

Understanding National Park Service Soil Survey Needs



Park 1





NPS as a NCSSS cooperator



- Soil mapping is part of the DOI Natural Resource Challenge – it's a one time deal
- Funding ~\$2.5 - 3.0 Million/year for new mapping. Funding until the work is done – again, it's a one shot deal. NPS will not have designated funds for updating
- 32 park projects in 10 states

NPS Soil Resource Inventory Staff



Park 2

Pete Biggam - Soils Program Manager

**Judy Daniels - CSU as SRI Data
Manager**

Branon Barrett – UCD GIS Specialist

Troy Kashon – UCD GIS Specialist

Sue Southard – NRCS/NPS Liaison

Premise we want to work under



Park 3

- Promoting the use of soils information means making it accessible in a user friendly way
- This also promotes the profession

Facts we have to acknowledge

NPS Parks have...

- no resource soil scientists
- no soil scientists on staff (except Pete and me)
- very few GIS specialists - most have none
- no plotters
- very limited financial resources
- no infrastructure for training in soils and existing GIS staff is spread thin

What does the NPS want for soil survey deliverables?

1. Set up of the NPS lands as a non-MLRA soil survey area
2. SSURGO mapunit/dmu data as well as pedon and site data in NASIS
3. Emphasis on how soils fit within the park ecosystems

What does the NPS want for soil survey deliverables?

4. What's so cool about this park's soil?
5. Consistent SSURGO exports including local and standard interpretations
6. For all parks, even if mapped already, completion of NPS System Lands map unit overlaps in NASIS

1. Setting up parks as non-mlra soils survey areas

SDM, SDV, WSS are based on state-based delivery of non-mlra soil survey areas

If the park is set up as a non-mlra soil survey area the whole delivery of data to the park is made easier



1. Setting up parks as non-mlra soils survey areas

- If you need help in the process call me but first consult the NSSH Section 608.03
- Pete Biggam will supply the boundary to use
DON'T USE ANY OTHER SOURCE!!
- Be sure the boundary from Pete has metadata with the date and source documented by NPS

(A few handouts provided for those who need it)



Boundary issues abound!

Jurisdictional, deeded, management and administrative – types of boundaries

Example: Big South Fork National Reserve and Recreation Area has a state forest in the middle- all is managed as NPS lands

Don't digitize the park boundary beyond its established area



2. Map unit as well as pedon and site data in NASIS

Type locations, lab data, road cut observations that all may be used by NPS interpretive staff

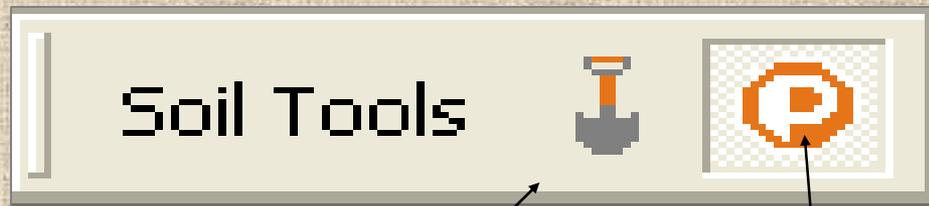
Why point data?

Example from LAVO archeologist.....

What is needed is not a point on a map but the DATA associated with the point

Identity Tools

NPS is developing an ArcGIS Desktop toolset that geospatially links soils data allowing users to access soils data in an interactive manner. Focus is on the map unit descriptions, pedon point data, and ecological site descriptions. The current toolset includes a Map Unit Identify Tool and a Pedon Identify Tool.

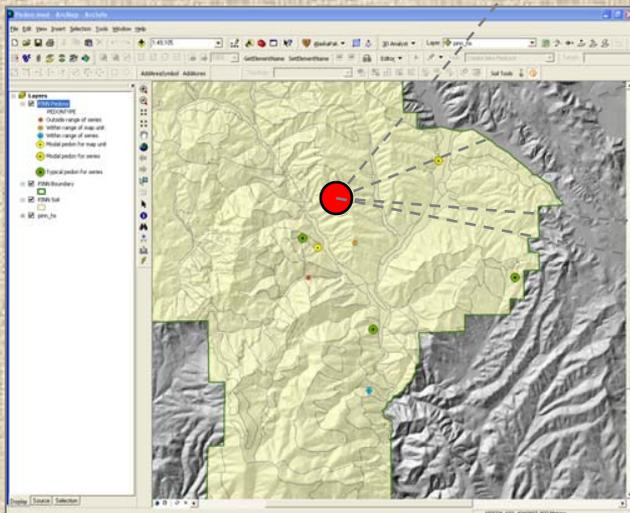


Map Unit Identify
Tool

Pedon Identify
Tool

Pedon Identity Tool

With Pedon Identify Tool the user selects a pedon point using the Pedon Identity Tool. All site and pedon information including a full pedon description is displayed

A screenshot of a web browser displaying the 'Soil Pedon Description' page for PINN015. The page has a blue header and a white body. On the left, there is a 'Contents' sidebar with a tree view showing 'Pedon Descriptions' and a list of pedon IDs including PINN001, PINN015, PINN018, PINN023, PINN026, PINN074, PINN109, PINN252, PINN254, and S05CA069010. The main content area displays the following information:

Soil Pedon Description
Pinnacles National Monument, California

Soil Name as Correlated:
Passion

Soil Classification:
Sandy-skeletal, mixed, thermic, shallow Typic Xerorthents

Soil Name as Originally Described and/or Sampled:
Passion

Report Print Date:
02/08/2008

Description Date:
01/19/2005

Describer(s):
Ken Oster and Valerie Bullard

User Site ID:
PINN015

User Pedon ID:
PINN015

Soil Pedon Description



Hide



Back



Forward



Home



Print



Options

Contents

Search

Favorites

[-] Pedon Descriptions

[?] Error: There is no Pedon help file for this point

[-] PINN - Pinnacles National Monument

[?] PINN001

[?] PINN015

[?] PINN018

[?] PINN023

[?] PINN026

[?] PINN074

[?] PINN109

[?] PINN252

[?] PINN254

[?] S05CA069010

Pedon Type: typical pedon for series

Pedon Kind: series

Pedon Purpose: full pedon description

Location Information:

County: San Benito

USGS 7.5 Minute Quad Number and Name: 36121-D2 North Chalone Peak, California

State: California

Major Land Resource Area Symbol and Name: 15 -- Central California Coast Range

Soil Survey Area:

PINN -- Pinnacles National Monument

CA069 -- San Benito County, California

Map Unit:

100 -- ORDEAL-PASSION ASSOCIATION, 9 TO 50 PERCENT SLOPES

- [-] Pedon Descriptions
 - [?] Error: There is no Pedon help file for this point
 - [-] PINN - Pinnacles National Monument
 - [?] PINN001
 - [?] PINN015
 - [?] PINN018
 - [?] PINN023
 - [?] PINN026
 - [?] PINN074
 - [?] PINN109
 - [?] PINN252
 - [?] PINN254
 - [?] S05CA069010

Location Description:

780 meters east of the Chalone Creek Maintenance Station

Legal Description:

625 meters east and 370 meters north of the southwest corner Section 36, Township 16S, Range 7E MOUNT DIABLO Meridian
Latitude: 36 degrees 30 minutes 0.60 seconds north
Longitude: 121 degrees 9 minutes 59.30 seconds west
Datum: NAD83
Coordinates: 10 UTM Easting: 664214 meters, UTM Northing: 4040996 meters

Physiographic Division: Pacific Mountain
Physiographic Province: Pacific Border Province
Physiographic Section: California Coast Ranges
Local Geologic Formation: Temblor
Parent Material: residuum weathered from conglomerate
Bedrock Kind: conglomerate
Bedrock Depth: 16 inches (41.0 cm)

Geomorphic Setting: crest
Upslope Shape: convex
Cross Slope Shape: linear
Slope Gradient: 10.0 percent Slope Aspect: 165 (deg)
Elevation: 1654 feet, 504.0 meters
Mean annual precipitation: inches
Mean annual air temperature (F):
Frost-free days: days

Ecological Site Number and Name:

Primary Earth Cover: Shrub cover
 Secondary Earth Cover: Native shrubs

Surface Fragments (% area covered):

20 percent 2 to 75 millimeter and 10 percent 76 to 250 millimeter

Particle Size Control Section:

9.8 to 16 in. (25 to 41 cm)

Diagnostic Features:

Kind	Top Depth (in)	Bottom Depth (in)	Top Depth (in)	Bottom Depth (cm)	Bottom Depth (cm)
Ochric Epipedon	0	7	0	18	
Paralithic Contact	16		41		

Pedon Restrictive Features:

Kind	Top Depth (in)	Bottom Depth (in)	Top Depth (cm)	Bottom Depth (cm)
Bedrock, Paralithic	16		41	

Field Measured Properties:**Pedon Notes:**

A1--0 to 3 inches, (0 to 8 cm); grayish brown (10YR 5/2) loamy sand, very dark grayish brown (10YR 3/2) moist; 5 percent clay; weak fine subangular blocky structure, soft, friable, slightly sticky, nonplastic; many very fine roots throughout; many very fine irregular pores; 10 percent 2 to 5 millimeter; slightly acid, pH 6.5 ; clear wavy boundary.

A2--3 to 7 inches, (8 to 18 cm); brown (10YR 5/3) gravelly loamy sand, brown (10YR 4/3) moist; 5 percent clay; weak fine subangular blocky structure, soft, very friable, slightly sticky, nonplastic; many very fine roots throughout; many very fine irregular pores; 5 percent 2 to 5 millimeter and 10 percent 20 to 75 millimeter and 10 percent 5 to 20 millimeter; neutral, pH 7.0 ; clear wavy boundary.

C--7 to 16 inches, (18 to 41 cm); light yellowish brown (10YR 6/4) very gravelly loamy sand, dark yellowish brown (10YR 4/4) moist; 5 percent clay; weak fine subangular blocky structure, slightly hard, very friable, nonsticky, nonplastic; many very fine roots throughout; many very fine irregular pores; 5 percent 5 to 20 millimeter and 15 percent 76 to 250 millimeter and 20 percent 2 to 5 millimeter; neutral, pH 7.0 ; clear wavy boundary.

Cr--16 to 61 inches, (41 to 155 cm); very gravelly loamy sand; HORIZON NOTE: Soft, massive conglomerate.

What do you have to do?

- Don't worry...just get pedon/site data in NASIS
- Send me the final pedon list using NASIS report **“NPS DATA DUMP – Pedon and Site List Info for Deliverables”**
- I'll do the export of data in the format the park needs – I just need a list of your pedons in the park

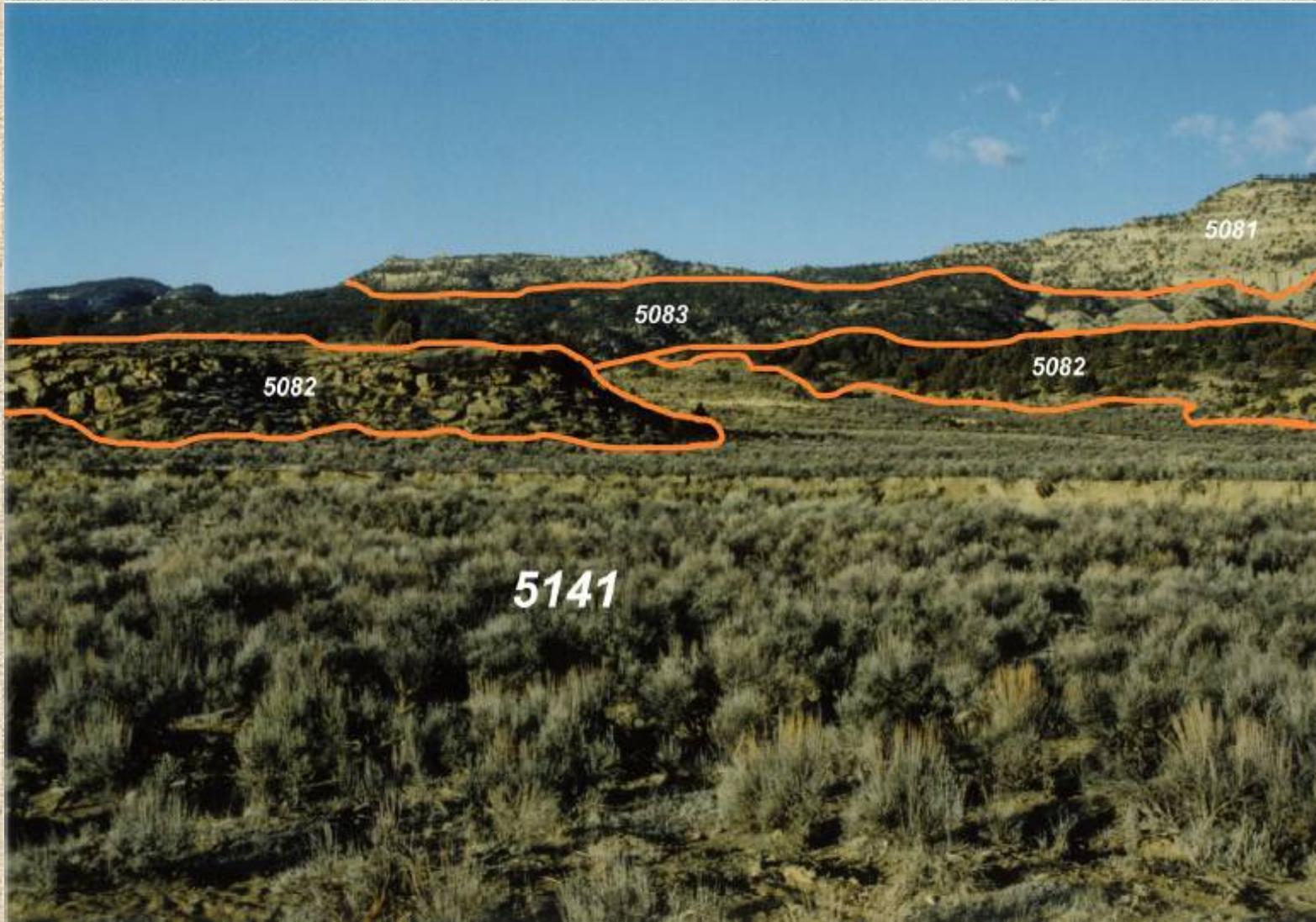
What do you have to do?

- ✓ When providing photos name them by their user site id in NASIS
- ✓ P pedon; v for veg; l for landscape – possible scenario for labeling
- ✓ Soil names often change – don't use in file name
- ✓ Local naming conventions often don't mean anything to anyone else but User Site ID does since it is a unique in the database





Photo map units





An aside.....

- For 100 years we've been making soil descriptions and many are lost
- NASIS allows us to preserve and protect these observations
- Recently a fire in a field office destroyed all soils observations. They were lost because they were not in NASIS



Park 4

3. Emphasis on how soils fit within the parks ecosystems



Completed ESDs - where funded

Photos of map unit with representative vegetation



Block diagrams

GSM with soil formation theme

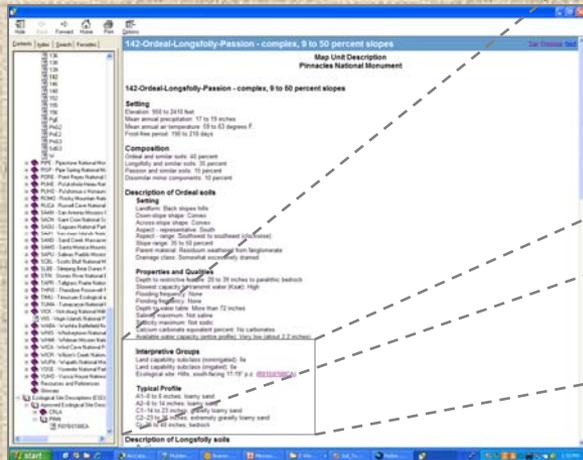
Park 5

ESD links on desktop

From the pedon description or map unit description, the ESD can be accessed via a hyperlink if...

1. there is a NRCS approved ESD Report for that map unit and
2. ESD info is populated in NASIS (every major and hydric minors components)
and in pedon tables)

ESD hyperlink



Interpretive Groups

Land capability subclass (nonirrigated): 6e

Land capability subclass (irrigated): 6e

Ecological site: Hills, south-facing 17-19" p.z. ([R015X1100CA](#))

Typical Profile

A1-0 to 6 inches; loamy sand

A2-6 to 14 inches; loamy sand

C1-14 to 23 inches; gravelly loamy sand

C2-23 to 36 inches; extremely gravelly loamy sand

Cr-36 to 40 inches; bedrock

ESD Hyperlink

**UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE**

ECOLOGICAL SITE DESCRIPTION

ECOLOGICAL SITE CHARACTERISTICS

Site Type: Rangeland

Site Name: Hills, south-facing 17-19° p.z.

Adenostoma fasciculatum - Ceanothus cuneatus
(/ chamise - buckbrush /)

Site ID: R015X1100CA

Major Land Resource Area: 015 - Central California Coast Range

Physiographic Features

-

This ecological site is located on hills with slopes ranging from 2 to 75% at elevations from 984 to 2998 feet, and is found primarily on south-facing slopes.

Land Form:

(1)	Hill
(2)	Terrace

Elevation (feet): Minimum: 984, Maximum: 2998

Slope (percent): Minimum: 2, Maximum: 75

Water Table Depth (inches):

Flooding:

Frequency: None

Duration: None

Layers:

- PNNI Pedons
- PEDONTYPE
 - Outside range of series
 - Within range of map unit
 - Within range of series
 - Modal pedon for map unit
 - Modal pedon for series
 - Typical pedon for series
- PNNI Boundary
- PNNI Soil
- pinn_hs

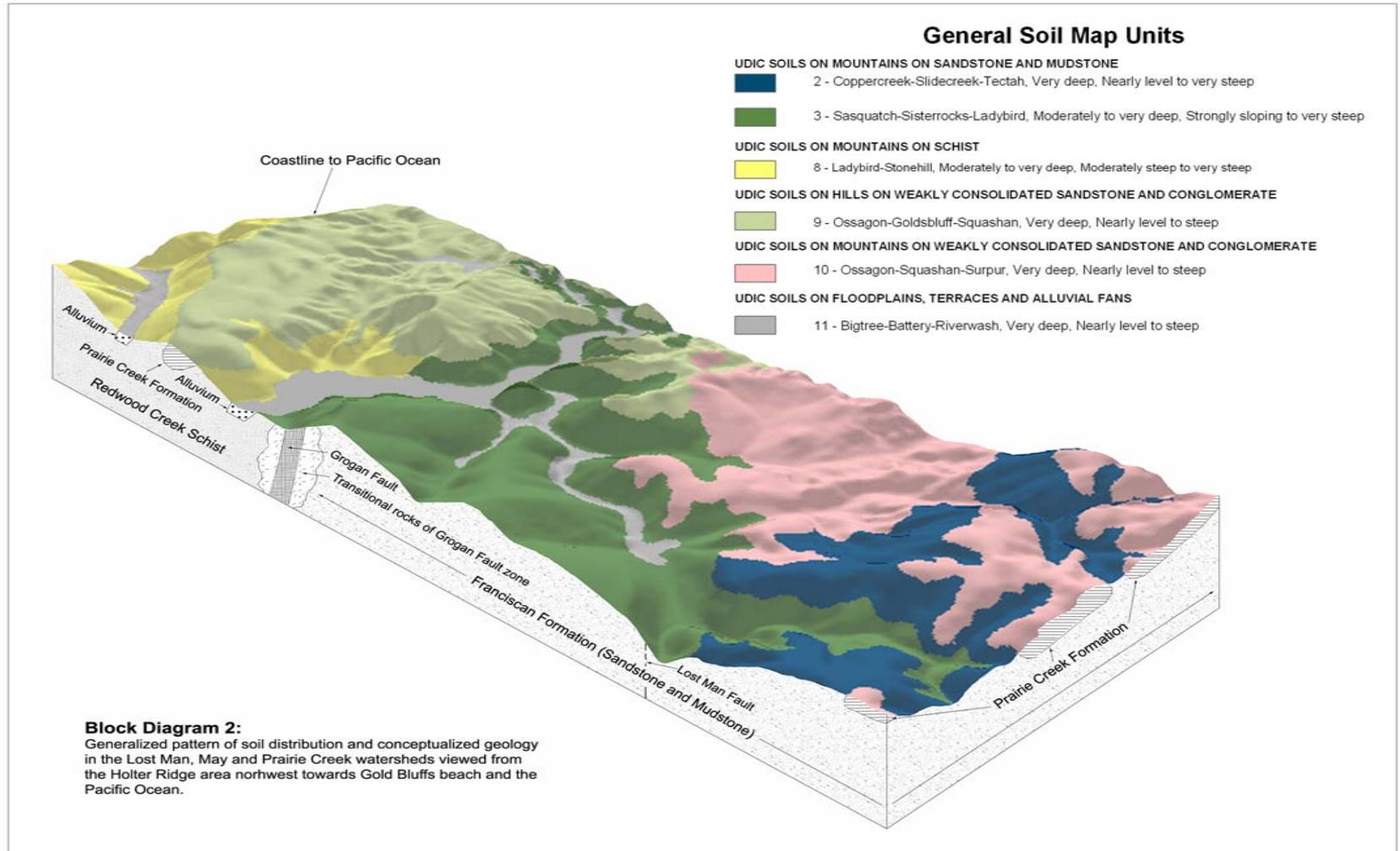
Map: Topographic map showing the site location (R015X1100CA) on hills with slopes ranging from 2 to 75% at elevations from 984 to 2998 feet. The map includes a legend for PNNI Pedons, PNNI Boundary, PNNI Soil, and pinn_hs. The site is highlighted in green on the map.

Example block diagrams using SSURGO

Stylized geologic formations added in

Map units aggregated together

Redwoods NP (REDW)



Redwoods NP (REDW)

General Soil Map Units

UDIC SOILS ON MOUNTAINS ON SANDSTONE AND MUDSTONE

- 2 - Coppercreek-Slideo creek-Tectah, Very deep, Nearly level to very steep
- 4 - Atwell-Coppercreek, Very deep, Moderately steep to steep

UDIC SOILS ON MOUNTAINS ON SCHIST

- 5 - Coppercreek-Ahpah-Lacks creek, Moderately to very deep, Nearly level to very steep
- 6 - Trailhead, Very deep, Nearly level to steep
- 7 - Devils creek-Panther creek-Coppercreek, Very deep, Steep to very steep

UDIC SOILS ON FLOODPLAINS, TERRACES AND ALLUVIAL FANS

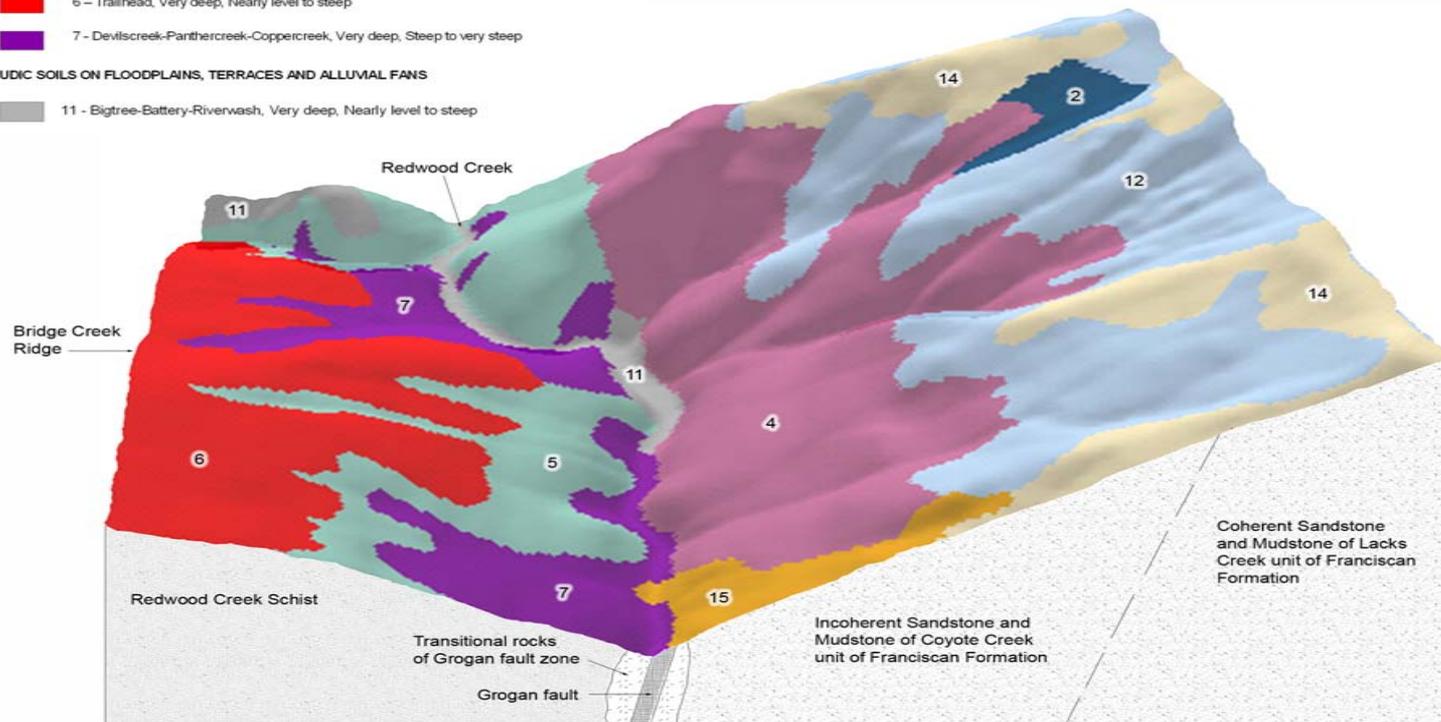
- 11 - Bigtree-Battery-Rivervash, Very deep, Nearly level to steep

USTIC SOILS ON MOUNTAINS ON SANDSTONE AND MUDSTONE

- 12 - Wiregrass-Rocksaddle-Scaath, Moderately to very deep, Strongly sloping to very steep

XERIC SOILS ON MOUNTAINS ON SANDSTONE AND MUDSTONE

- 14 - Dolason-Elkcamp-Airstrip, Moderately to very deep, Nearly level to steep
- 15 - Pasturerock-Coyoterock-Doolyville, Very deep, Moderately steep to steep



Block Diagram 3. Generalized pattern of soil distribution and conceptualized geology in the Redwood Creek watershed viewed from the Hog Prairie area north towards Harry Weir Creek.

Channel Islands NP (CHIS)

Soil Survey of Channel Islands National Park, California

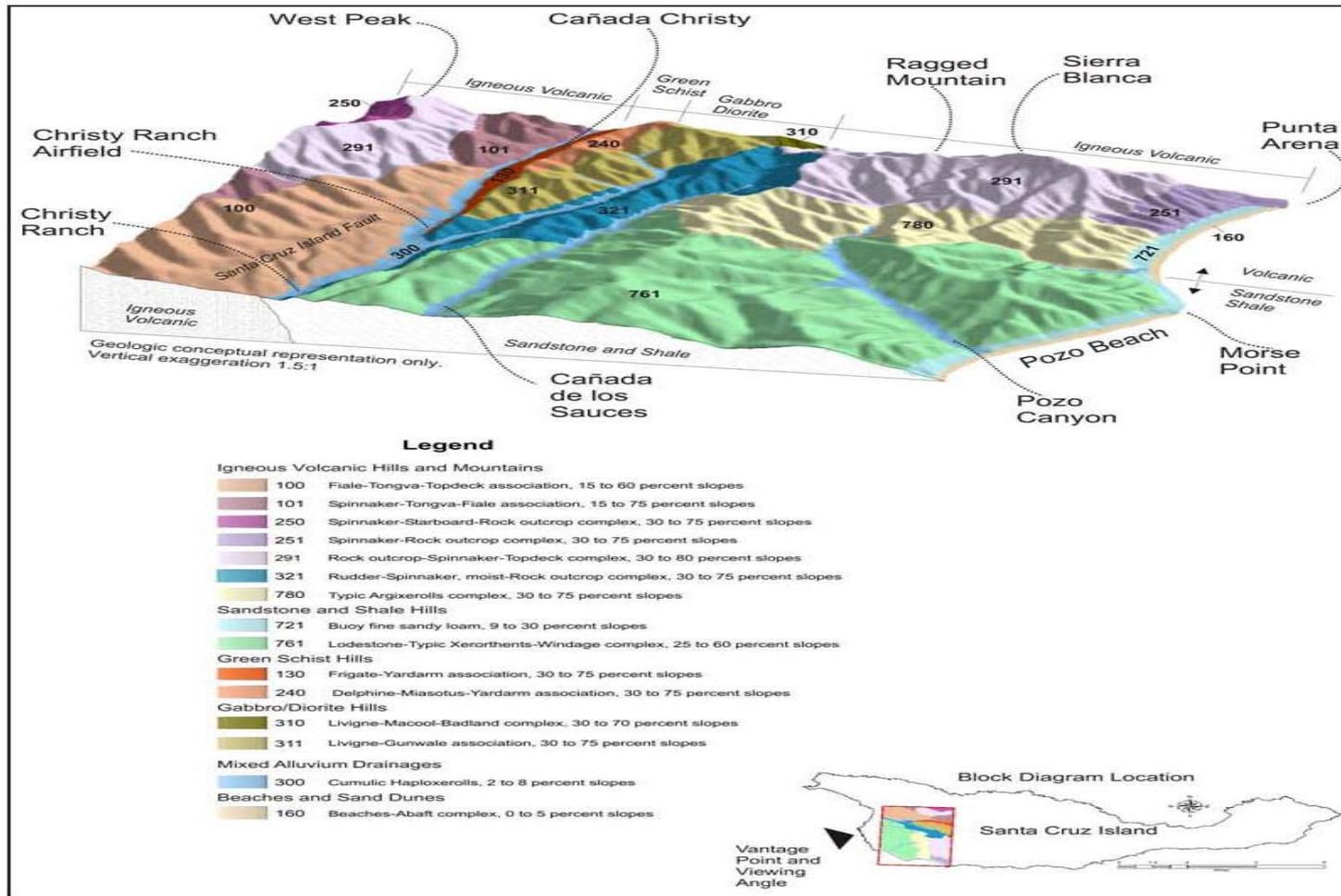
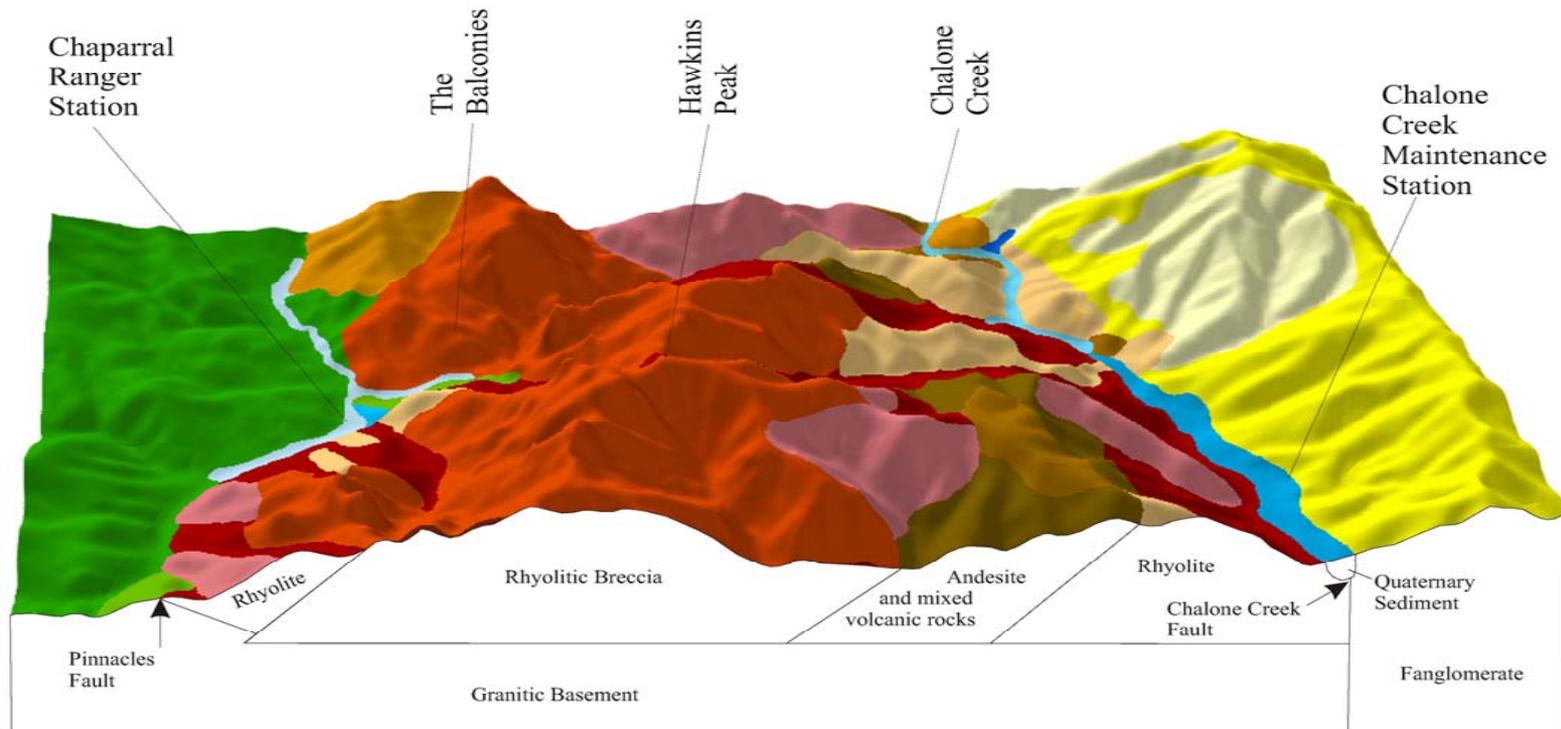


Figure 29.—Looking northeast on Santa Cruz Island. The Santa Cruz Island fault runs east along Canada Christy. The various kinds of parent material are depicted.

Pinnacles Nat'l Monument (PINN)

Block Diagram Relating Soils, Landforms, and Geology



Conceptual representation of geology. Vertical exaggeration 1.5:1.

4. What so cool about my park's soil?

Integrating soil science into park educational material

Emphasis on soils as the dynamic interface between rock and plant



4. What's so cool ...continued

Series Type Locations – accurately populated in NASIS pedon

Special properties – tephra layers, horizons from historic floods, rare plants

Unique to park – mapped nowhere else ...a park story to tell

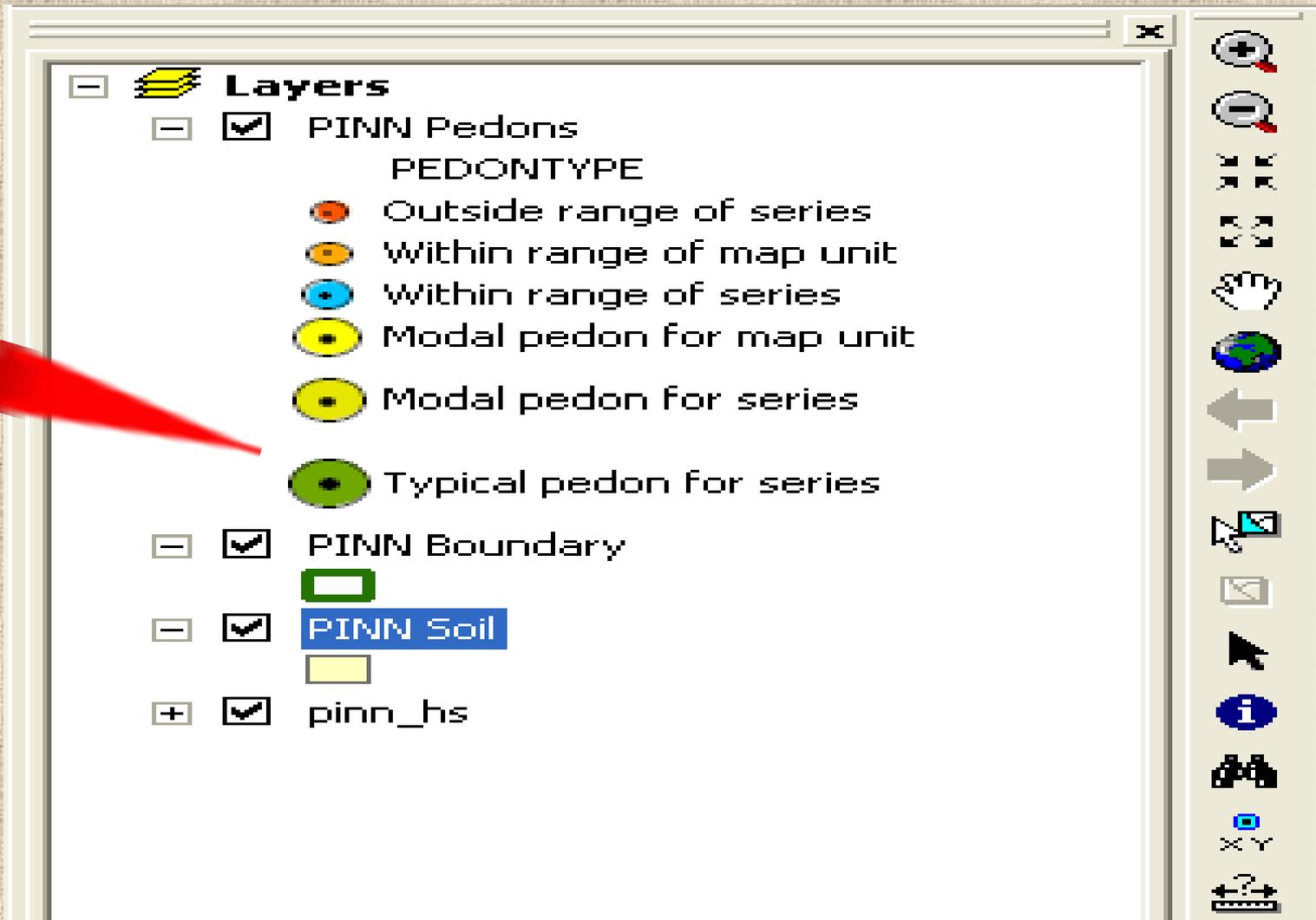
Benchmarks – what an opportunity to preserve a site!

Monoliths – for visitor center display



Series Type Locations

identified in NASIS pedon and in export to park



4. What so cool....continued



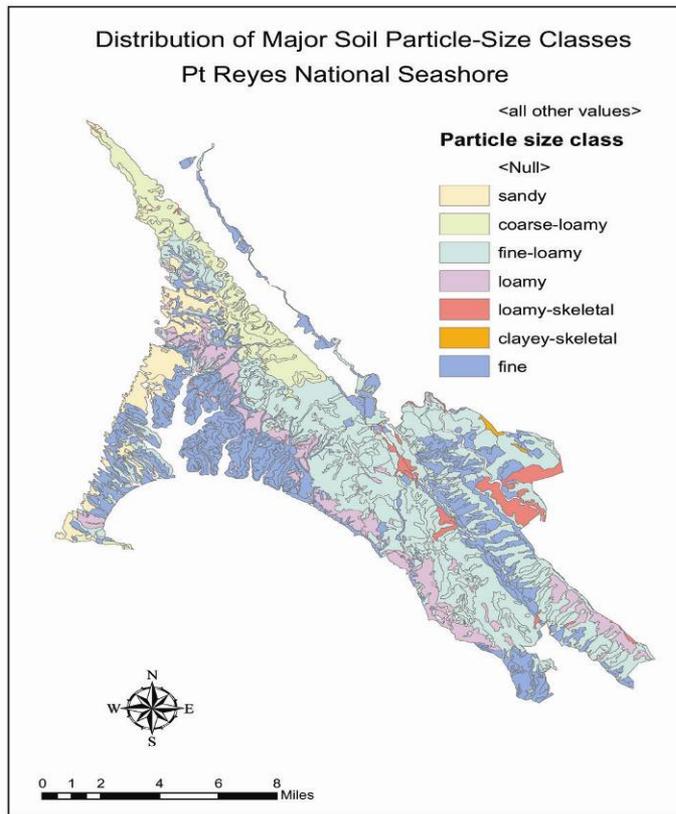
Soil fact sheets –
provide me a sketch
of ideas or write your
own fact sheet that
could be used locally



Monoliths



5. Consistent SSURGO exports including local and standard interpretations



Include all interpretations in the agreement

Check with me before doing a park SSURGO export incase anything new we want to include

NPS template in the works



6. Population of the National Park System Lands Legend Area Overlaps in NASIS

WHY?

- Overlap table is included in SDM export as an overlap table. This allows automatic update of symbols and data
- Many parks lands are multi-county within a state. Overlaps allow selection of park map units by standard four letter park code
- SDM report manager allows selection by overlaps – can run special park reports uniformly across many SSAs

NASIS (20257) - MLRA02_Office

File Edit View Options Help

SAVE CUT COPY PASTE TABLE TABLE SORT Object Status Edit Setup Default Group Unchanged Default NPS HELP

CLEAR CANCEL CA069 Cell Status CHOICE ZOOM

Legend

Area Type Name	Area Symbol	Area Name	Area Acres	MLRA
- Non-MLRA Soil Survey Area	CA069	San Benito County, California	889139	davis, ca

Legend Area Overlap

Area Type Name	Area Symbol	Area Name	Overlap Acres	Rec ID
- County or Parish	CA069	San Benito	889139	21
- MLRA	14	Central California Coastal Val	120765	21
- MLRA	15	Central California Coast Range	742905	21
- MLRA	17	Sacramento and San Joaquin Val	29770	21
- National Park System Land	PINN	Pinnacles National Monument	24501	43
- State or Territory	CA	California	889139	36

Update Report

My Computer

My Network Places

NetManage ViewNow

Recycle Bin

Internet Explorer

Microsoft Office ...

DVD Player

Sue_pres...

DNR Garmin

Sue's draft schedule f...

SSURGO 2 editguide....

For “harvested” data of parks already mapped

I have prepared overlap legends for 154
non-mlra soil survey areas from the
following states:

AL AR AZ DC FL GA IA IN KY LA MD
ME MI MO MS MT NC ND NE NJ NM
NV NY OH OR PA SC SD TN TX VA
WA and WV

The 154 legends represent 43 parks

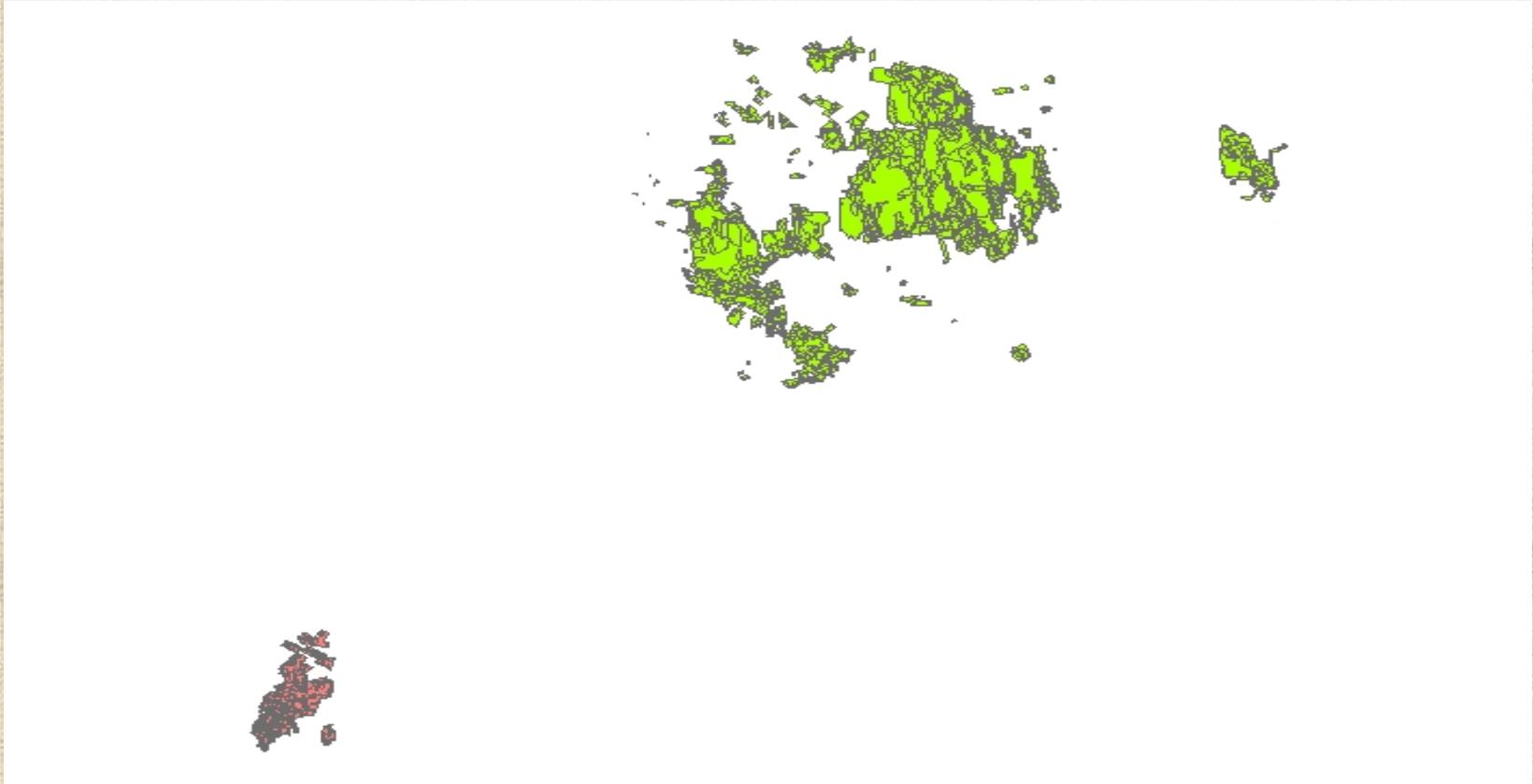
For “harvested” data of parks already mapped

I can either:

1. Provide the NPS overlap list to each states database manager for them to enter in NASIS
or
2. The state NASIS database manger can give me permissions to the legend object and I will enter NPS overlaps

See handout

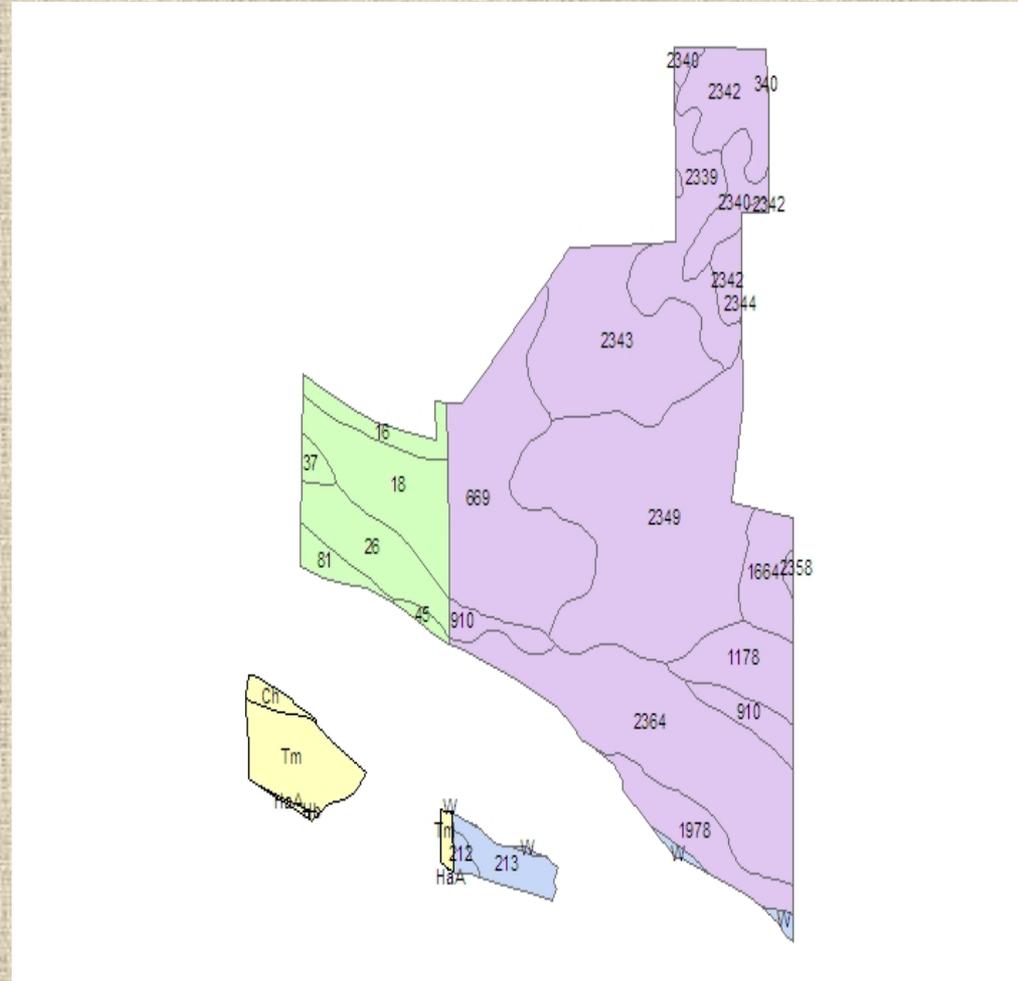
ACADIA NP, Maine



This park is a good example for use of overlaps....many islands of ownership, and the multi-county park has only one shared symbol – Water which we resolved in the attribute table in ARCMAP

Two states and 4 Soil survey areas

Many parks lands are multi-state, multi-county so creating a understandable NPS legend requires quite a bit of post-processing after SDM harvesting





Disadvantages of Overlaps

- 1. Does not create one park legend**

- 2. Multi-county parks still have issues with**
 - a) Numerous symbols with different data**
 - b) Same symbols with different data**
 - c) Same symbols with different mu names**
 - d) Different symbols with same map unit name**

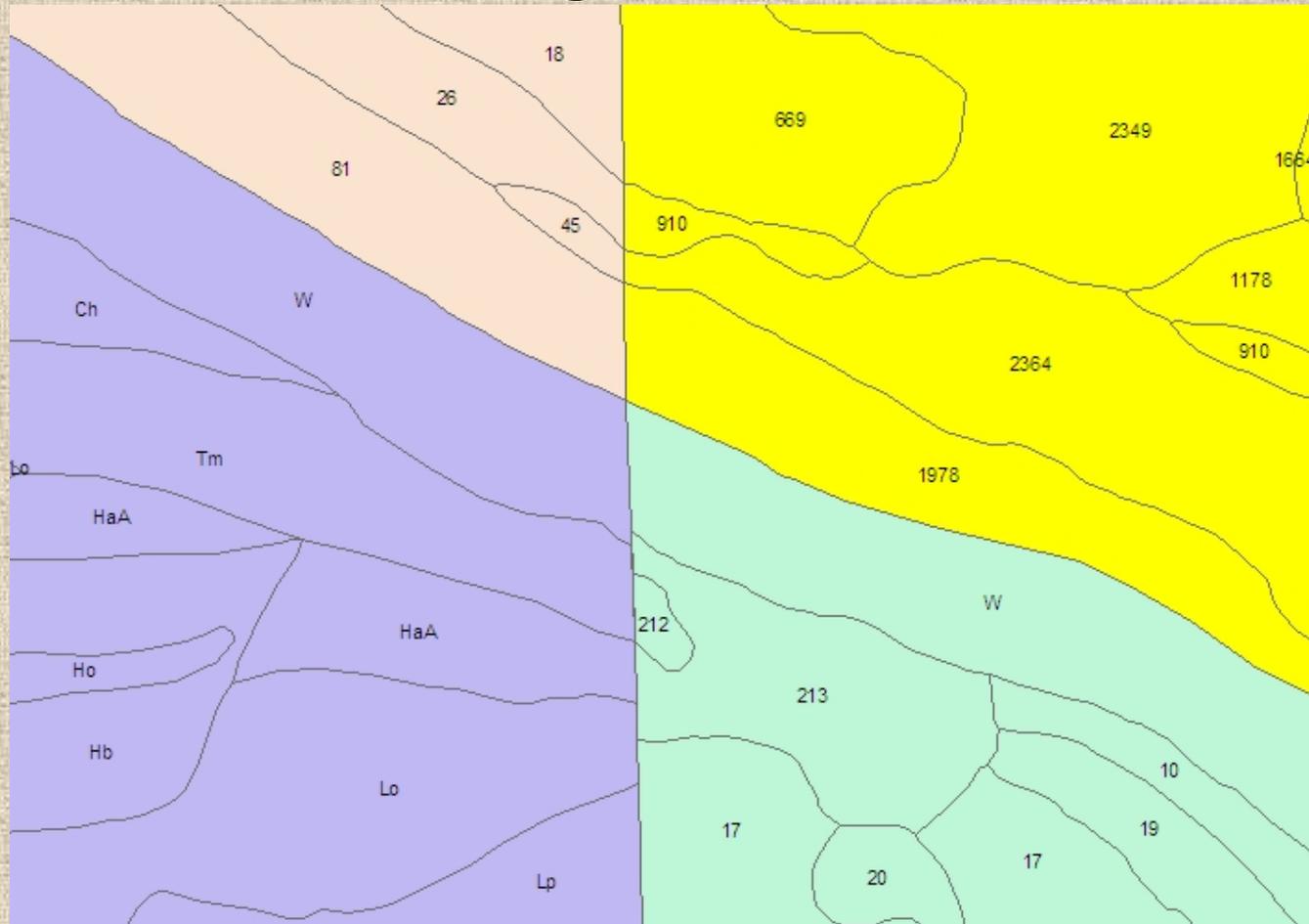
Disadvantages of Overlaps

- 3. Maintenance required by MO/States as soil mapping updates occur (i.e. adding new map units, etc)**
- 4. Overlaps legends not available on WSS, SDV**
- 5. Future boundary changes**

Simply....

Not always best answer for parks that can be set up as non-mlra soil survey areas

We know this is what update mapping is all about



My analysis will help target parks with specific needs that may be funded as part of Natural Resource challenge

Trying to use overlaps to create a park legend

MU Symbol	MU name	DMU ID
53B	Savage-Daglum silt loams, 0 to 6 percent slopes	208966
53B	Chama-Sen-Cabba silt loams, 3 to 6 percent slopes	208941

Same sym, different mu name, different data

19C	Chama-Cabba-Sen silt loams, 6 to 9 percent slopes	208942
53C	Chama-Cabba-Sen silt loams, 6 to 9 percent slopes	208942

Different sym, same mu name, same data

102B	Boxwell-Kremlin loams, 0 to 6 percent slopes	209008
102B	Kremlin-Ethridge-Gerda complex, 0 to 6 percent slopes	210020
92B	Kremlin-Ethridge-Gerda complex, 0 to 6 percent slopes	210020

Third scenario - both conditions above

Any questions?

Now some fun stuff.....



File Edit View Favorites Tools Help



Address http://casoilresource.lawr.ucdavis.edu/soil_web/ssurgo.php?action=explain_mapunit&query_scale=23000&qu Go Links >>

California Soil Resource Lab

Map Unit Composition

Map units consist of 1 or more soil types, commonly referred to as "components".

Component Name	% of Map Unit	Component Type	Horizon Data
<i>Soil Type 1 Corning</i>	45	<i>Major Soil Type</i>	YES
<i>Soil Type 2 Corning</i>	40	<i>Major Soil Type</i>	YES
<i>Soil Type 3 Creviscreek</i>	4	<i>Inclusion</i>	<i>Similar Data [1] *</i>
<i>Soil Type 4 Hicksville</i>	4	<i>Inclusion</i>	<i>Similar Data [3] *</i>
<i>Soil Type 5 Redding</i>	4	<i>Inclusion</i>	<i>Similar Data [2] *</i>
<i>Soil Type 6 Steeper slopes, unnamed</i>	3	<i>Inclusion</i>	None

Note: links to horizon data marked with an * are approximate.

Map Unit Data What is a Map Unit?

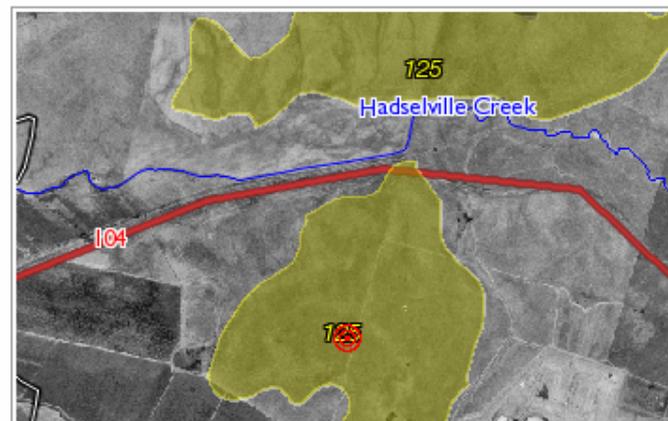
Cartographic information about this map unit.

Map Unit Name:	<i>Corning complex, 0 to 8 percent slopes</i>
Map Unit Type:	<i>Complex</i>
Map Unit Symbol:	125
Map Unit Acres:	<i>174 acres (14990ac. total in survey area)</i>

Map Unit Aggregated Data

Generalized soils information within this map unit.

Farmland Class:	<i>Not prime farmland</i>
Available Water Storage (0-100cm):	<i>8.95 cm</i>
Max Flood Freq:	<i>None</i>
Drainage Class:	<i>Well drained</i>
Hydric Conditions:	<i>Partially hydric</i>
Min Water Table Depth:	<i>n/a</i>



Done

Internet

http://casoilresource.lawr.ucdavis.edu/soil_web/ssurgo.php?action=explain_mapunit&query_scale=23000&query_xy=-20

Internet

CA Soil Resource Lab (UC Davis)

Zoom to Street Address:

Address:

City:

State:

GO

Zoom to CA PLSS Grid:

Section Information

1/4

1/4

Section

Township / Range Information

T

N

R

E

Mt. Diablo, CA

GO

Zoom to Geographic Coordinates:

Decimal Degrees

Degrees Minutes Seconds

Latitude: ° North

°

′

″

North

Longitude: ° West

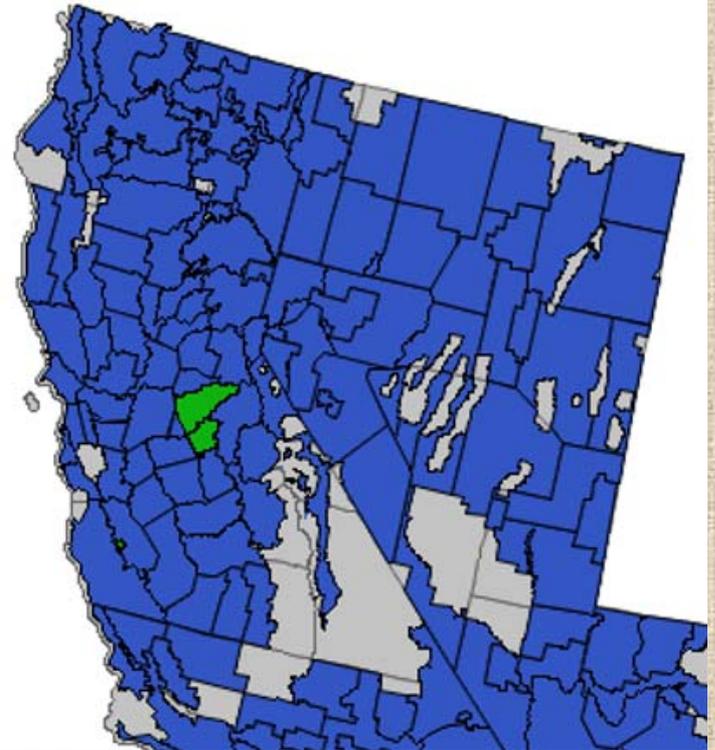
°

′

″

West

GO



Soil Taxonomy

Order:	<i>Alfisols</i>
Suborder:	<i>Xeralfs</i> [Map of Suborders]
Greatgroup:	<i>Palixeralfs</i>
Subgroup:	<i>Typic Palixeralfs</i>
Family:	<i>Fine, mixed, thermic Typic Palixeralfs</i>
Phase:	<i>Corning complex, 0 to 8 percent slopes</i>
Soil Series:	<i>Corning</i> (Link to OSD) (Link to SM Tool)
Data:	[Lab Data] [Nitrate Groundwater Pollution Hazard Index]
Raw Data	Component All Horizons

Land Classification

Storie Index	36
Land Capability Class [non-irrigated]	3-e
Land Capability Class [irrigated]	2-e

Soil Suitability Ratings

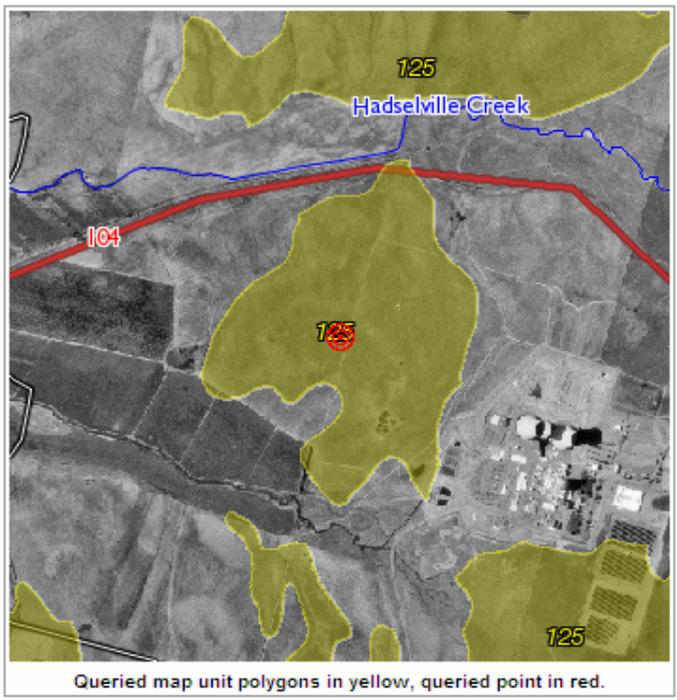
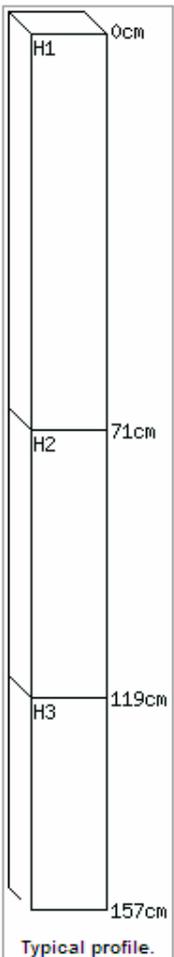
<i>Waste Related</i>	<i>Engineering</i>
<i>Urban/Recreational</i>	<i>Irrigation</i>
<i>Wildlife</i>	<i>Runoff</i>

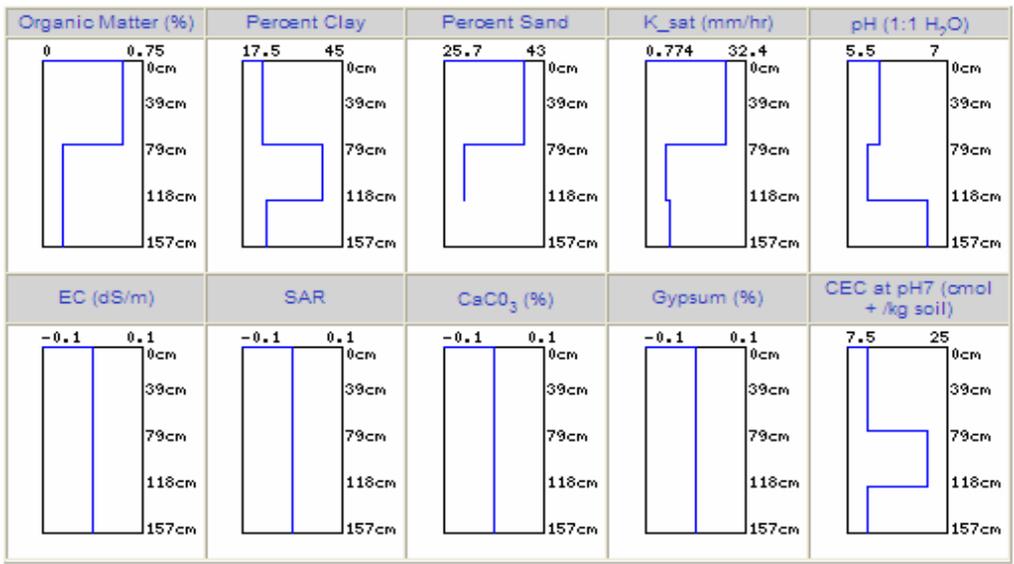
Erosion

Wind Erodibility Group	6
Wind Erodibility Index	48
T Erosion Factor	4
Runoff	High
Drainage	Well drained
Parent Material:	gravelly alluvium

Geomorphology

Landscape	valleys
Landform	terraces [Toeslope]





Waste Related

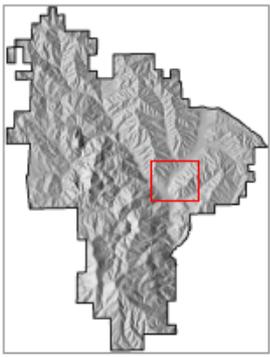
AWM - Manure and Food Processing Waste	Very limited 1. Slow water movement 2. Runoff 3. Too acid 4. Droughty	(Percolation < 2 um/sec to 60 inches) (Intake Rate) (Surface Reaction (pH 3.5 to 6.5)) (Droughty, AWC 0 to 150cm)
AWM - Land Application of Municipal Sewage Sludge	Very limited 1. Slow water movement 2. Too acid 3. Droughty	(Percolation (1 - 4 um/sec) 0 to 60 inches) (Surface Reaction (pH 5 to 6.5)) (Droughty, AWC 0 to 150cm)
AWM - Rapid Infiltration Disposal of Wastewater	Very limited 1. Slow water movement 2. Slope	(Percolation (10 - 40 um/sec) 0 to 60 inches) (Sloping 3.9 to > 8%)
AWM - Slow Rate Process Treatment of Wastewater	Very limited 1. Slow water movement 2. Too acid 3. Too steep for surface application	(Percolation (.4 - 4 um/sec) 0 to 60 inches) (Surface Reaction (pH 5 to 6.5)) (Slope 2.9 to > 8% surface)

ENG - Septic Tanks (CA)	Limitations 1. Permeability < .6/hr in 24-60 (slow perc) (Pem (slow perc) in 60-150cm, l, h, rv)
ENG - Sewage Lagoons (CA)	Limitations 1. Slopes 2 to 8% (Slopes, 2-8% - MO2) 2. Permeability .6-2/hr (some seepage) (Pem (seepage) .6 to >2/hr, 30-150cm (12-60) - MO2)
ENG - Sanitary Landfill (Trench) (CA)	Limitations 1. Clay loam, silty clay, silty clay loam (Clayey texture, 25 to 180cm w/min and climate condition - MO2)
ENG - Dwellings W/O Basements (CA)	No limitations
ENG - Dwellings With Basements (CA)	Limitations 1. Shrink-swell (LEP >6) (Shrink-Swell, (LEP thick. layer above R or 150cm) - MO2)
ENG - Small Commercial Buildings (CA)	Limitations 1. Slopes are from 4 to 8% (Slopes, rv < 4 to > 8% - MO2)
ENG - Shallow Excavations (CA)	Limitations 1. Caving potential (Caving, outbanks - MO2) 2. Clay from 40 to 60% (Clay %, >40, 50-150cm - MO2)
ENG - Sanitary Landfill (Area) (CA)	No limitations
ENG - Daily Cover for Landfill (CA)	Not suited 1. Depth to pan > 60 (Depth to cemented pan 100-150cm - MO2) 2. Depth to bedrock > 60 (Depth to bedrock (lithic/paralithic) 100-150cm - MO2) 3. Not ponded (Ponding, any (use to be copied 1027, >4hr) - MO2) 4. If saturated, wetness > 40 depth (Wetness - either, 45 to 105cm - MO2) 5. Texture is not sandy (USDA texture, sandy textures, thickest, 25-180cm - MO2)
ENG - Local Roads and Streets (CA)	No limitations
ENG - Construction Materials; Topsoil (CA)	Poor source 1. Rock fragment content (POT - Gravel and rocks in the thickest layer to 100cm - MO2) 3. Hard to reclaim (POT - Gravel and rocks in the thickest layer 100-180cm - MO2)
ENG - Construction Materials; Roadfill (CA)	Poor source 1. AASHTO GIN > 8 (low soil strength) (POT - Strength (AASHTO GIN) thickest in 25-500cm or restric) 2. LEP 3 to 9 (POT - LEP wt. av. (25-150cm or restrictive layer) - MO2)
ENG - Construction Materials; Reclamation (CA)	Fair source 1. OM is .5 to 1% (POT - OM % <.5 to 180cm - MO2) 2. pH is between 4 and 6.5 above 40 (POT - pH Minimum (acid) test) 3. AWC 3 - 6 to 60 depth (POT - AWC 3-6 in 0-150cm - MO2)
ENG - Construction Materials; Sand Source (CA)	Poor source 1. Bottom layer not a source (POT - Sand bottom layer - MO2) 4. Thickest layer not a source (POT - Sand thickest layer (based on sieves) - MO2)
ENG - Construction Materials; Gravel Source (CA)	Poor source

Legend

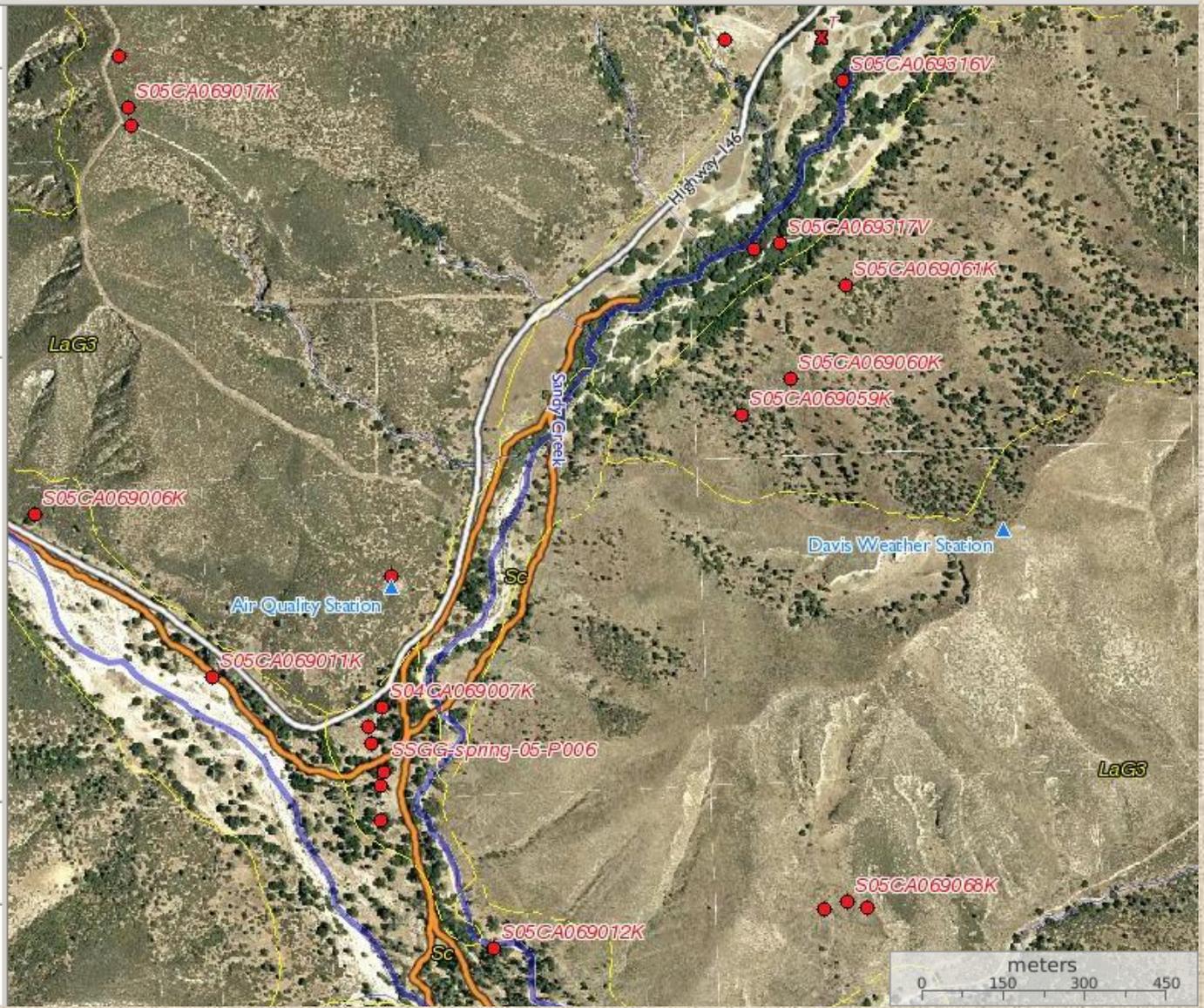
- ▲ WX Station
- ↖ Transect
- ✕ Auger Pit
- ▭ Paved Road
- ▭ Small Streams
- ▭ Large Streams
- ▭ trails
- ▭ Park Boundary

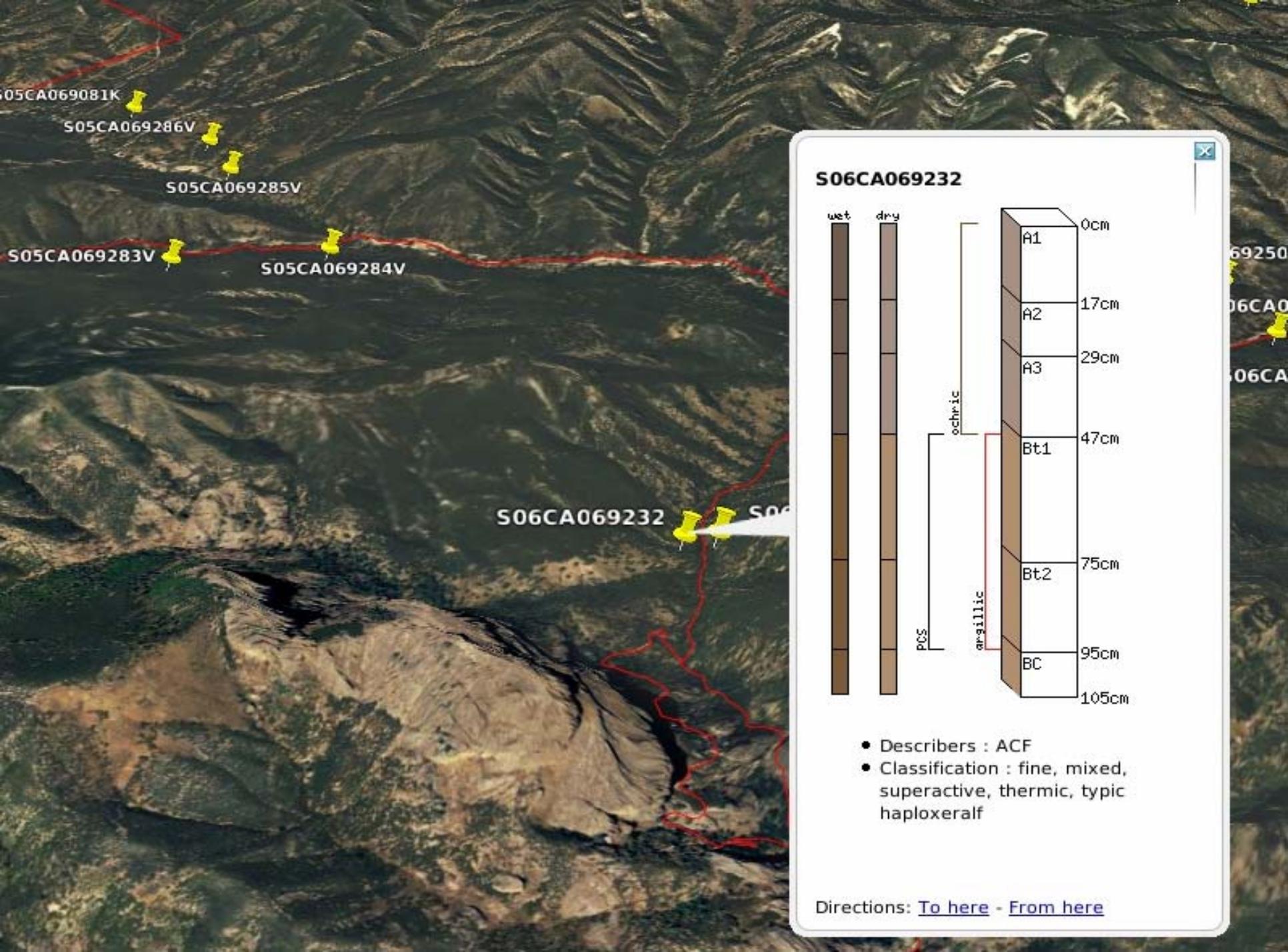
Keymap



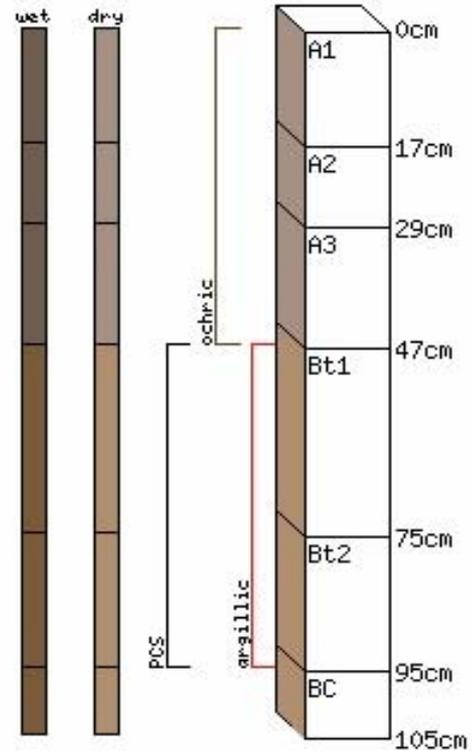
Coords

Longitude: 121.143176
Latitude: 36.480993



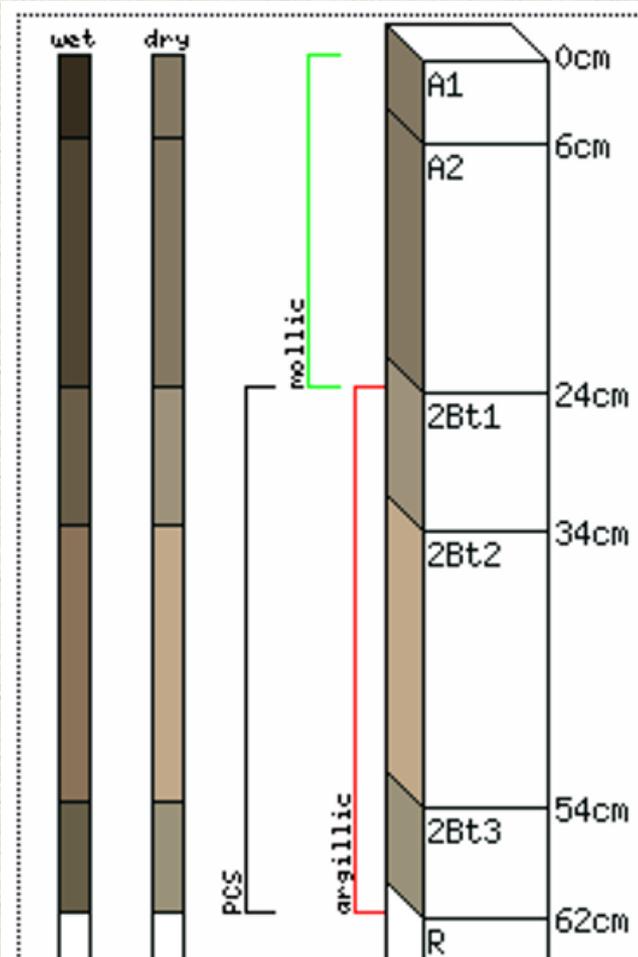


S06CA069232



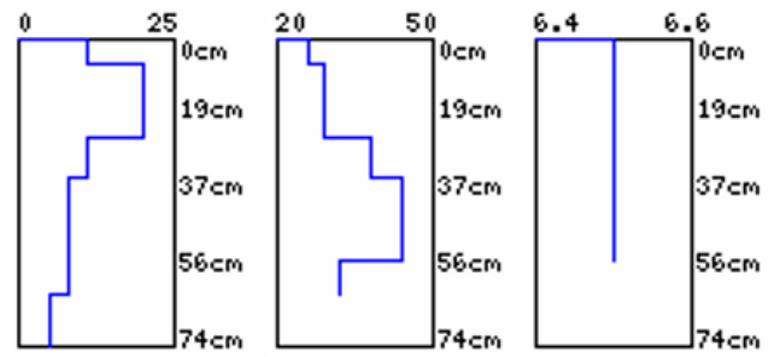
- Descriptors : ACF
- Classification : fine, mixed, superactive, thermic, typic haploxeralf

Directions: [To here](#) - [From here](#)

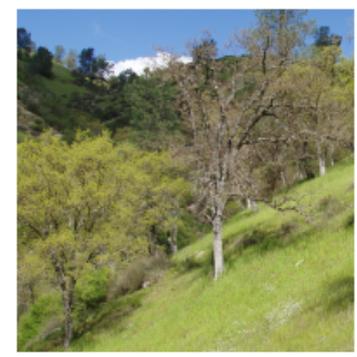


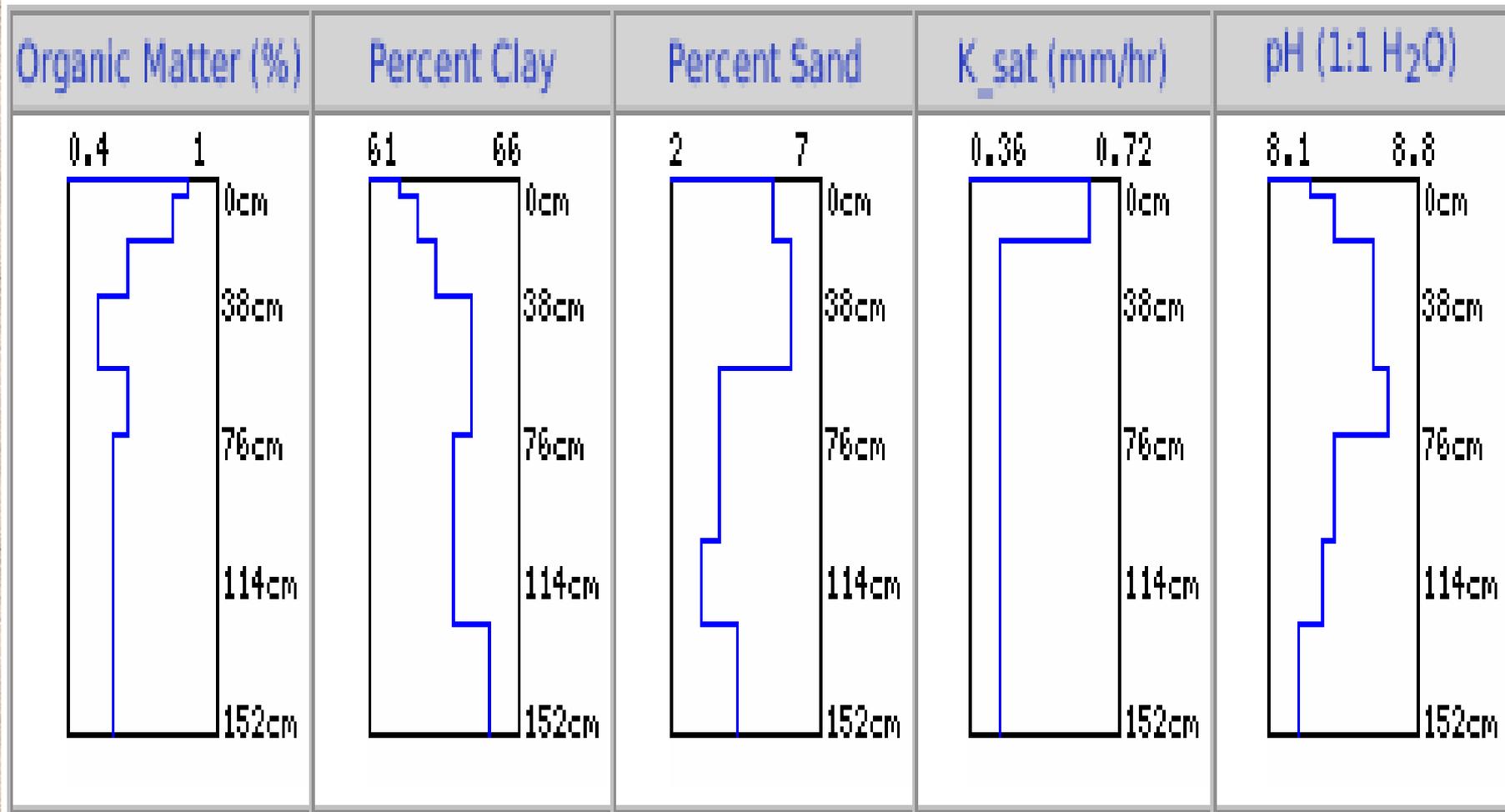
S04CA069002K Hzn Data [2004-10-20] [KO]
fine, smectitic, superactive, hyperthermic, typic argixeroll

RES from RHY



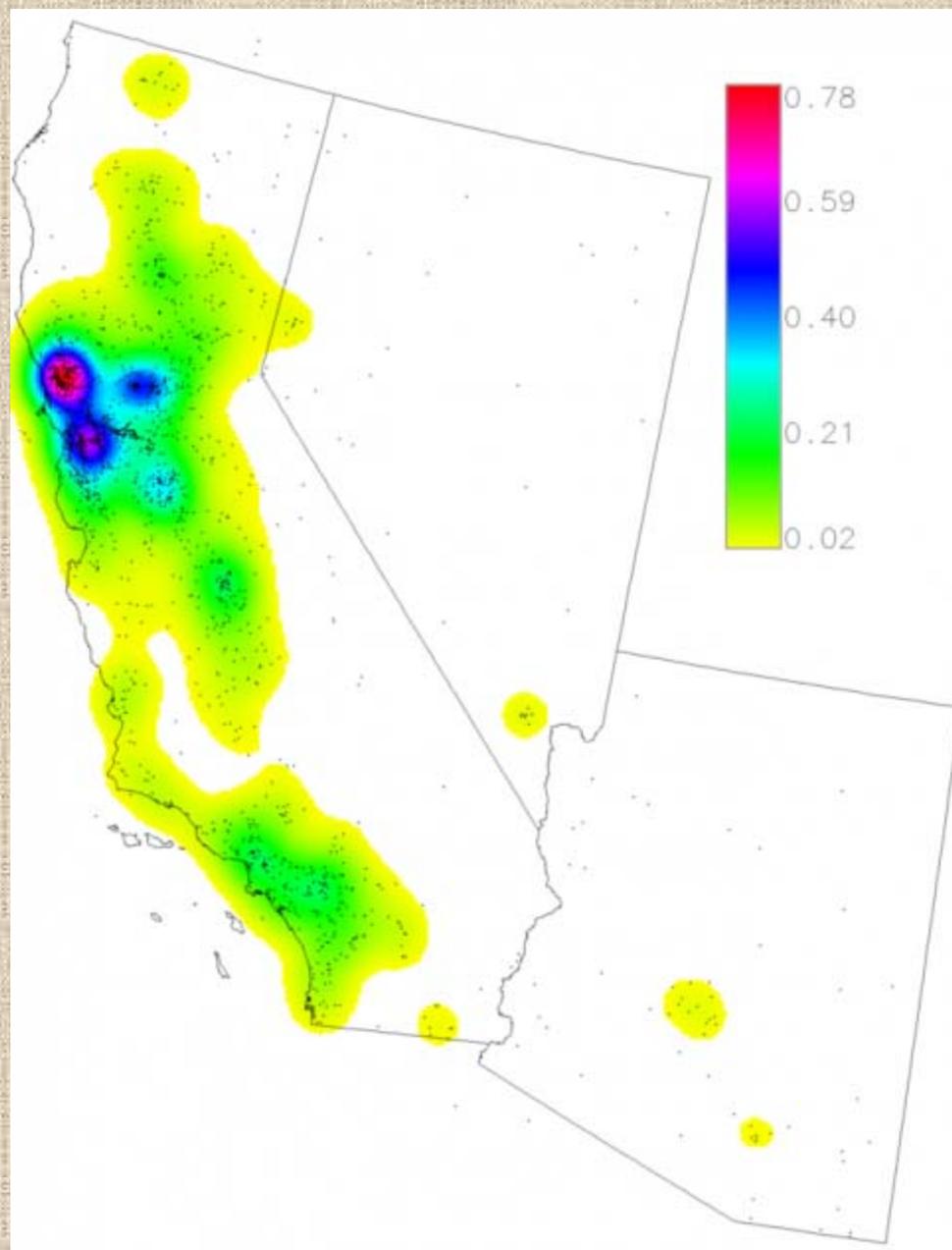
Frag Clay pH



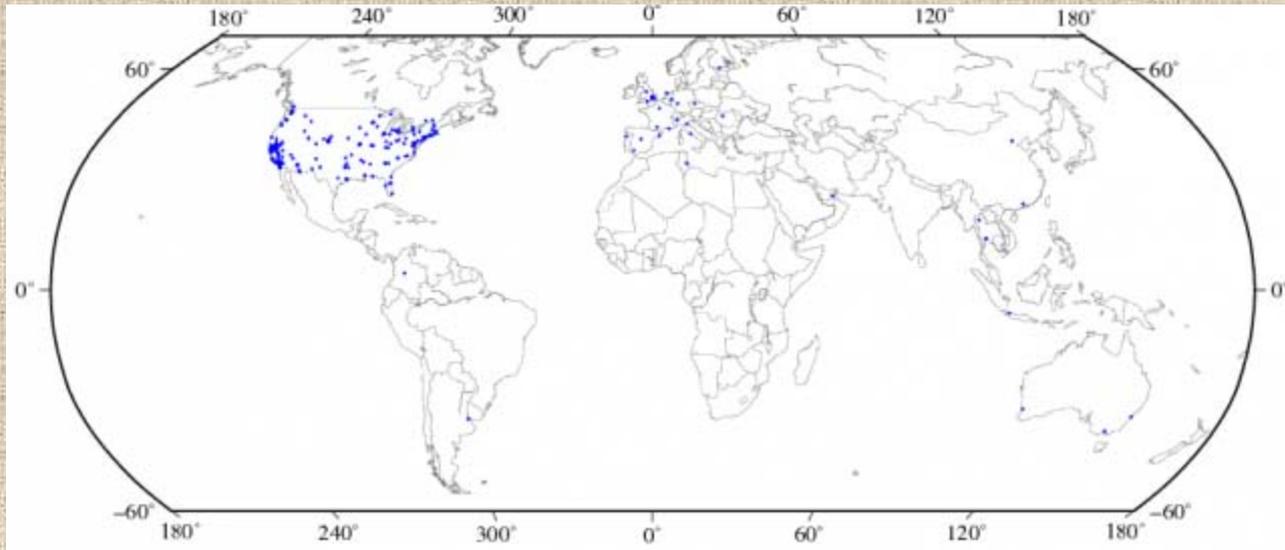




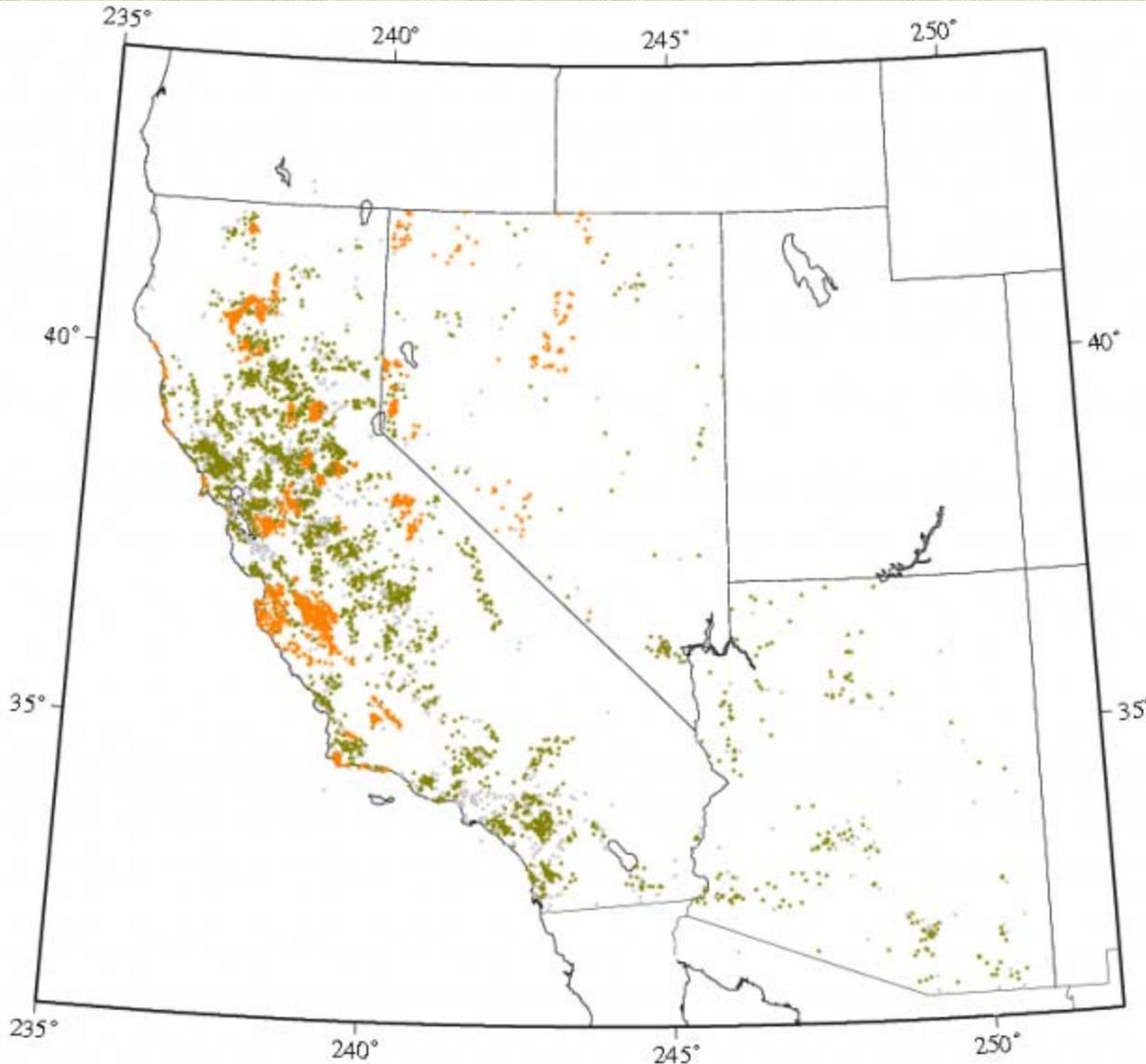
Heat map of users



World distribution of users



Where the polygons exist that are being queried



Tool to
assess
where to
start the
update

Last park and last slide



Park 6

Thank you!