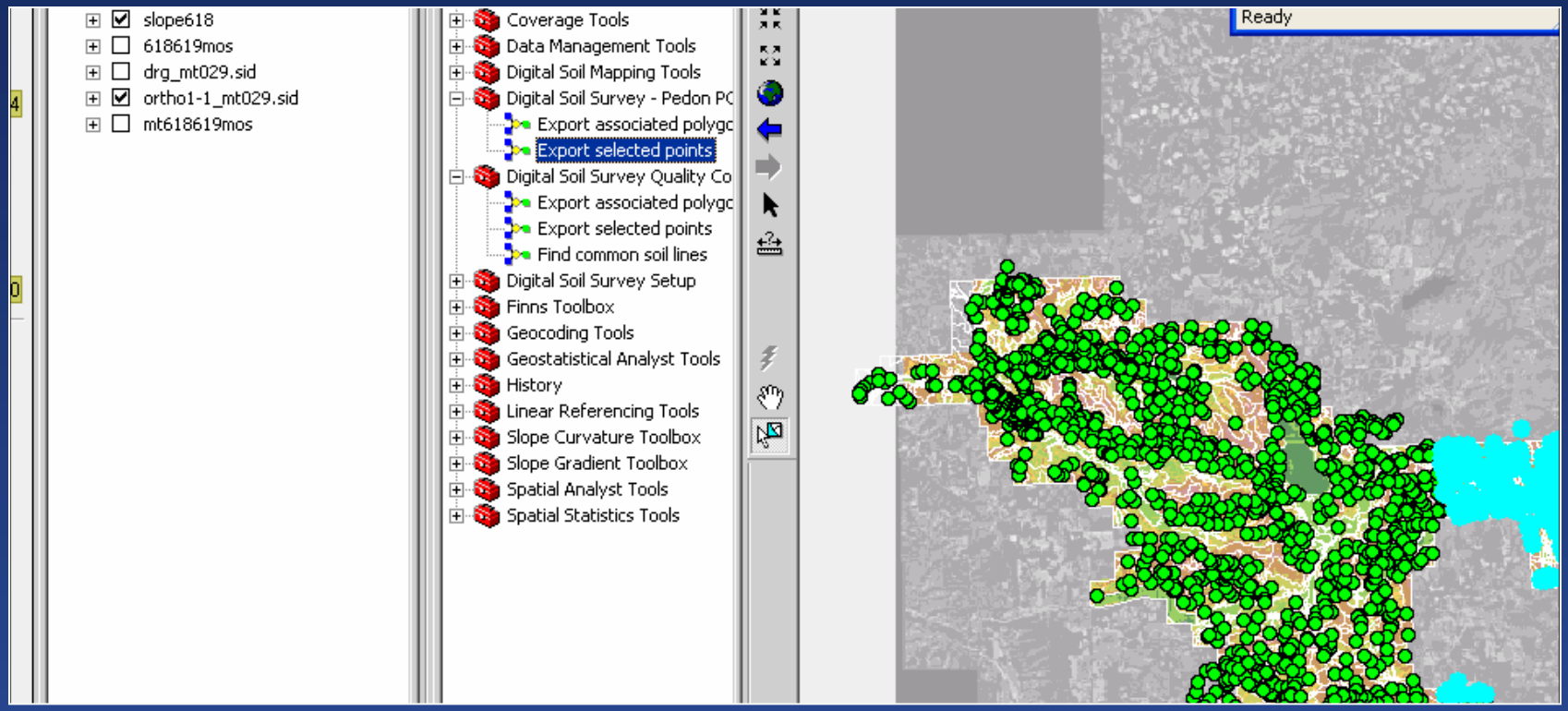


Analysis PC:

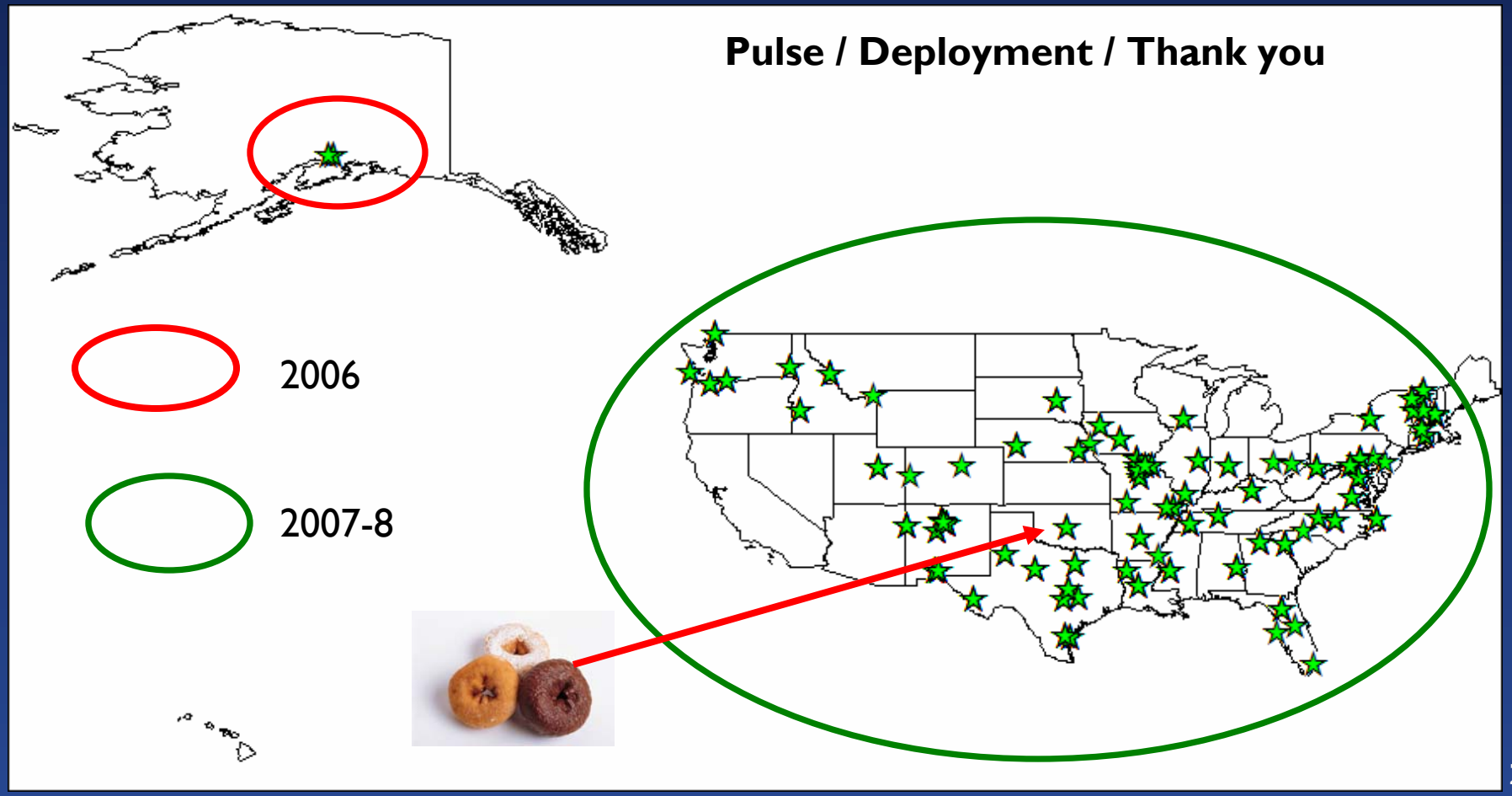
1. Analysis form: uses Access built queries to display selected sets



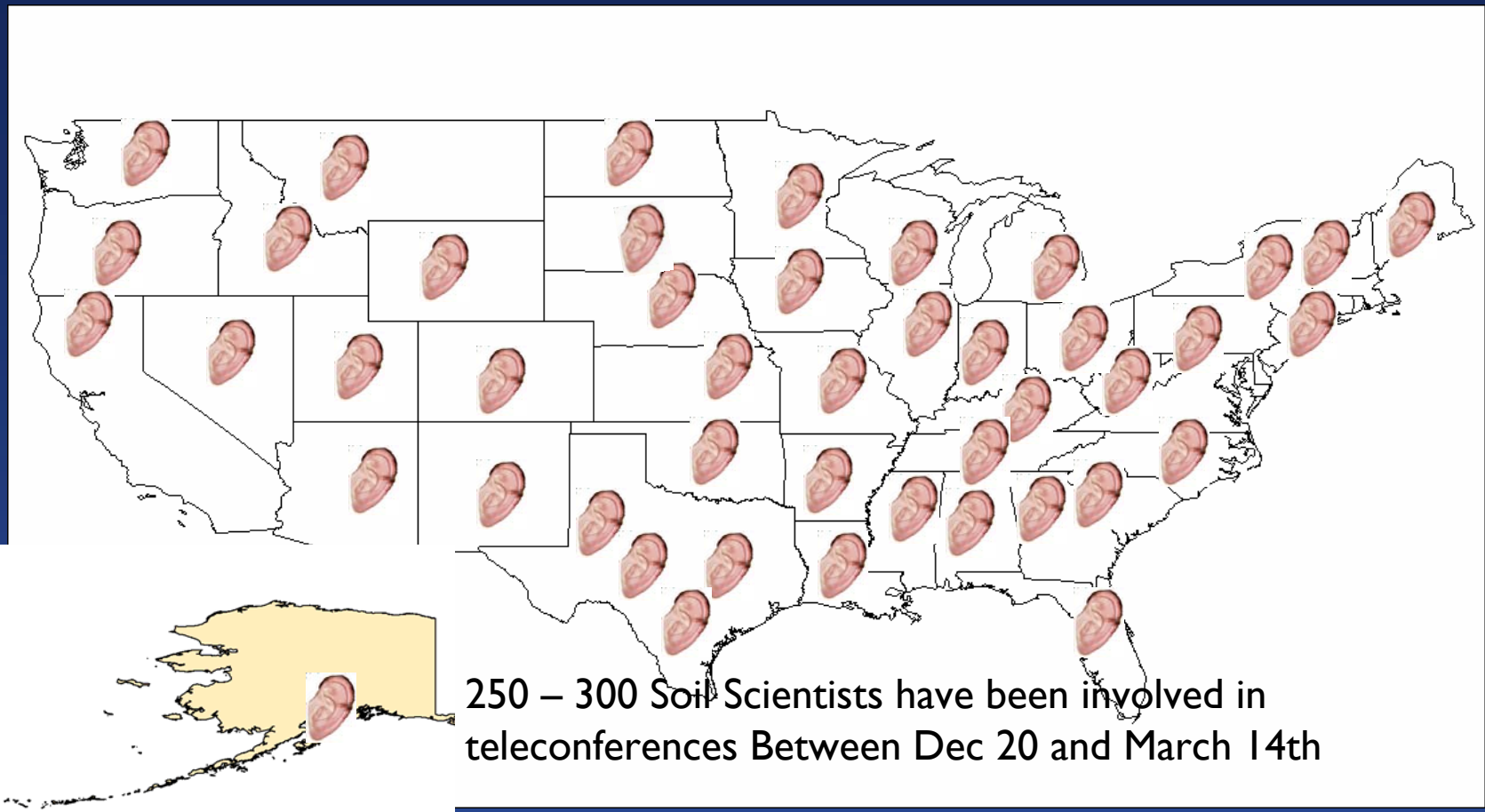
- Allows the user to send data to ArcMap



Pulse / Deployment / Thank You's



2008 - Deployment



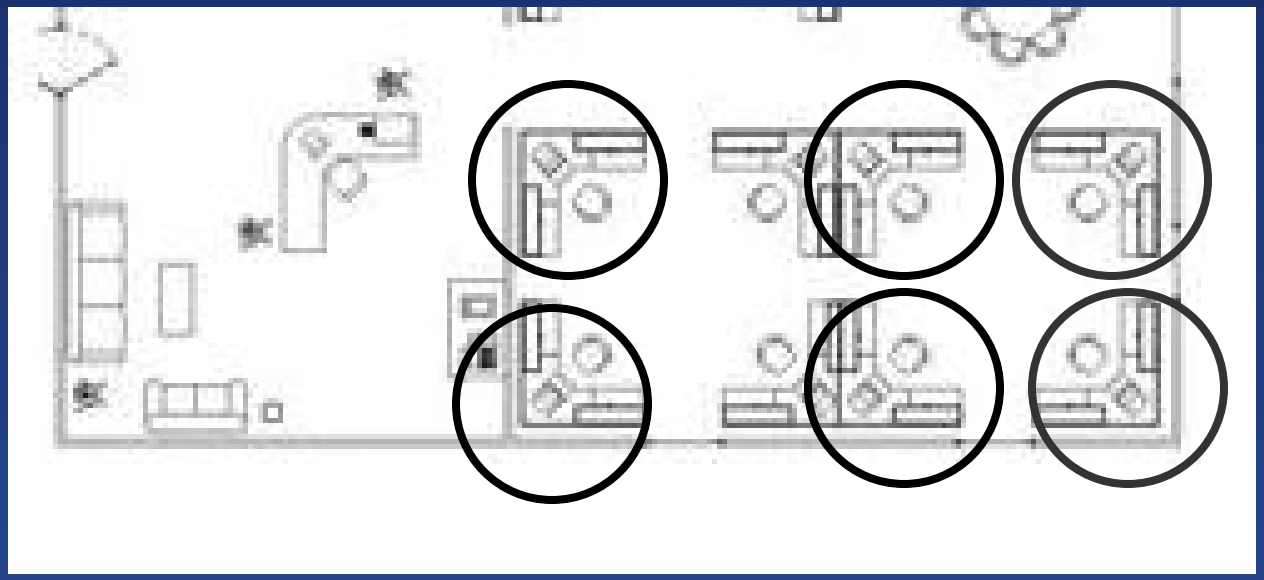
250 – 300 Soil Scientists have been involved in teleconferences Between Dec 20 and March 14th

(Hawaii)

Deployment Within Offices

PEDON PC

SRITB TOOLBAR

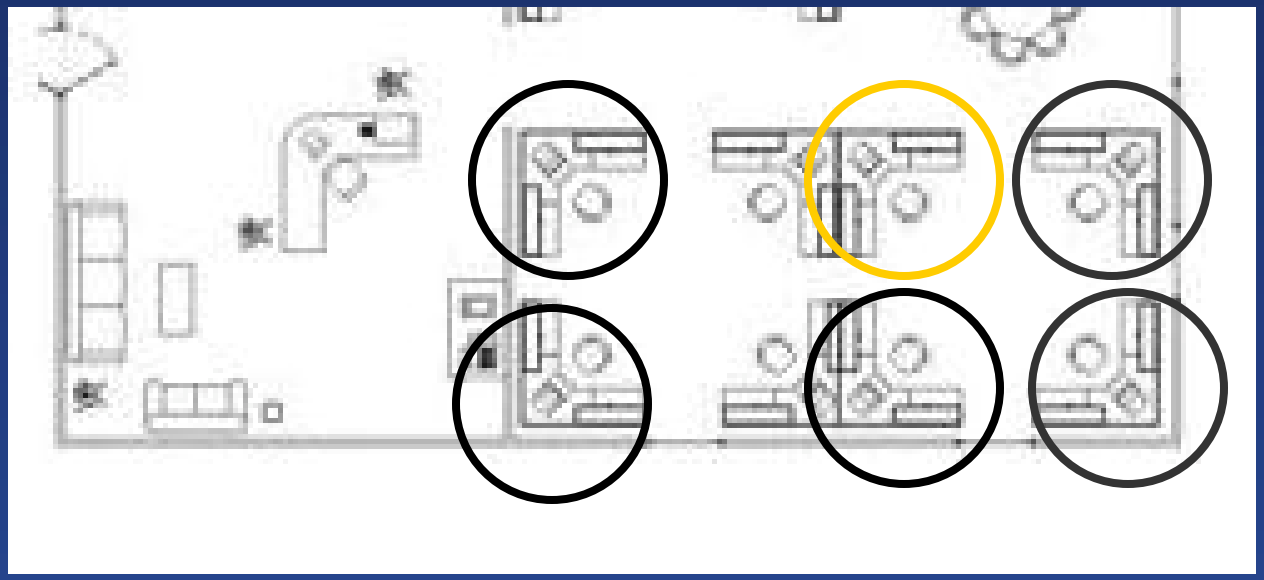


NOT REACHED/
NOT ADOPTED

Deployment Within Offices

PEDON PC

SRITB TOOLBAR



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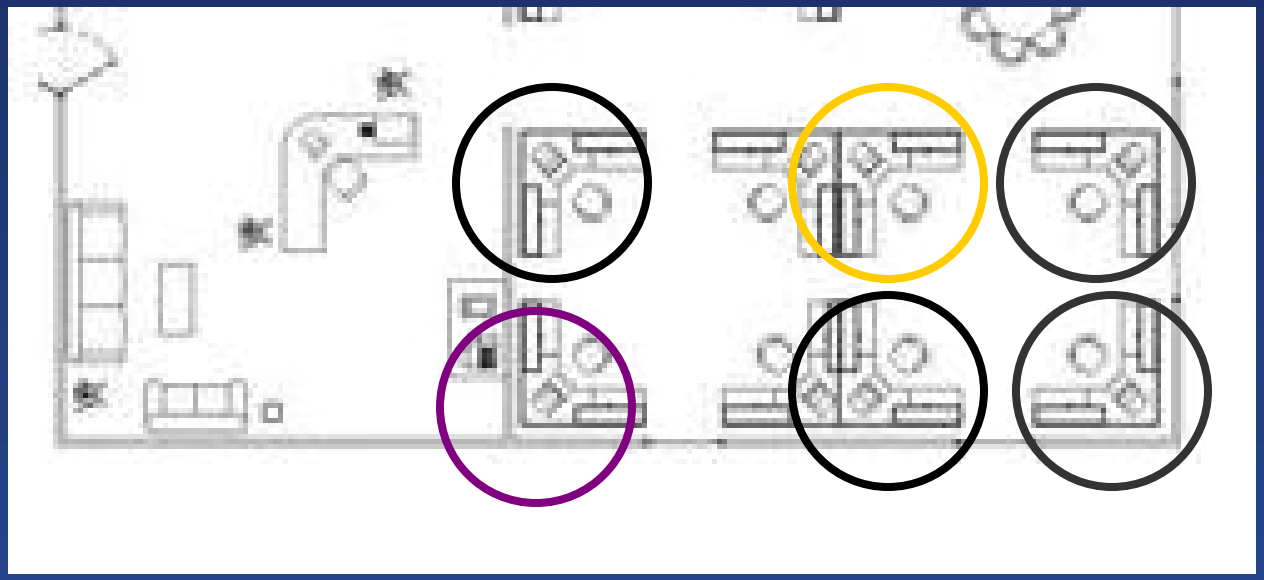
Deployment Within Offices

PEDON PC

SRITB TOOLBAR



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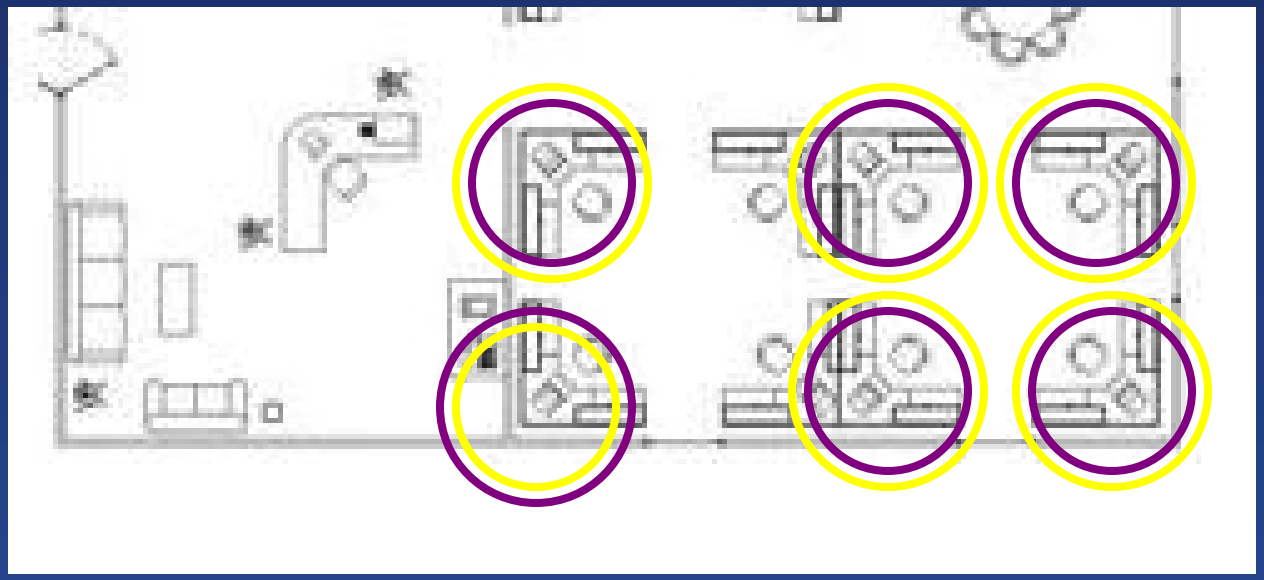
Deployment Within Offices

PEDON PC

SRITB TOOLBAR

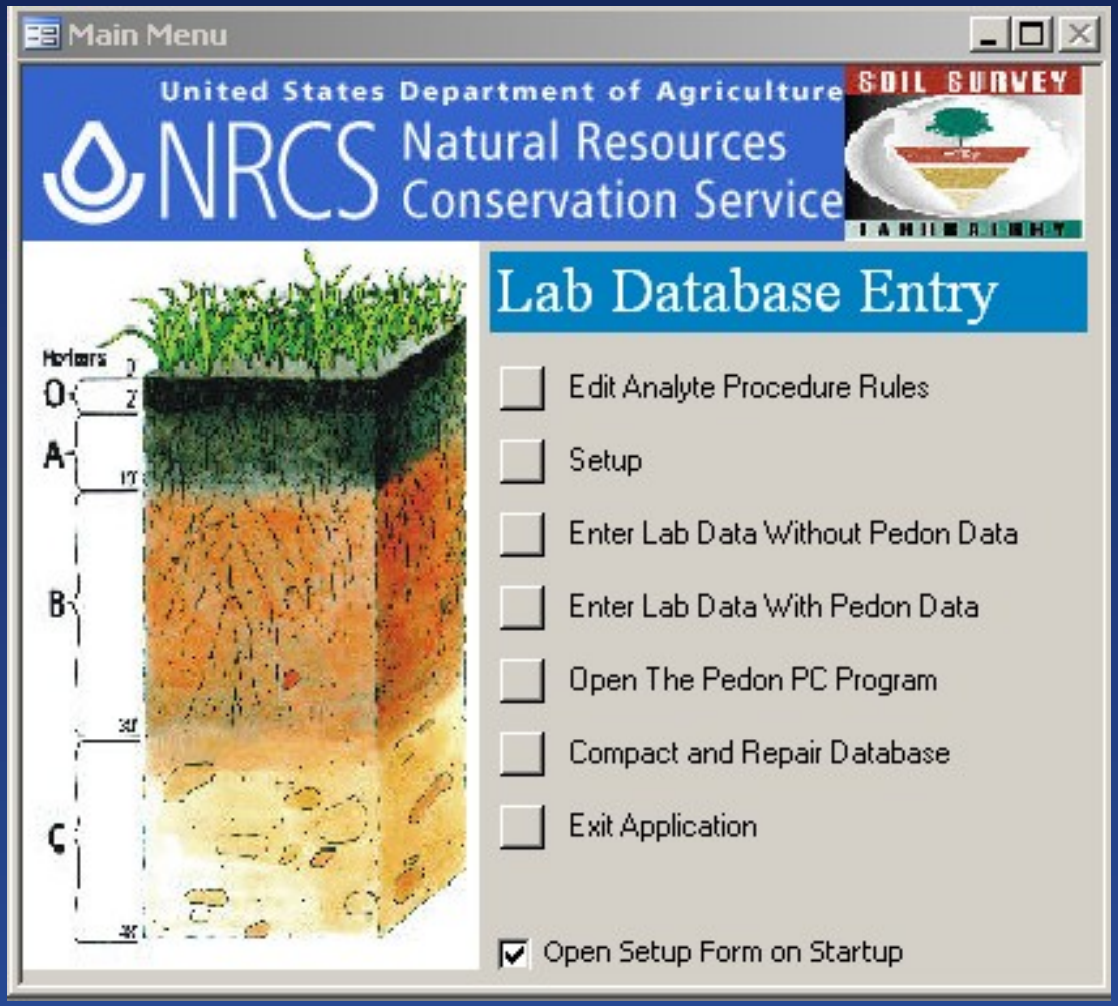


NOT REACHED/
NOT ADOPTED

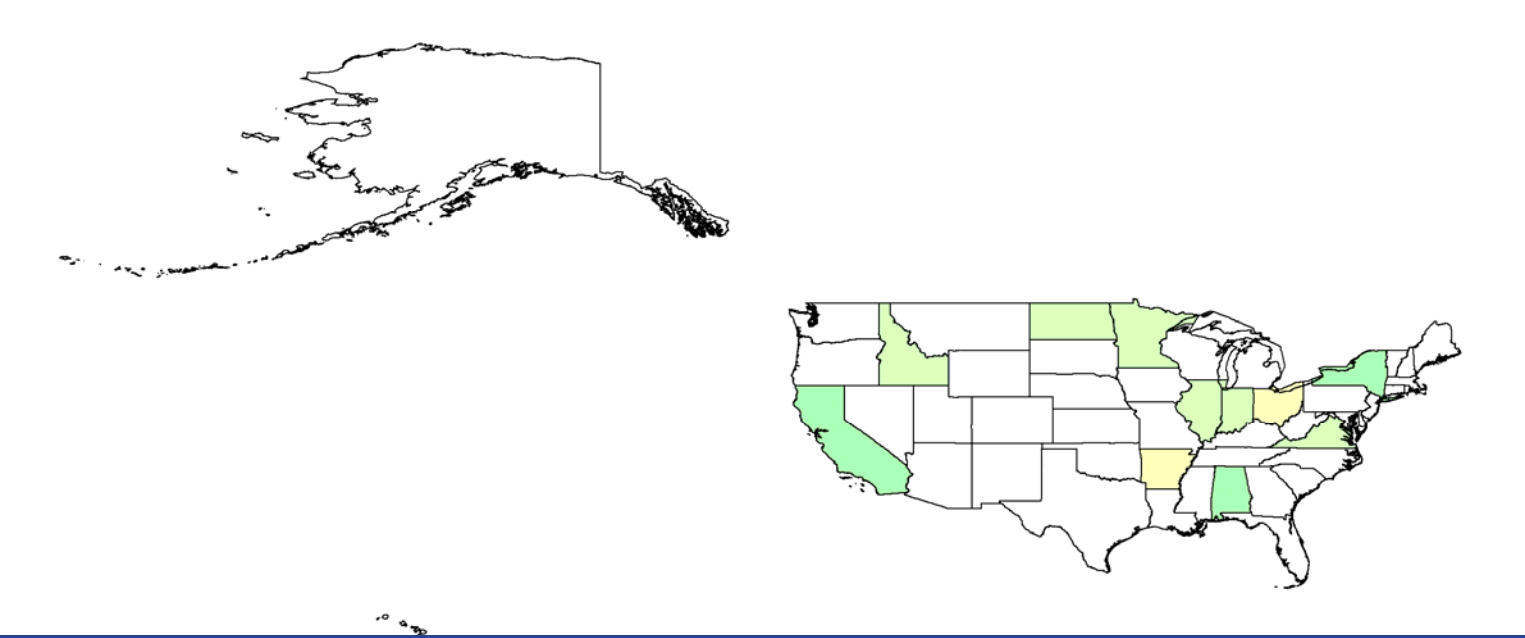
Laboratory Data Entry Program

- 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

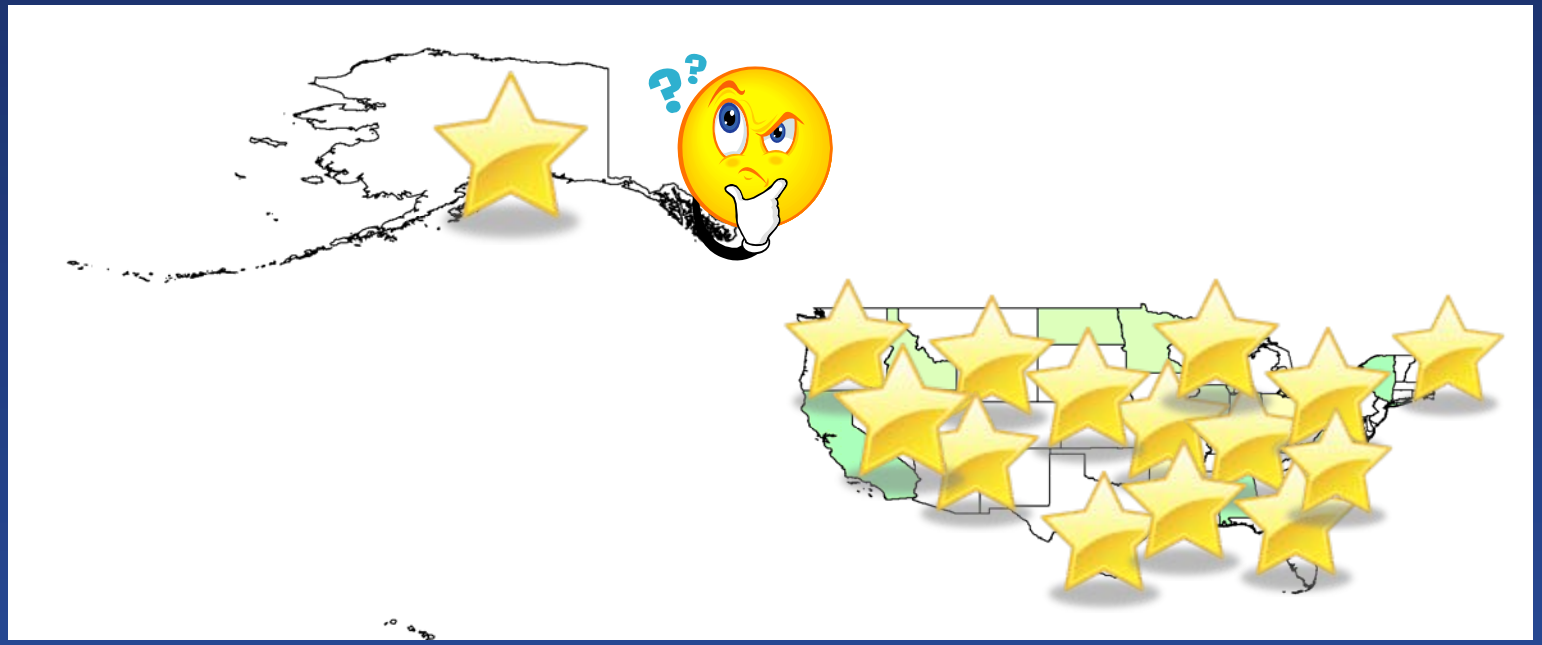
Lab Database Entry main menu



University Laboratory Data Project involves nine universities +

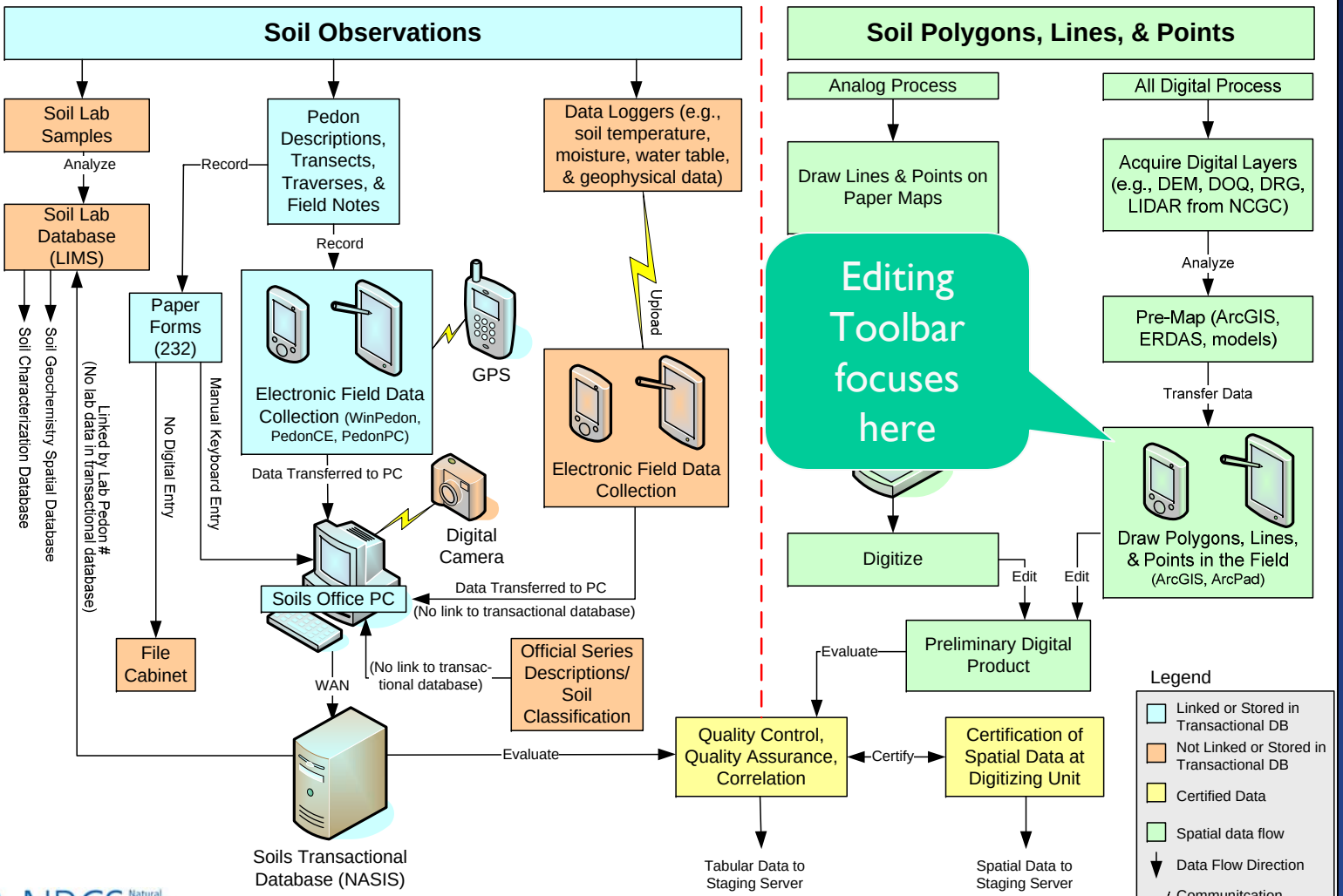


Additional Data is Available from Multiple Universities / Agencies in About Every Corner of the Country, The Question is "Where is it?"



Inventory & Interpret Soil Resources: Data Flow Diagrams

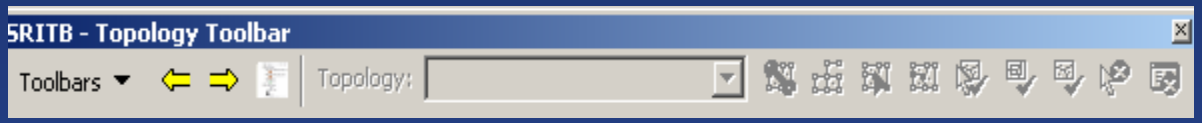
2/2006

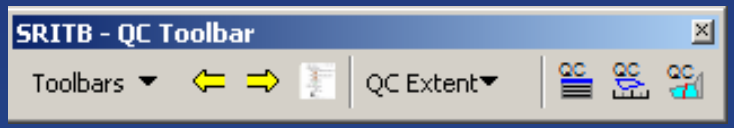


Editing Toolbar

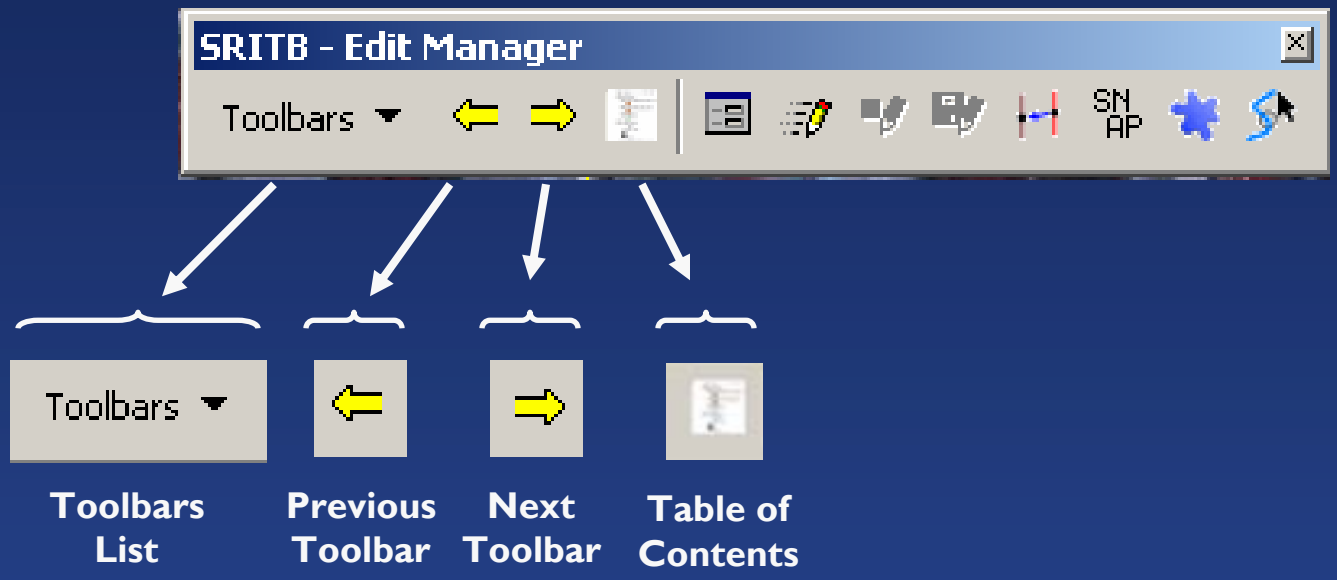
- Adds a suite of toolbars to ArcMap (loads as an extension)
- Programmed to simplify GIS digitizing procedures and data capture.
- Developed to increase the efficiency of field digitizing and data collection.
- Designed to maximize screen real estate
- Provide field scientists with enough GIS capability 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:



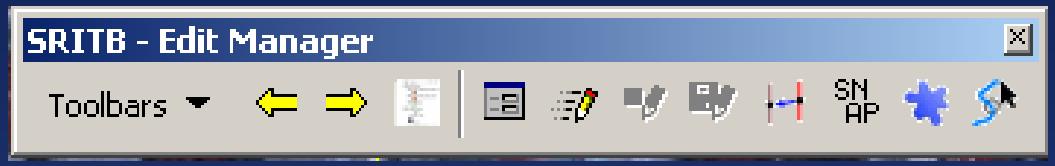


Tools common to all toolbars:

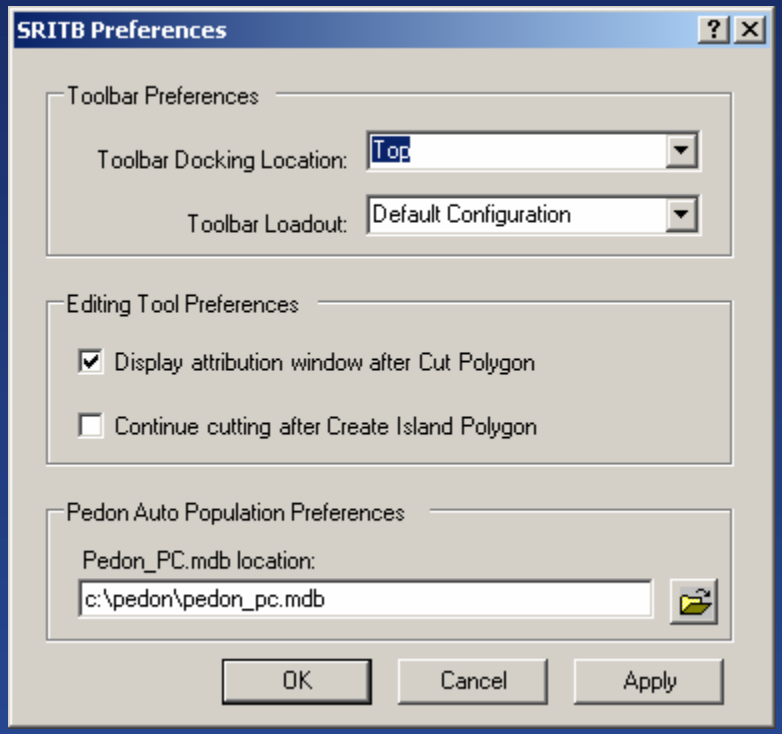


The Toolbars, Previous, Next, and TOC (Table of Contents) Tools/icons are displayed on all edit toolbars.

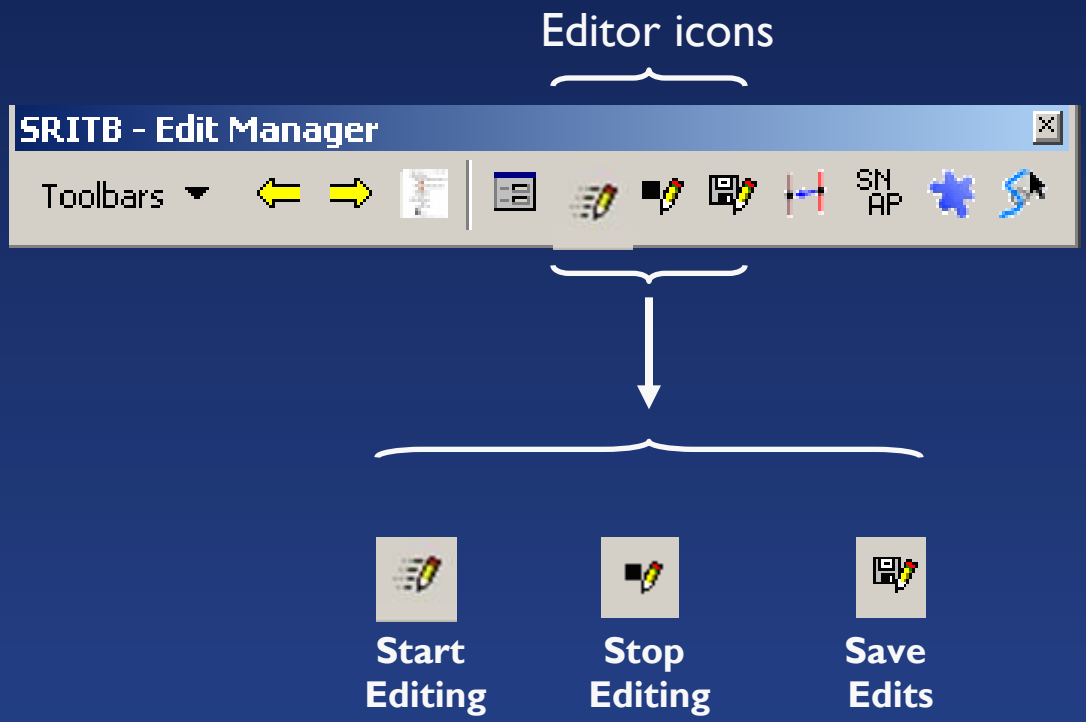
Edit Manager (preferences settings)



Preferences



Edit Manager



Edit Manager

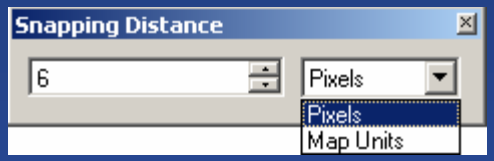
Tolerance Settings icons

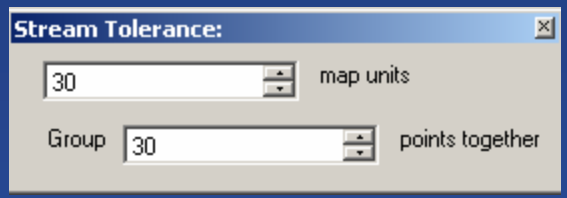
Snapping environment

Set Snapping Distance

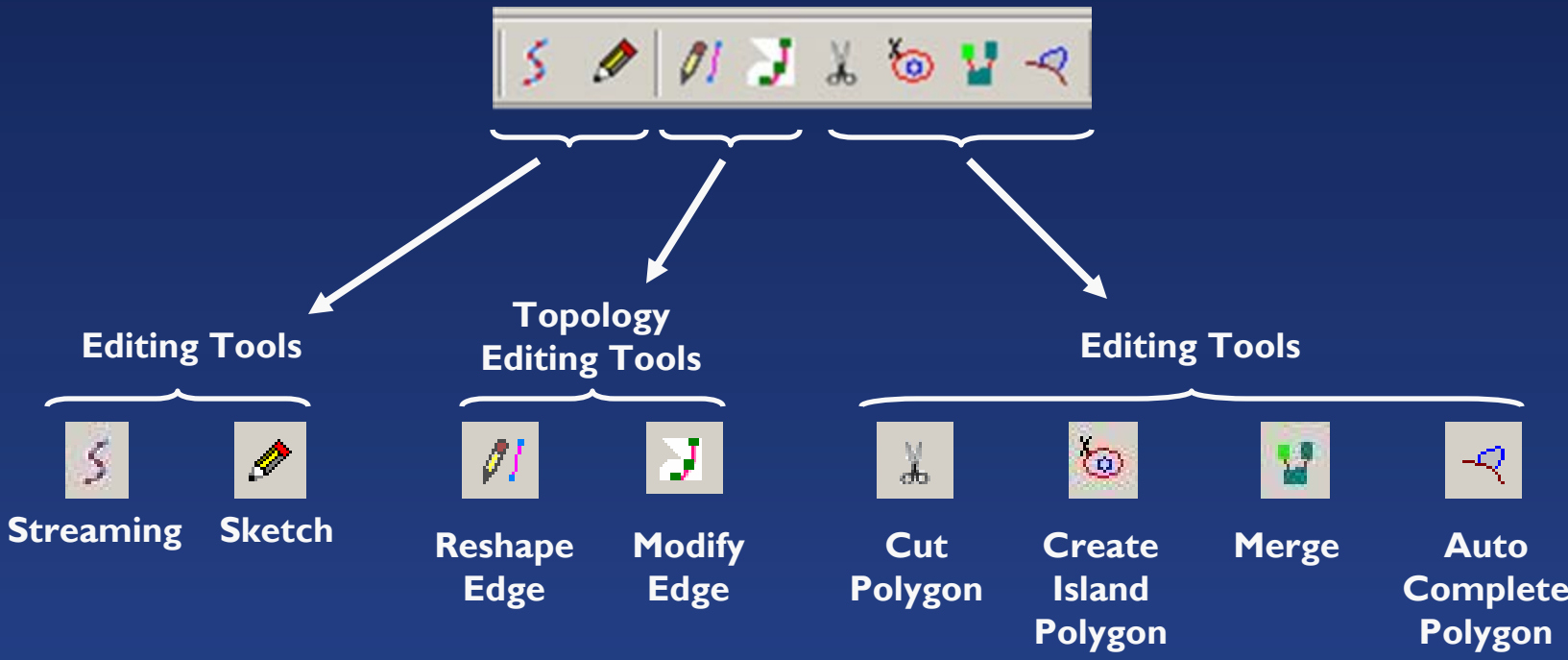
Set Sticky Move Tolerance

Set Stream Tolerance





Edit Toolbar



Custom Edit Tools
Saving Keystrokes (Ex: Cutting Polygons)

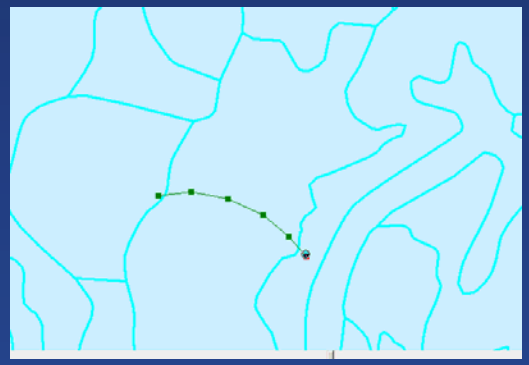
Out-of-the-Box ArcMap

1. Start Editing
2. Set task to Cut Polygon Features
3. Activate Select Features Tool
4. Select features
5. Activate Sketch Tool
6. Make cut
7. Explode multi-part features
8. Label features

SRITB Cut Polygon Tool

1. Activate Cut Polygon Mode
2. Select features
3. Make cut
4. Label features

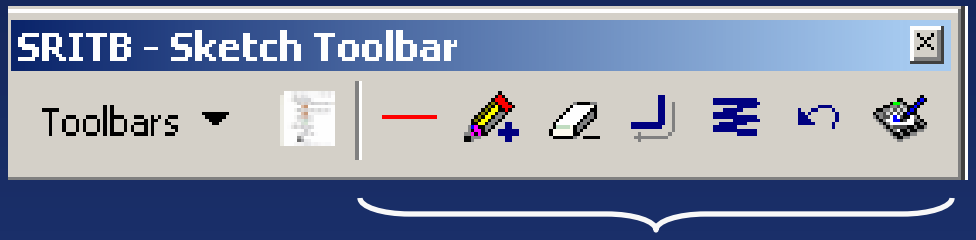
Cut Polygon



Custom Edit Tools Improving Quality

- Proper tools to perform task are automatically selected
  - Using the wrong tools creates errors
- Quality control is built-in

Sketch Toolbar



Draw using a Thin pen

Add Ink

Erase Ink

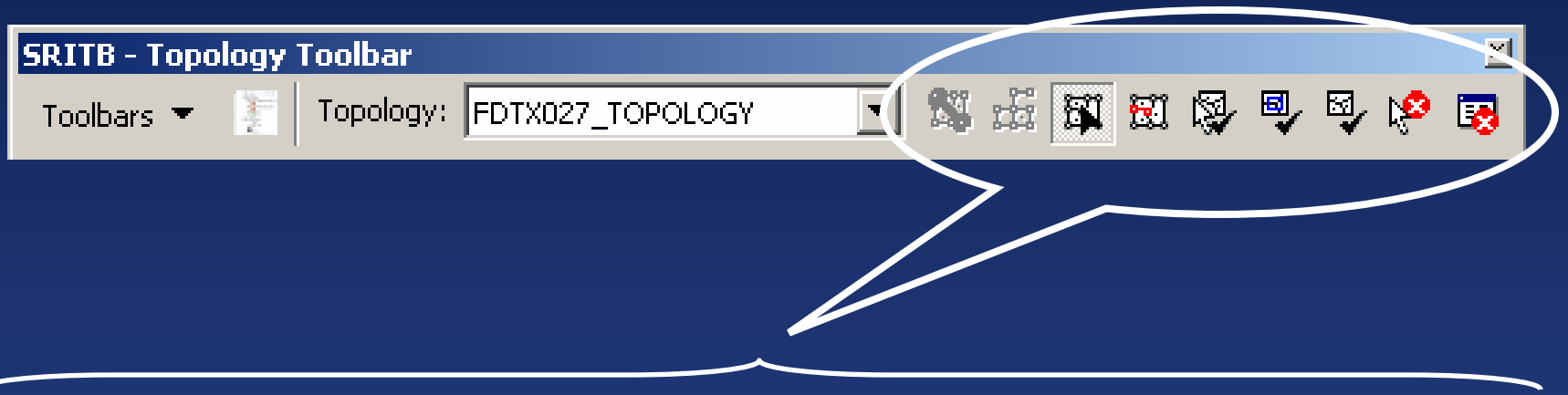
Finish Ink Sketch

Clear Ink Sketch

Undo

Ink Settings

Topology Toolbar



Construct Features

Planarize Lines

Topology Edit

Show Shared Features

Validate Topology In Specified Area

Validate Topology In Current Extent

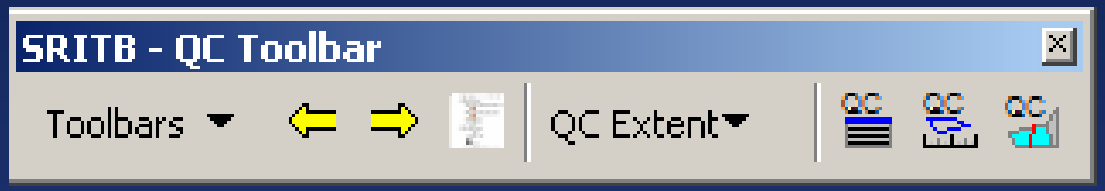
Validate Entire Topology

Fix Topology Error

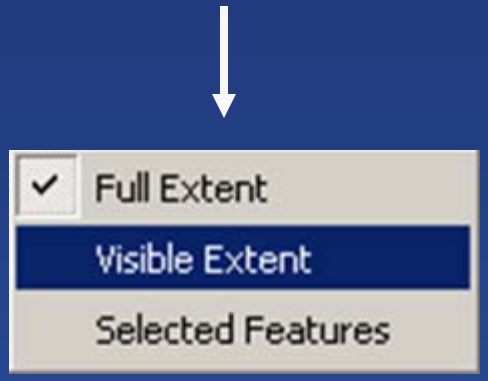
Error Inspector

! Topology is critical for data quality and integrity !

QC Toolbar
Coming soon in Version 1.1.18



Extent Selection



Find And Fix Inspector

Finds Minimum Sized Polygons

Finds Common Lines

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

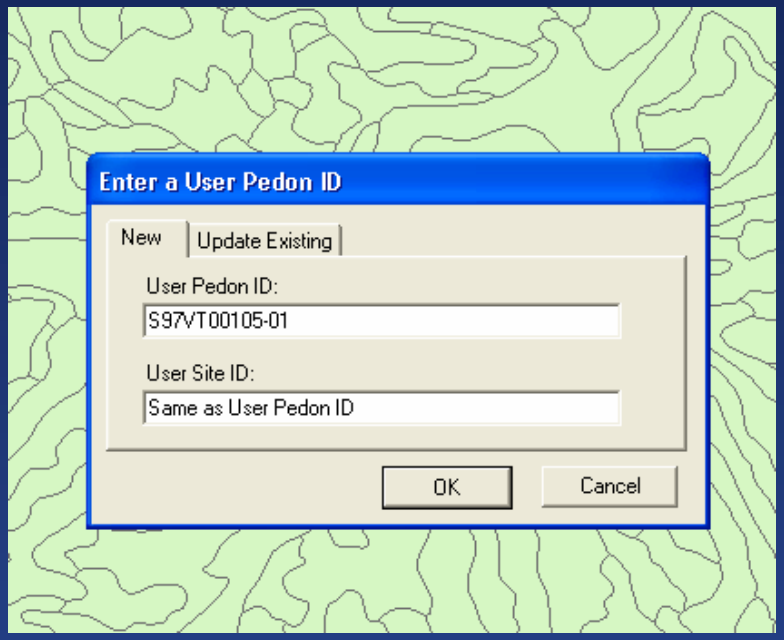
Information On GPS Receiver

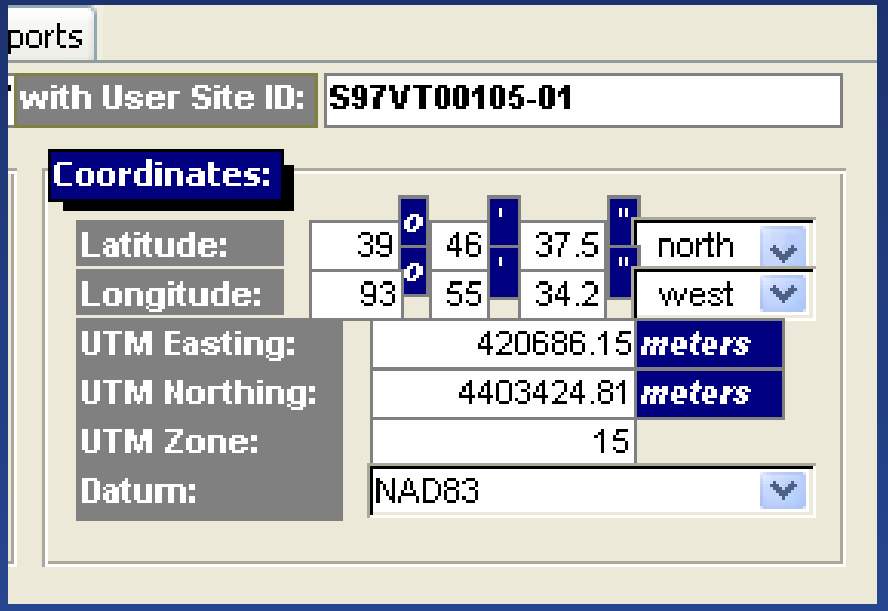
Navigation Using GPS

Collect Point

Close Connection

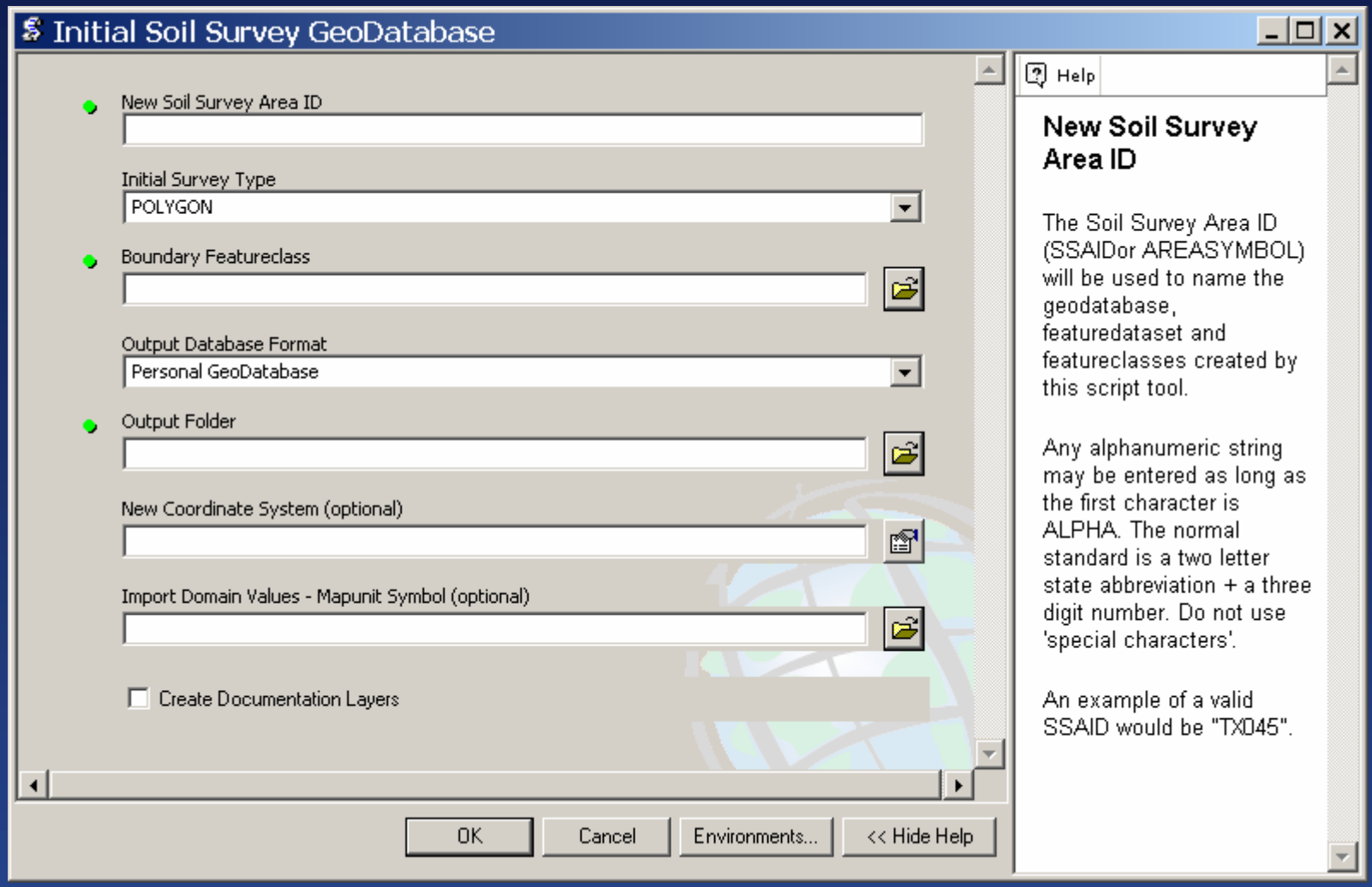
Autopopulation of Location

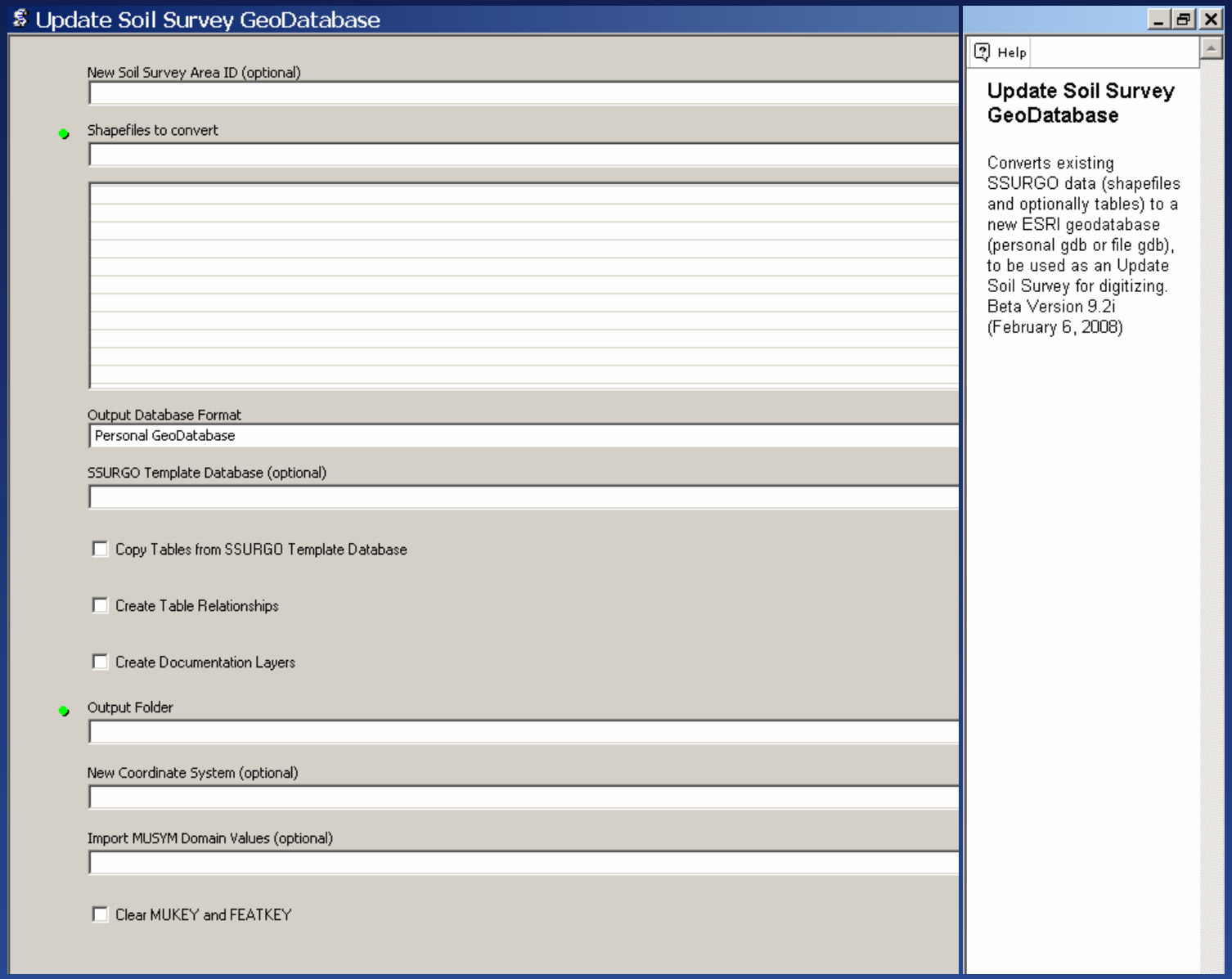




Setup Tools

- 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

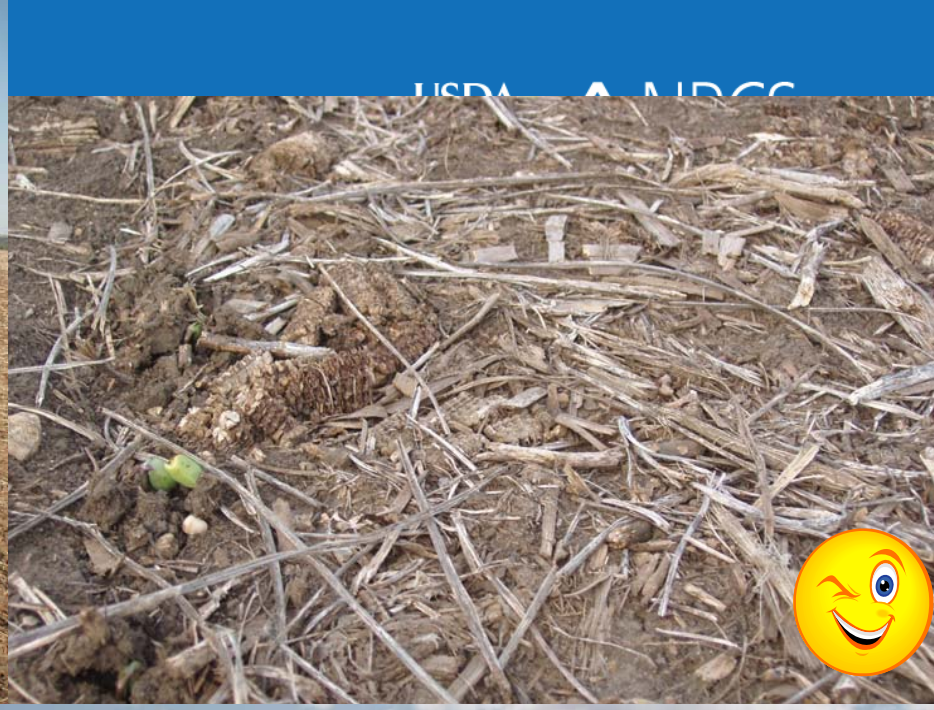

Initial Soil Survey GeoDatabase
New Soil Survey Area ID
Initial Survey Type
POLYGON
Boundary Featureclass
Output Database Format
Personal GeoDatabase
Output Folder
New Coordinate System (optional)
Import Domain Values - Mapunit Symbol (optional)
Create Documentation Layers
OK
Cancel
Environments...
<< Hide Help
Help
New Soil Survey Area ID
The Soil Survey Area ID (SSAIDor 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 SSAID would be "TX045".


Update Soil Survey GeoDatabase
New Soil Survey Area ID (optional)
Shapefiles to convert
Output Database Format
Personal GeoDatabase
SSURGO Template Database (optional)
Copy Tables from SSURGO Template Database
Create Table Relationships
Create Documentation Layers
Output Folder
New Coordinate System (optional)
Import MUSYM Domain Values (optional)
Clear MUKEY and FEATKEY
Help
Update Soil Survey GeoDatabase
Converts existing SSURGO data (shapefiles and optionally tables) to a new ESRI geodatabase (personal gdb or file gdb), to be used as an Update Soil Survey for digitizing.
Beta Version 9.2i
(February 6, 2008)

My Toolbar (in development):

Provides links to web and client applications that are relevant to soil science on a desktop toolbar

Questions?



1985

Soils with a lighter surface

1995

Soils with a darker surface

Read the magazine story to find out more.

Hills on the Skogstad family farm in western Minnesota have light-colored hilltops where topsoil has eroded and darker low spots where soil has been deposited.