United States Department of Agriculture
Natural Resources Conservation Service

USDA NRCS

Soil Business Area Analysis Group SBAAG

North Central Regional NCSS Conference
Lincoln, NE
June 5, 2012

Overview of SBAAG

Purpose

- Define an integrated soils information system.
- Develop and maintain the priority slate of projects.
- Serves as a management review body for analysis documents.
- Form ad-hoc teams to get input on specific business concerns.
- Develop draft requirements for applications.

Function

- Identify emerging agency soil data needs that may impact soil business.
- Ensure an integrated approach with other disciplines and technologies.
- Review issues, evaluate impacts, develop recommendations for the SSD leadership.

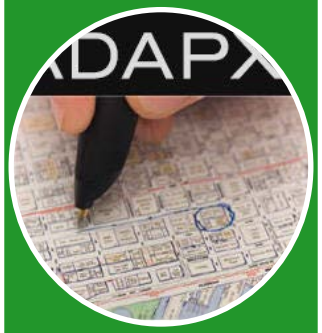
Organization

- *Executive Sponsor (1)*
  - SSD Director
- *Rotating Members (3)*
  - SSS
  - MO Leaders
- *Liaisons*
  - Ft. Collins ITC
  - NSSC
  - NGMC
- *Ad Hoc Advisory Members*
  - Specialists as needed
- *Advisors*
  - NRCS CIO
  - National Leaders (SSD, NSSC)

NCSS Topics of Interest

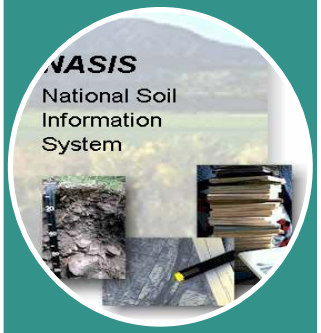
Annual refresh rate of official soil survey data

Development of gSSURGO



Technologies

- Adapx pen
- IOS
- Models



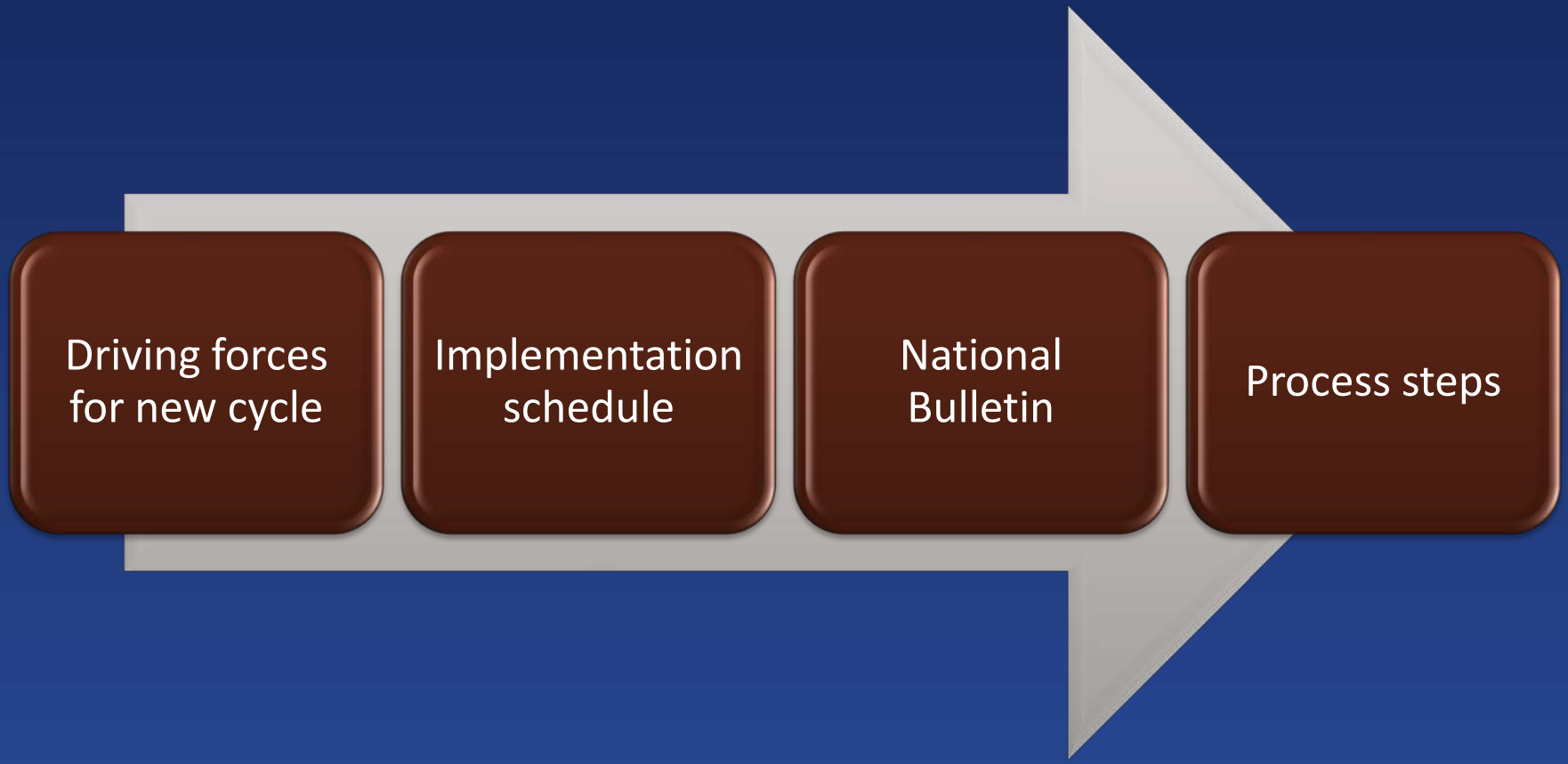
NASIS 6.2 & Pedon PC 5.0 release

Summer 2012

Web Soil Survey 3.0 release

Fall 2012

Annual Refresh Rate of Official Soil Survey Data



gSSURGO – Gridded SSURGO

Driving forces for new product

Our customers need more soil information, faster as a raster

Repackaged for large land areas (States & MO's)

Value Added Look Up (VALU) Table (with documented methods)

gSSURGO Package

Publicly available at NRCS Geospatial Gateway 2012
http://datagateway.nrcs.usda.gov

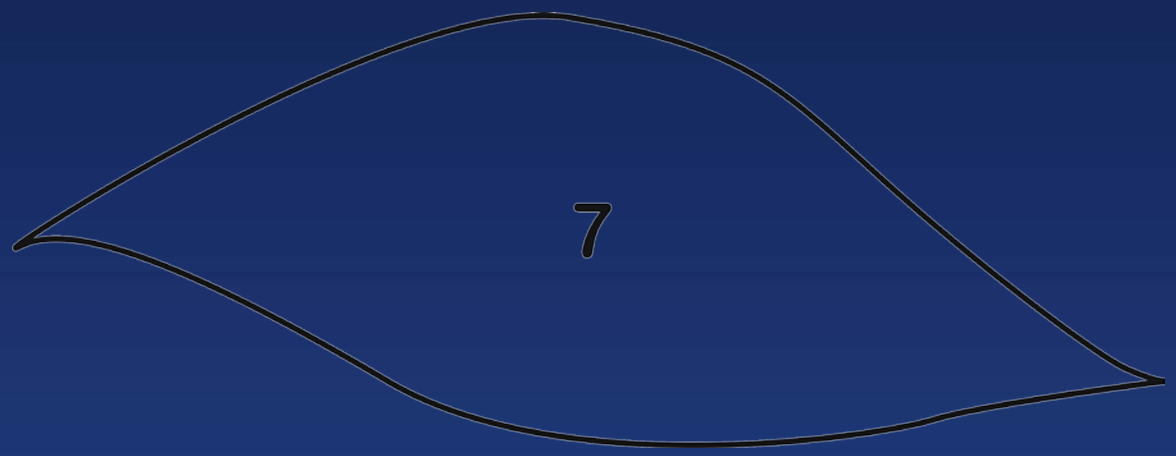
State-wide vector and 10 meter raster map unit key GIS layers (mupolygon and muRaster_10m) and tables

ArcGIS 9.2 File Geodatabase with pre-built relationship classes among many, hierarchical attribute tables

Pre-calculated or -summarized attributes in standard layers and zones in VALU Table e.g. Droughty Soil Landscapes

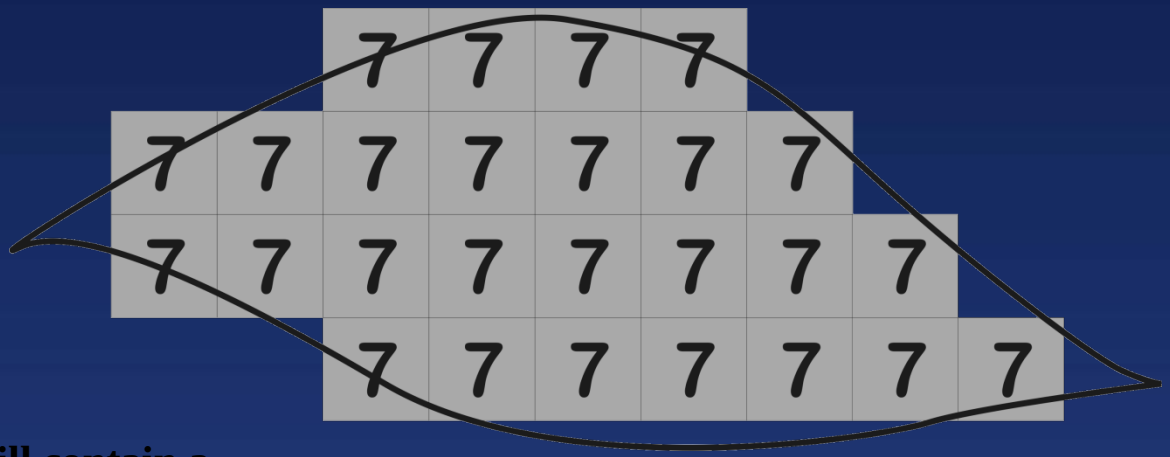
Planned SSURGO Package for Wetlands Mappers (includes 8 State-wide tables ready for MS Access import)

Soil Vector Model



The first 100 years of soil survey had an emphasis on delineating the soil polygon and then describing the range of soil types within that delineation

Soil Raster Generation 1



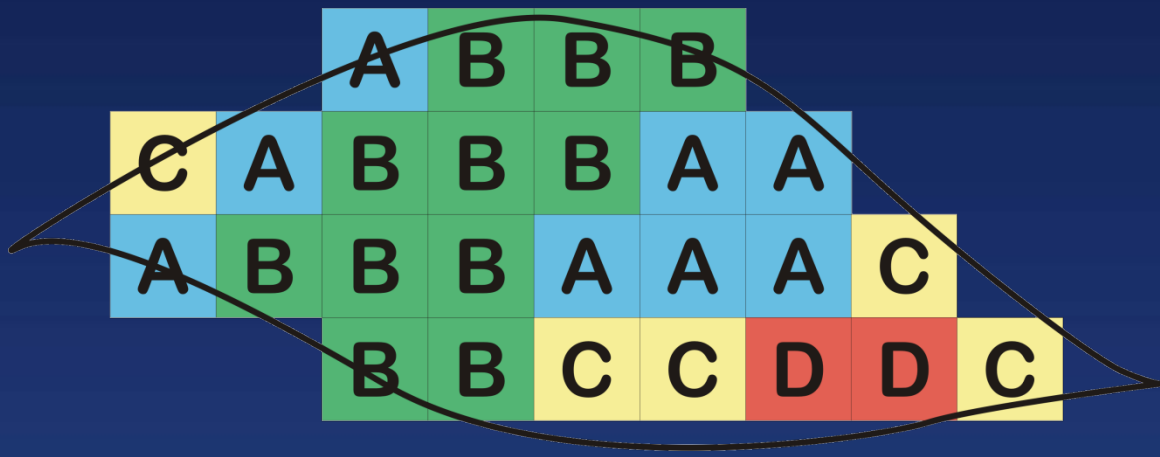
The first "gSSURGO" product will contain a set of 10m grids that will have the same map unit identifier as the vector polygons they formed from.

The raster map unit identifier will link to the same attribute databases as the SSURGO vector data.

The difference is that now the raster data can integrate better with other data sources such as satellite and elevation data and can also lead to improved soil and terrain modeling products

Soil Raster Generation 2

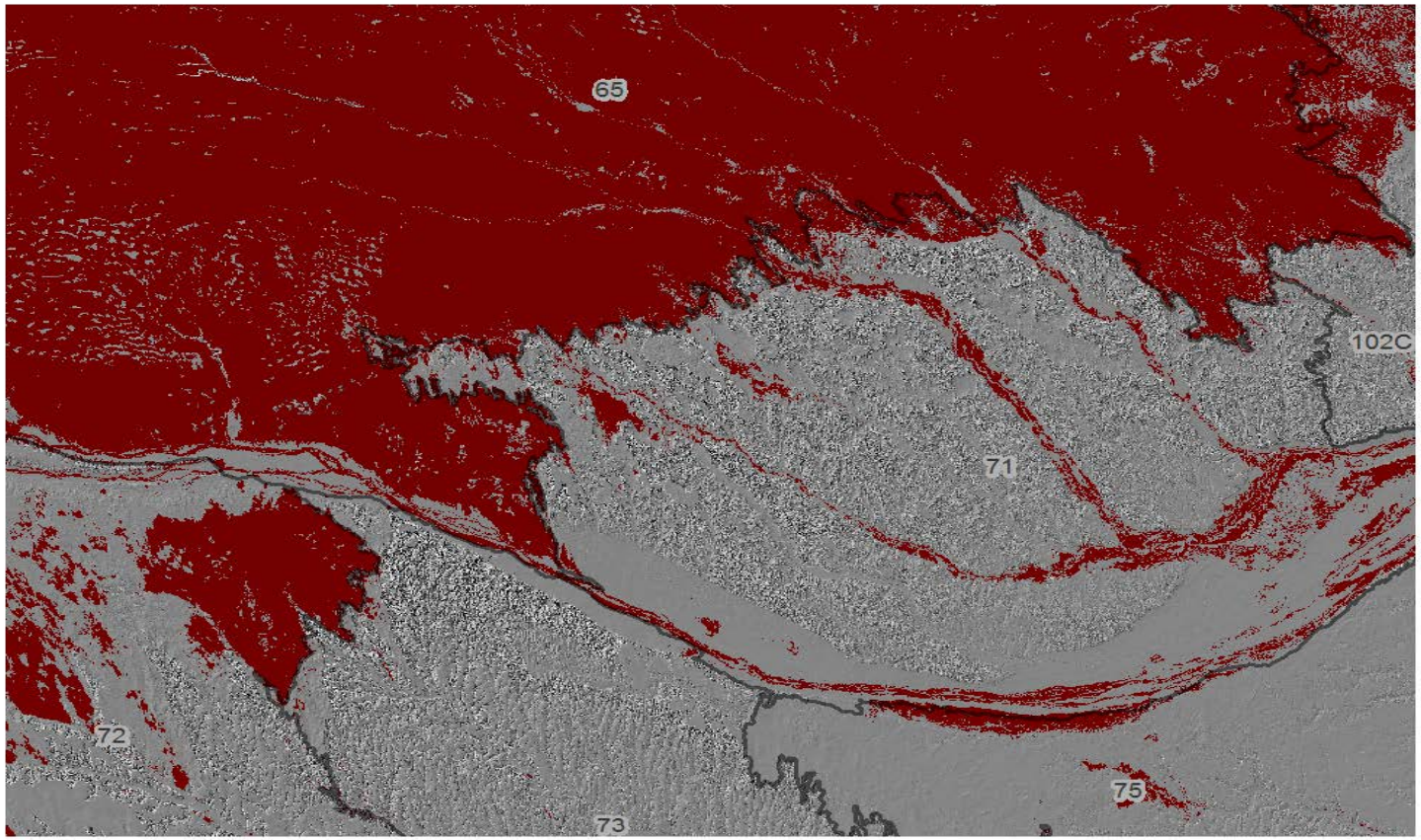
The second soil raster product will show the location of all types of soil within the original soil vector polygons



Locations of components are determined by geospatial analysis which is led by manuscript and tacit knowledge

Each raster cell has a “certainty” value associated with it as to how well it might fit the concept of that included soil

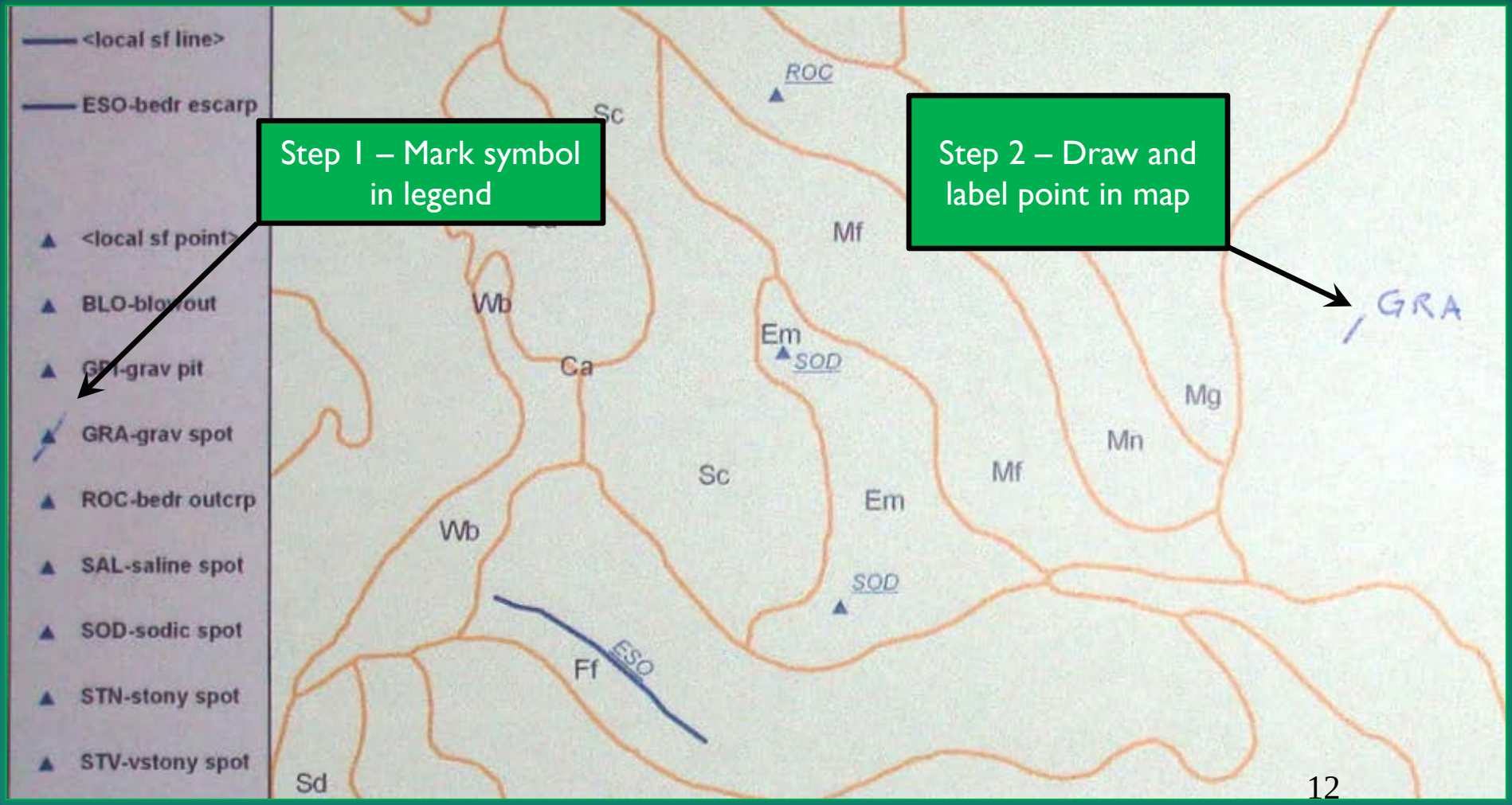
gSSURGO Value Added Look Up (VALU) Table:
e.g. Droughty Soil Landscapes – RZAWS <= 6” or 15.24cm

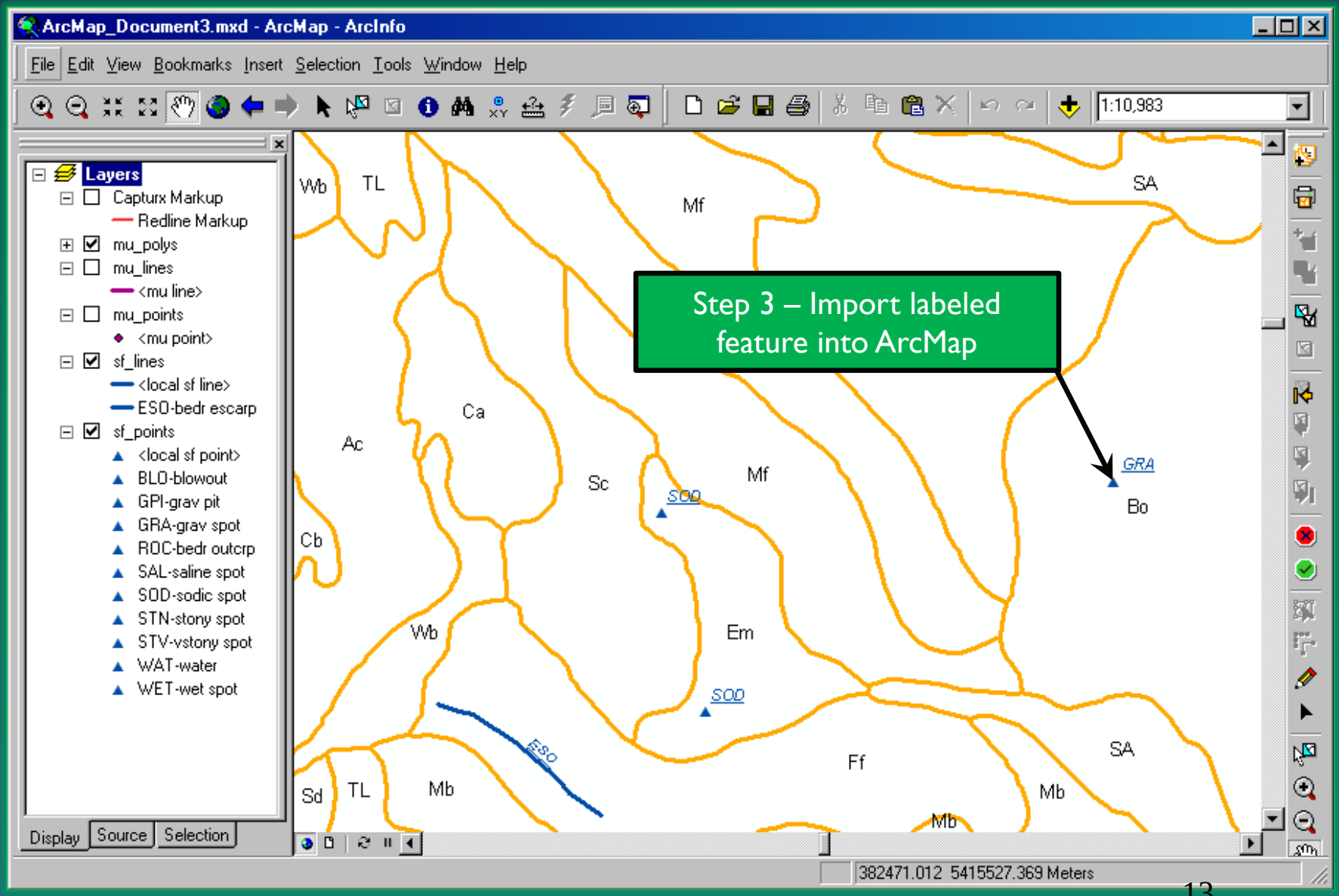


Adapx Pens and Capturx Software

- Pens purchased in 2011
- NSSC forms development
- SharePoint solution

Mapping Point Features





Step 3 – Import labeled feature into ArcMap

"The ArcGIS stuff is pretty cool but what I really want is the forms capability!"

RaCA	2.14	Field form -- PRINT with Capturx Print Tool					Plot Master -- pg. 1
Collector(s)	AKM, JRT, MJL, MDJ					Date	5/18/2011
User site id	C1303F03	MO Office	1st Char	Soil Grp ID	Landuse	Plot #	1st Char: C | F
Plot layout	Chain	MO13	C	1303	F	303	Landuse: C | F | P | W | X

LOCATION	RaCA site id	C1303F03	Offset azimuth	90°	Offset distance	500'

LATITUDE				LONGITUDE				
Degrees	Minutes	Seconds	Direction	Degrees	Minutes	Seconds	Direction	Datum
38	022	21.9	N	80	00	49.5	W	WGS84

EcoSite id					
EcoSite Name					
State id					
State name					
Phase id					
Phase name					
Land cover	Forest		Drained?	☐	
% bare soil	2	Distance to disturbance	25'	Disturbance type	Skid Trail
Plantation?	☐	Bedded?	☐	Stage	

Dominant species information				BAF	Nmbr In
Canopy position	Nat'l plant symbol	Local plant name	Order of Dominance	10	4
OVER		SUGAR MAPLE	1	First 4 'In' trees	
		BIRCH	2	DBH	Height
UNDER		STRIPE MAPLE	1		65'
					57
					45
					72

Codes -- enter terms in

Plot layout: CHA (c ... uster) | TRI (triangular)

Land cover: CROP ... cover)

Stage: EARLY (earl

Canopy position: O

Check boxes (Drained?

EcoSite Type				EcoSite State

Completed 'Plot Master' Field Form

RaCA	2.14	Field form -- PRINT with Capturx Print Tool					Plot Master -- pg. 1
Collector(s)	AAKMIJRT, MJL, MD 5					Date	5/18/2011
User site id	C1303E03	MO Office	1st Char	Soil Grp ID	Landuse	Plot #	1st Char: C | F
Plot layout	TRI	MO13	C	1303	F	03	Landuse: C | F | P | W | X

LOCATION	RaCA site id	C1303F03	Offset azimuth	900	Offset distance	5000

LATITUDE				LONGITUDE				
Degrees	Minutes	Seconds	Direction	Degrees	Minutes	Seconds	Direction	Datum
38	22	219.00	N	80	0	49.50	W	WGS84

EcoSite id					
EcoSite Name					
State id					
State name					
Phase id					
Phase name					
Land cover	Forest		Drained?	☐	
% bare soil	2	Distance to disturbance	250	Disturbance type	St: i D Trail
Plantation?	☐	Bedded?	☐	Stage	

Dominant species information				BAF	Nmbr In
Canopy position	Nat'l plant symbol	Local plant name	Order of Dominance	10	4
Over		SUGAR MA PLF	1	First 4 'In' trees	
		BIRCH	2	DBH	Height
Under		STRIP E MAPLE	8		650
					57
					4115
					72

Codes -- enter terms in

Plot layout: CHA (ch ... | TRI (triangular)

Land cover: CROP (c ...)

Stage: EARLY (early,

Canopy position: OV

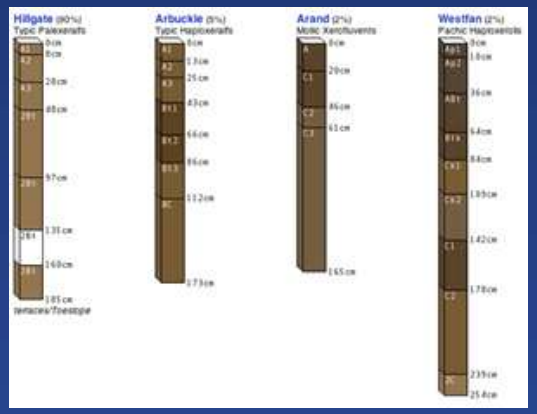
Check boxes (Drained?

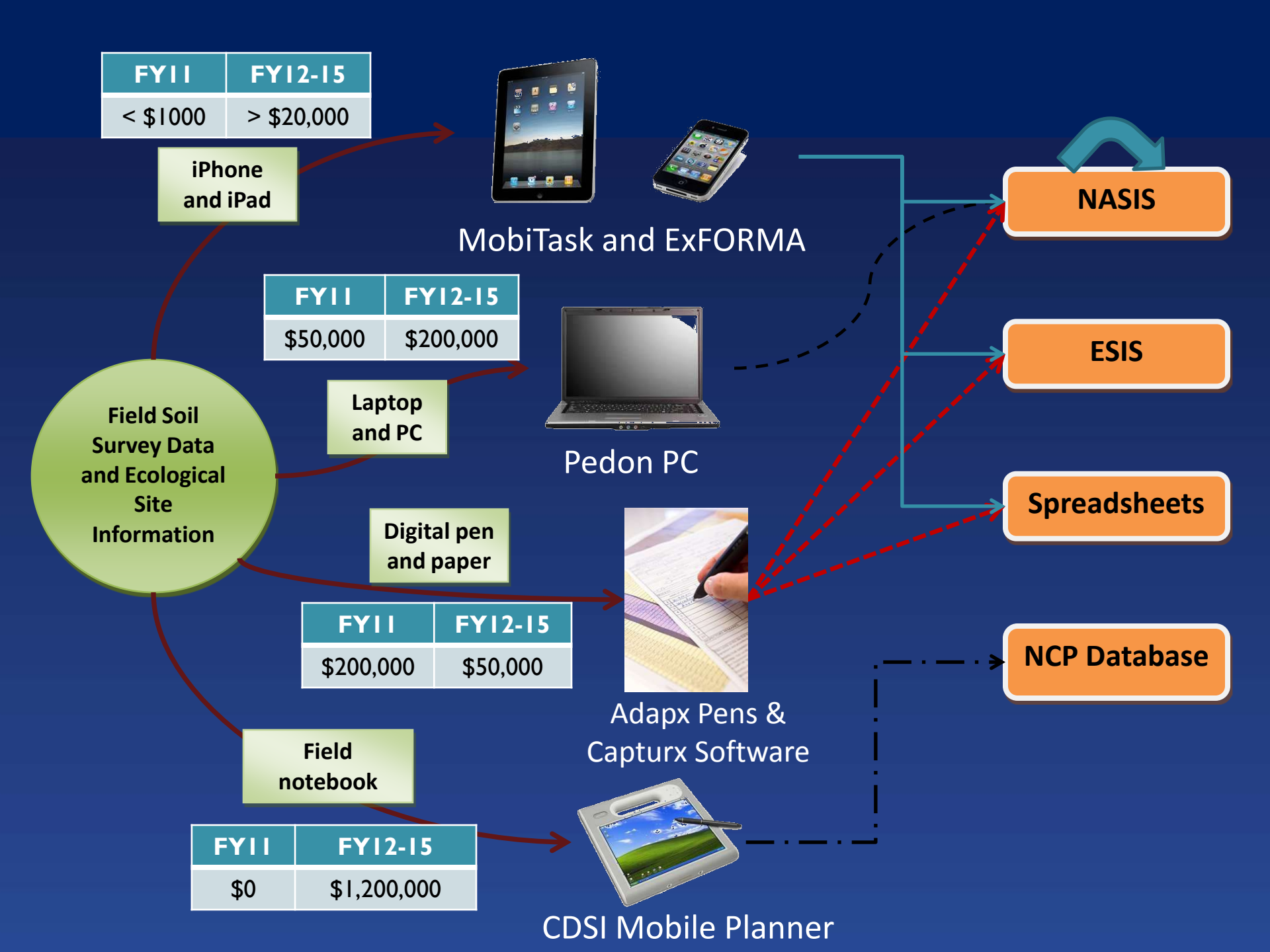
EcoSite Type				EcoSite State
F	177	Y	123	WV

'Plot Master' Worksheet with Imported Data

IOS Development

- Cooperative agreement with UC-Davis
- Work with eXFORMA and MobiTask




FY11
FY12-15
< $1000
> $20,000
iPhone and iPad
MobiTask and ExFORMA
FY11
FY12-15
$50,000
$200,000
Laptop and PC
Pedon PC
Field Soil Survey Data and Ecological Site Information
Digital pen and paper
FY11
FY12-15
$200,000
$50,000
Adapx Pens & Capturx Software
Field notebook
FY11
FY12-15
$0
$1,200,000
CDSI Mobile Planner
NASIS
ESIS
Spreadsheets
NCP Database

jNSM – Java Newhall Simulation Model

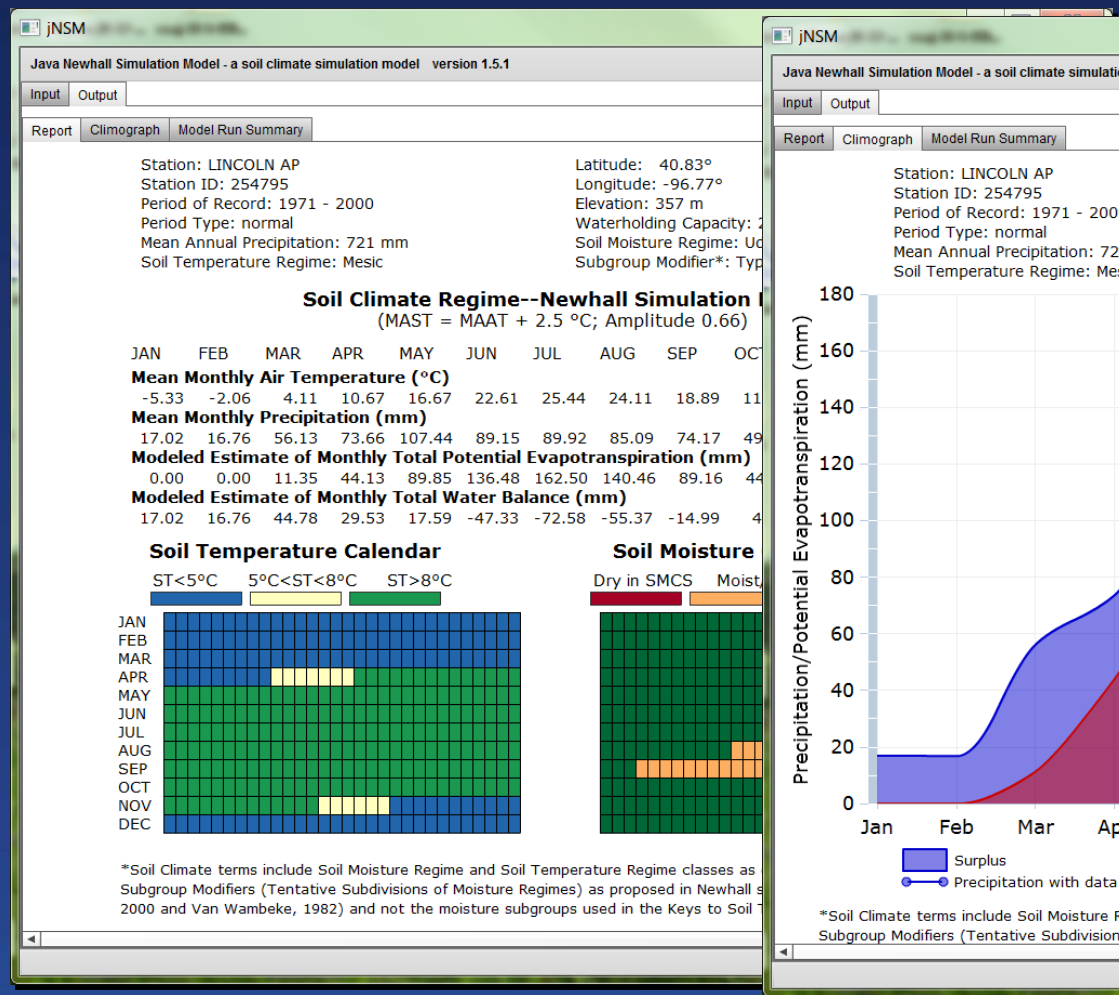
Needed better understanding of soil climate through time

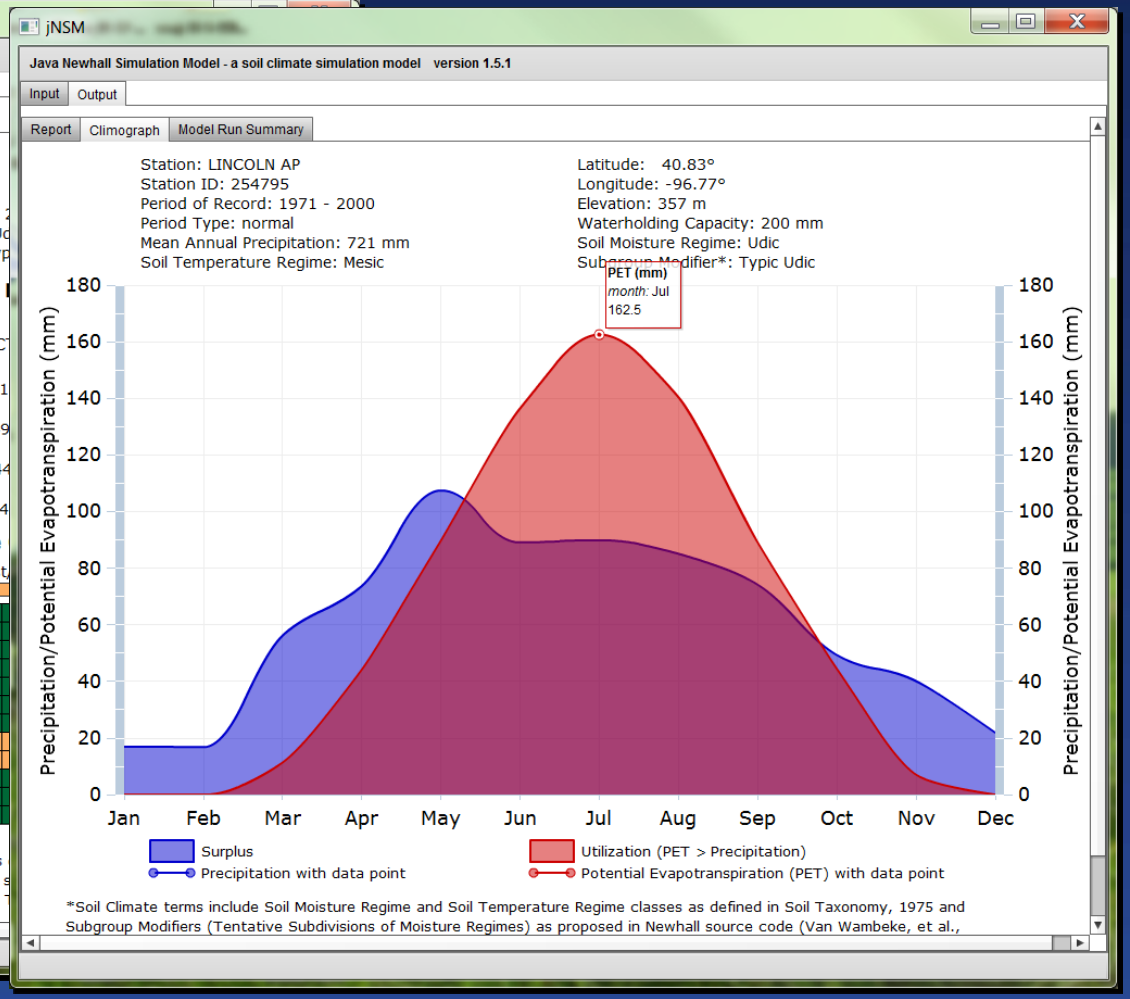
Traditional NSM model redone using JAVA with batch input tables

Uses weather, SCAN, or local soil climate monitoring stations – monthly air temp & precipitation

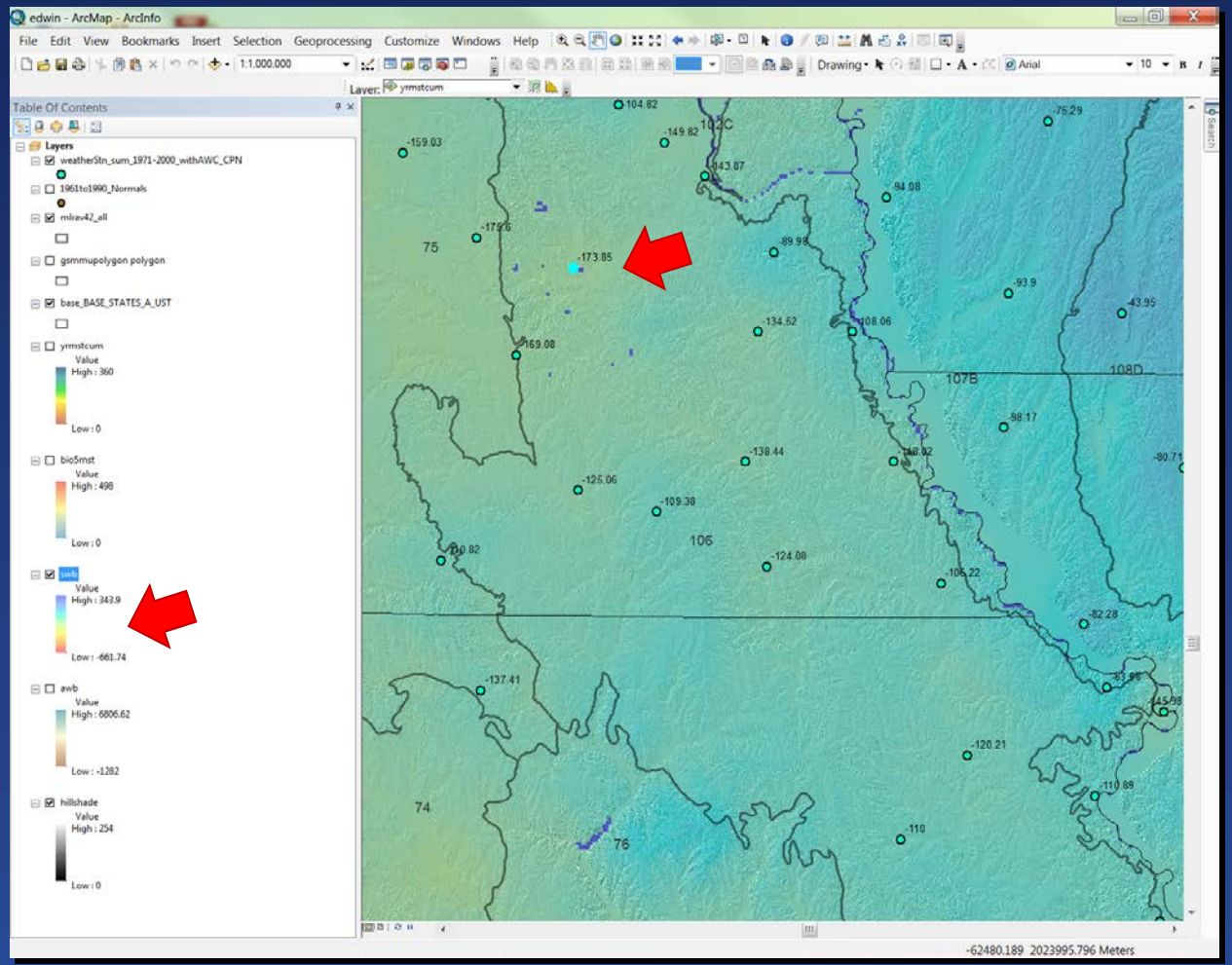
National Bulletin on CCE jNSM v1.5.1 release and Webinar and Website

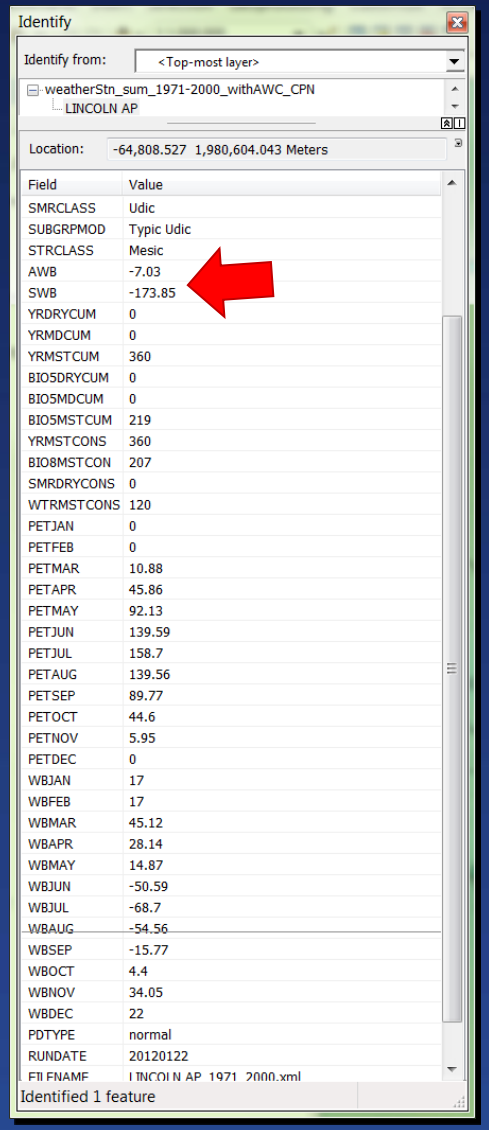
jNSM – Java Newhall Simulation Model





jNSM – 1971-2000 Summer Water Balance mm
Lincoln AP weather station plus
PRISM map surface 800 m (Winzeler, et al. 2012)



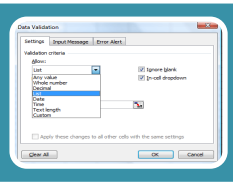


Field	Value
SMRCLASS	Udic
SUBGRPMOD	Typic Udic
STRCLASS	Mesic
AWB	-7.03
SWB	-173.85
YRDRYCUM	0
YRMDCUM	0
YRMSTCUM	360
BIO5DRYCUM	0
BIO5MDCUM	0
BIO5MSTCUM	219
YRMSTCONS	360
BIO8MSTCON	207
SMRDRYCONS	0
WTRMSTCONS	120
PETJAN	0
PETFEB	0
PETMAR	10.88
PETAPR	45.86
PETMAY	92.13
PETJUN	139.59
PETJUL	158.7
PETAUG	139.56
PETSEP	89.77
PETOCT	44.6
PETNOV	5.95
PETDEC	0
WBJAN	17
WBFEB	17
WBMAR	45.12
WBAPR	28.14
WBMAY	14.87
WBJUN	-50.59
WBJUL	-68.7
WBAUG	-54.56
WBSEP	-15.77
WBOCT	4.4
WBNOV	34.05
WBDEC	22
PDTYPE	normal
RUNDATE	20120122
FILENAME	LINCOLN AP_1971_2000.xml

NASIS 6.2 Features

a number of bug fixes

performance enhancements



user customizable choice lists similar to those in Pedon PC

enhancements to the spreadsheet import process

import of GPS coordinates

NASIS 6.2 Features

many new tables and columns in the Pedon/Site data structure to accommodate data gathered from…

- SSO mini-labs
- Infiltration tests
- Ksat tests
- Soil temperature and moisture data
- IRIS tube data

NASIS 6.2 Features

Some rearrangement of columns between tables.

Adding a Pedon Taxonomic History table to allow tracking of classification changes for a pedon through time. This accounts for the data formerly submitted on Soil-8 forms.

An updated pedon import routine to match updated Pedon PC.

Will be compatible with Windows 7 OS and SQL Server Express 2008.

NASIS 6.2 Features

Incorporation of Soil Classification (SC) database into NASIS.

This will allow use of the SC database as a lookup of series names to be used for Components and Pedons	The ability to import the classification of a series into the component and pedon Soil Taxonomy fields.	These data tables will be viewable in NASIS but <u>not</u> editable via the NASIS interface. Editing will only done with the SC/OSD Maintenance Tool.	The OSD files themselves will <u>NOT</u> be included in NASIS.

NASIS 6.2 Features

Improved component selection in the Export dialog box – similar to what was in NASIS 5.x.

Much improved capability to fine tune the contents of the local database by controlling which data objects get downloaded from national to local db.

Ability to remove individual objects from the local database.

Pedon PC 5.0 Features

Migration to ACCESS 2007 and .accdb file format.

With this release we will no longer support the .mdb file format

Many but not all of the additional tables and columns listed above that are being added to NASIS 6.2

We also added columns and tables that have been added to Site/Pedon tables in NASIS since 2002 that have never been added to Pedon PC

NCSS Database

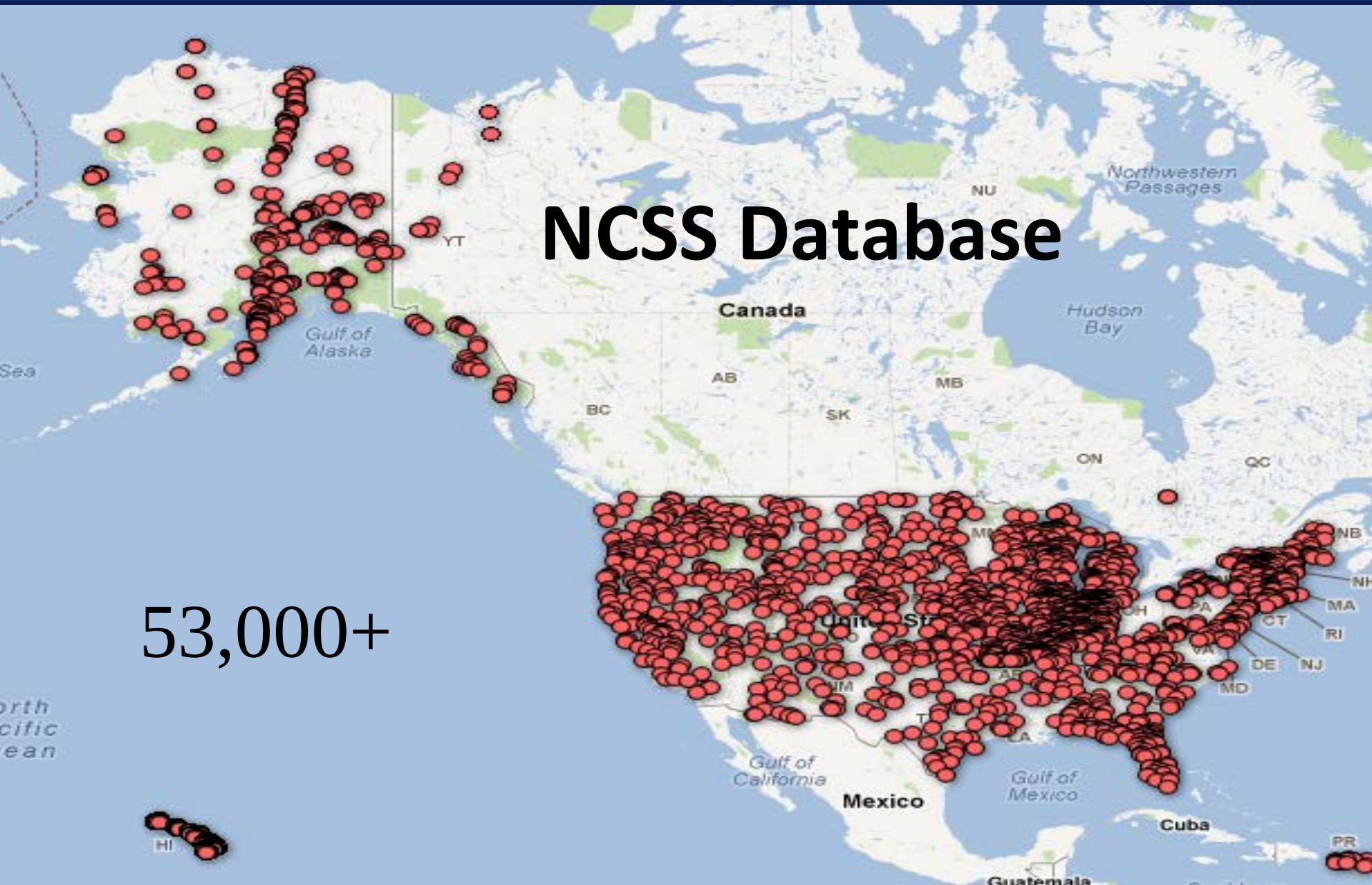
Laboratory data from universities for more than 20,000 pedons have been added to the database.

Tables in the NCSS database that duplicate NASIS will no longer be used.

The most recent classification will be delivered along with the most recent profile description.

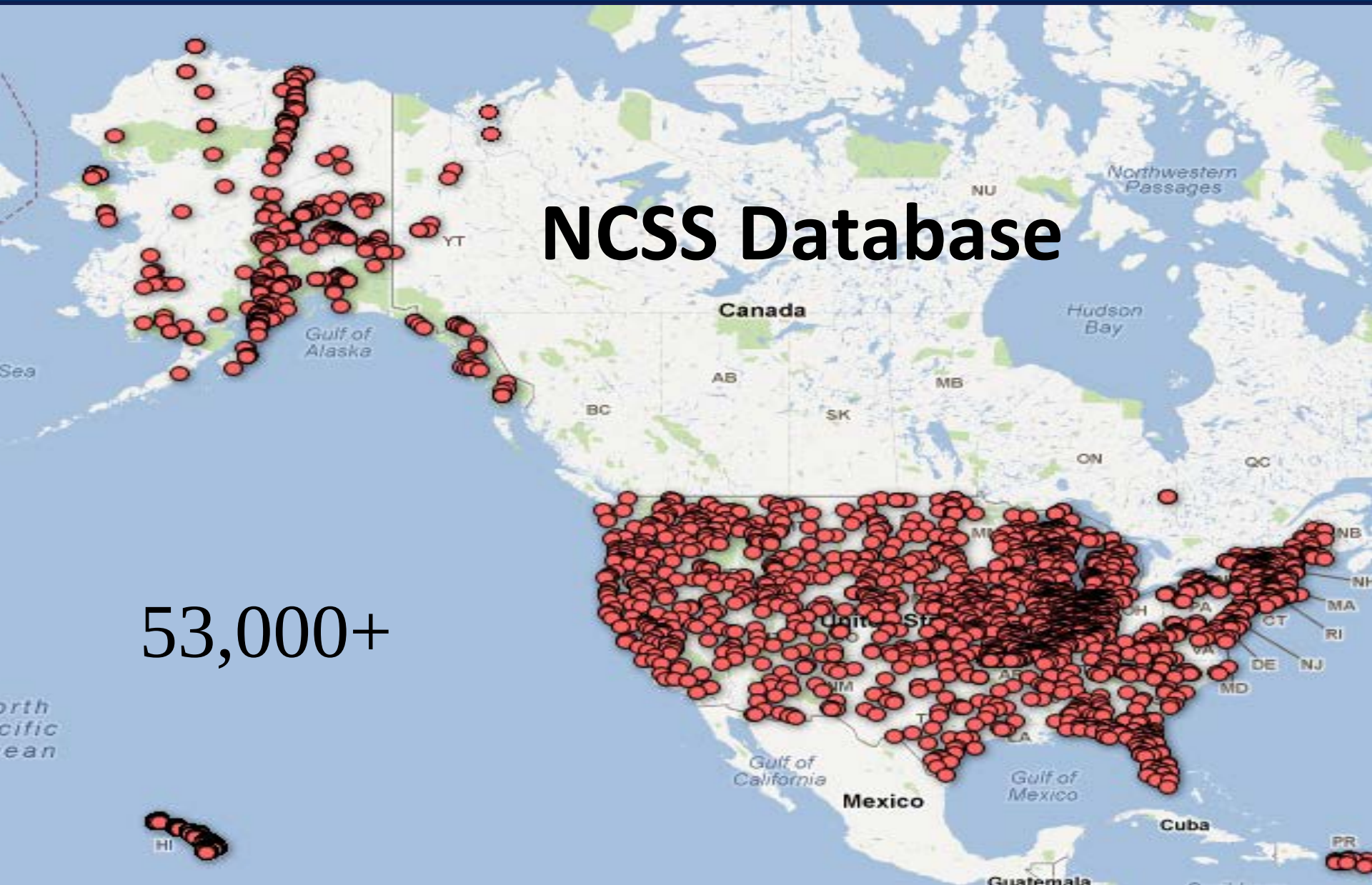
The Web interface is the most commonly used product. ACCESS databases of the laboratory data may be requested through the National Soil Survey Center.

NCSS Database

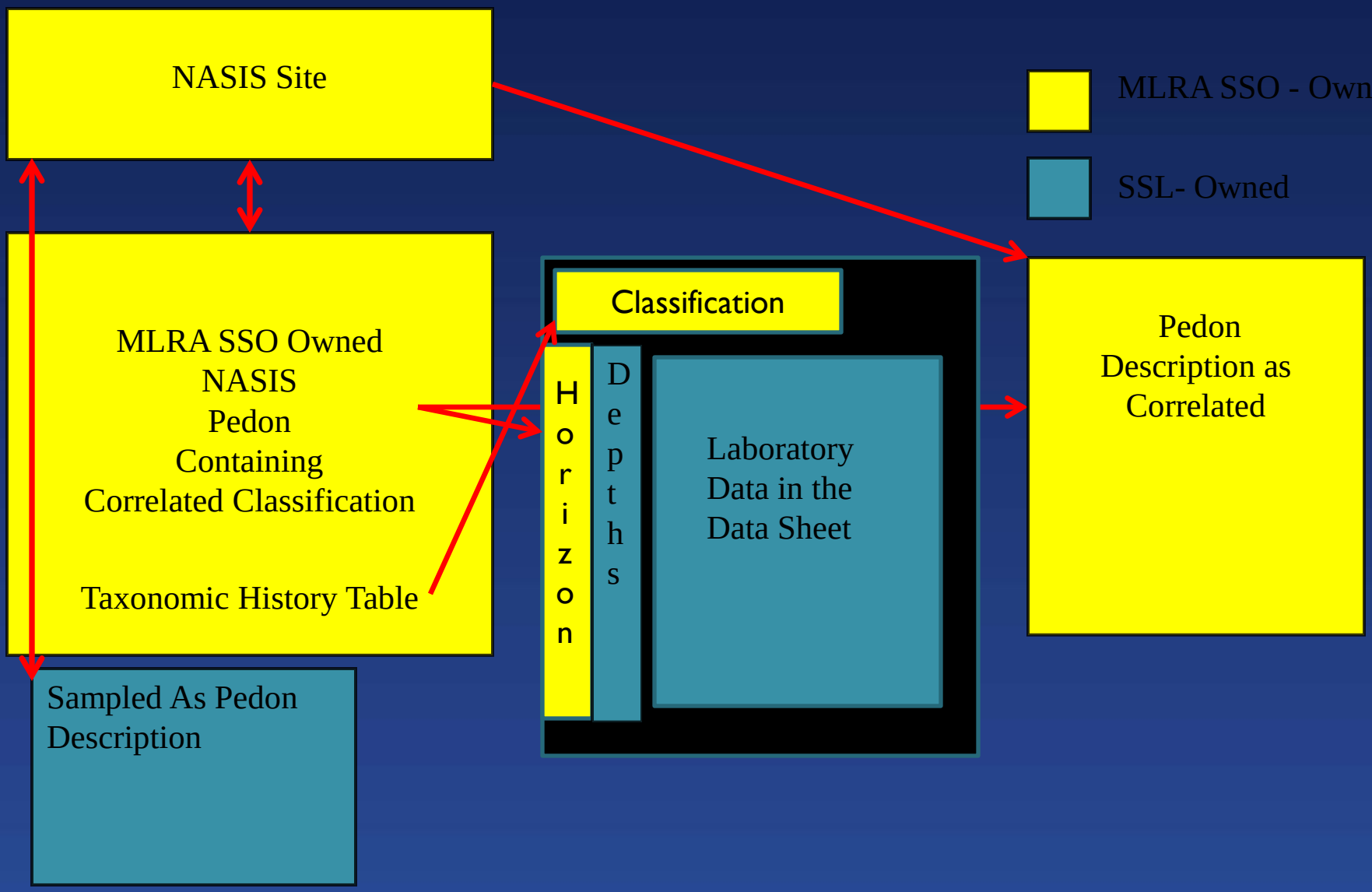


53,000+

NCSS Database



53,000+


NASIS Site
MLRA SSO - Owned
SSL- Owned
MLRA SSO Owned
NASIS
Pedon
Containing
Correlated Classification
Taxonomic History Table
Classification
Horizon
Depths
Laboratory
Data in the
Data Sheet
Pedon
Description as
Correlated
Sampled As Pedon
Description

Point Data Collection for the Future

- Migrate Pedon PC and Pedon PC Plus features into NASIS
- Evaluate the use of Digital Pen Technology
- Migrate Ecological Site data into NASIS
- Develop/migrate forms based data entry capability for ecological site data

WSS 3.0 Features

Totally redesigned backend application and database

- Will utilize SQL Server 2008 dbms and other software instead of current ESRI tools.
- Will streamline the server configuration resulting in fewer servers being needed – big cost savings
- Much improved performance and reliability
- Will allow for significant increase in size limit of AOI

WSS 3.0 Features

Current report generation and data download functions in SDM will be migrated to WSS

SDM application will be shut down

eFOTG links to be migrated from SDM to WSS as much as possible

Will utilize color imagery from bing instead of our NAIP imagery.

WSS 3.0 Features

Will have some ability for user to modify colors and/or width of line work and fonts on the maps.

Hope to have updated navigational data layers – hydrography, roads, etc.

Updated Federal land boundaries as available.

Will accommodate line and point map units.

SDM database will be converted to WGS 84

This will allow for the inclusion of Pacific Island Area datasets