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Update on The National Park Service Soil Survey Activities

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National Park Service



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National Level

Acres to be mapped	84.5 Million
Parks to be mapped	270
Acres mapped thru FY07	24.5 Million (29%)
Parks mapped thru FY07	140 (52%)
Alaska Acres	54 Million (64%)
Alaska Parks	16 (6%)



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NCSS West Region Status

Parks to be mapped	134 (50% of total)
Acres to be mapped	76.5 million (90% of total)
Alaska Acres to be mapped	48 Million (63%)
Alaska Parks to be mapped	15 (4%)
<hr/>	
Parks completed thru FY07	51 (38%)
Acres mapped thru FY07	13.7 million (18%)

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NPS Alaska Strategy



Plan for Soil-Ecological Surveys on Park Service Lands in Alaska



Alaskan Parks 16 (6%)

Alaskan Acres 54 Million (64%)

**Denali National Park Complete
(6 Million Acres)**

15 Parks and 48 Million acres remain

**Current Plan prioritizes Parks, will use
multiple mapping scales and multiple
levels of mapping orders to meet the
needs of the parks**

**Have initiated mapping at Yukon-
Charley Rivers National Preserve in
FY08 – 2.5 million acres**

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- **Current Interagency Agreements with NRCS in Western Region addresses;**
- **7 states**
- **36 parks**
- **15 million acres**
- **\$2.25 million annually**

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Alaska

Yukon – Charley Rivers National Preserve
2.5 Million Acres

Estimated Completion FY12

Dedicated Soil Survey Crew in Fairbanks

- **Soil Survey Project Leader**
- **Soil Scientist**
- **2 Plant Ecologists**



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Arizona

Glen Canyon National Recreation Area (UT689)

1.25 Million Acres

Estimated Completion FY 11

Dedicated Soil Survey Crew in Page, AZ

Soil Survey Project Leader

- **Soil Scientist**
- **Range Ecologist**

Will also map Petrified Forest NP, and other NPS units in Northern Arizona



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Arizona

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United States
Department of
Agriculture



Natural
Resources
Conservation
Service



In cooperation
with
United States
Department of
the Interior,
National Park
Service

Soil Survey of Canyon de Chelly National Monument, Arizona



Completed Canyon de Chelly National Monument in FY07

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California

Lassen Volcanic National Park (CA789)

108,000 Acres

Estimated Completion FY 09



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California

Joshua Tree National Park (CA794)

1.05 Million Acres

Estimated Completion FY 10



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California

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the Interior
National Park
Service

In cooperation with
Regents of the University
of California (Agricultural
Experiment Station)

Soil Survey of Channel Islands National Park, California



United States
Department of
Agriculture



NRCS

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United States
Department of
the Interior
National
Park Service

In cooperation with
Yosemite National Park
and the Regents of the
University of California
(Agricultural Experiment
Station)

Soil Survey of Yosemite National Park, California



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Department of
Agriculture



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United States
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National Park
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In cooperation with

Soil Survey of Santa Monica Mountains National Recreation Area, California



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California

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 United States Department of Agriculture

 NRCS
Natural Resources Conservation Service

In cooperation with  United States Department of the Interior, National Park Service and University of California, Davis.

Soil Survey of Pinnacles National Monument, California



 United States Department of Agriculture

 NRCS
Natural Resources Conservation Service

In cooperation with California Department of Parks and Recreation; California Department of Forestry; Humboldt State University; and United States Department of the Interior, Bureau of Land Management.

 United States Department of the Interior
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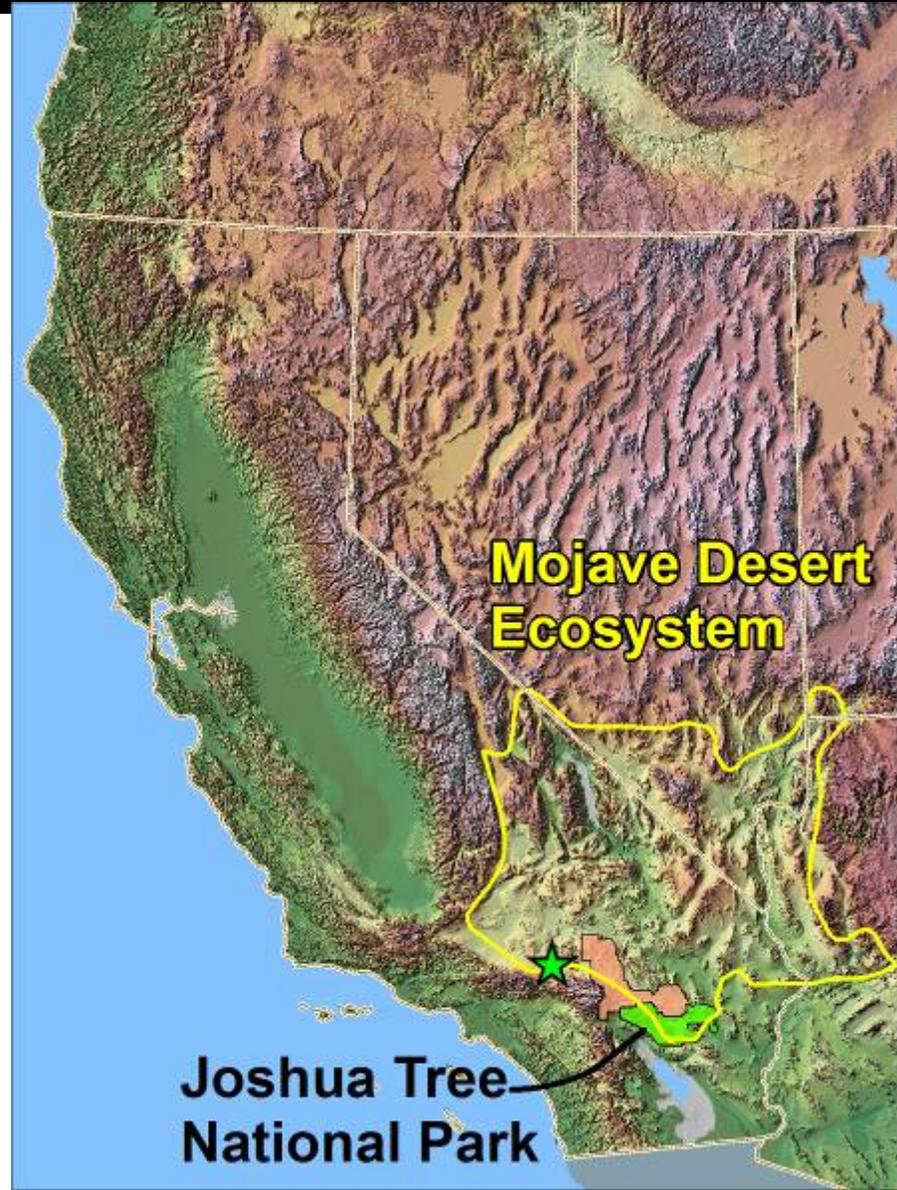
Soil Survey of Redwood National and State Parks, California



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Mojave Desert Digital Soils Mapping Project Area



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Idaho

City of Rocks National Reserve



- 15,000 acres
- Mapping and digitizing completed
- Manuscript needs to be developed
- Looking at setting it up as a new non-MLRA soil survey area

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Nevada

Great Basin National Park (NV708)



- 78,000 acres
- Mapping and digitizing 90% completed
- Estimated to be completed in FY09
- Will be set up as a new non-MLRA soil survey area by NRCS

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Proposed Soil Survey Areas



1:1,325,022

Great Basin National Park (NV708)



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Utah

Arches National Park (UT687)

77,000 Acres

Estimated Completion FY 08

Canyonlands National Park (UT688)

340,000 Acres

Estimated Completion FY 09

Dedicated Soil Survey Crew in Richfield, UT

- Soil Survey Project Leader
- Soil Scientist
- Range Ecologist
- Cultural Resource Specialist

**Will also work on Zion NP, Cedar Breaks NM,
and Bryce Canyon NP**



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Washington

North Cascades National Park Complex (WA774)

684,314 Acres

Estimated Completion FY 09

Utilizing Remote Area Soil Proxy (RASP) Model to facilitate mapping in wilderness and other remote areas

Continued Research from Washington State University on RASP Model
NPS Landform Mapping Project also underway to support RASP Model

Dedicated Soil Survey Crew in Mount Vernon, WA

- Soil Survey Project Leader
- Soil Scientist
- Forest Ecologist
- NPS Physical Scientist

Will also work on Mount Rainier NP, and Olympic NP



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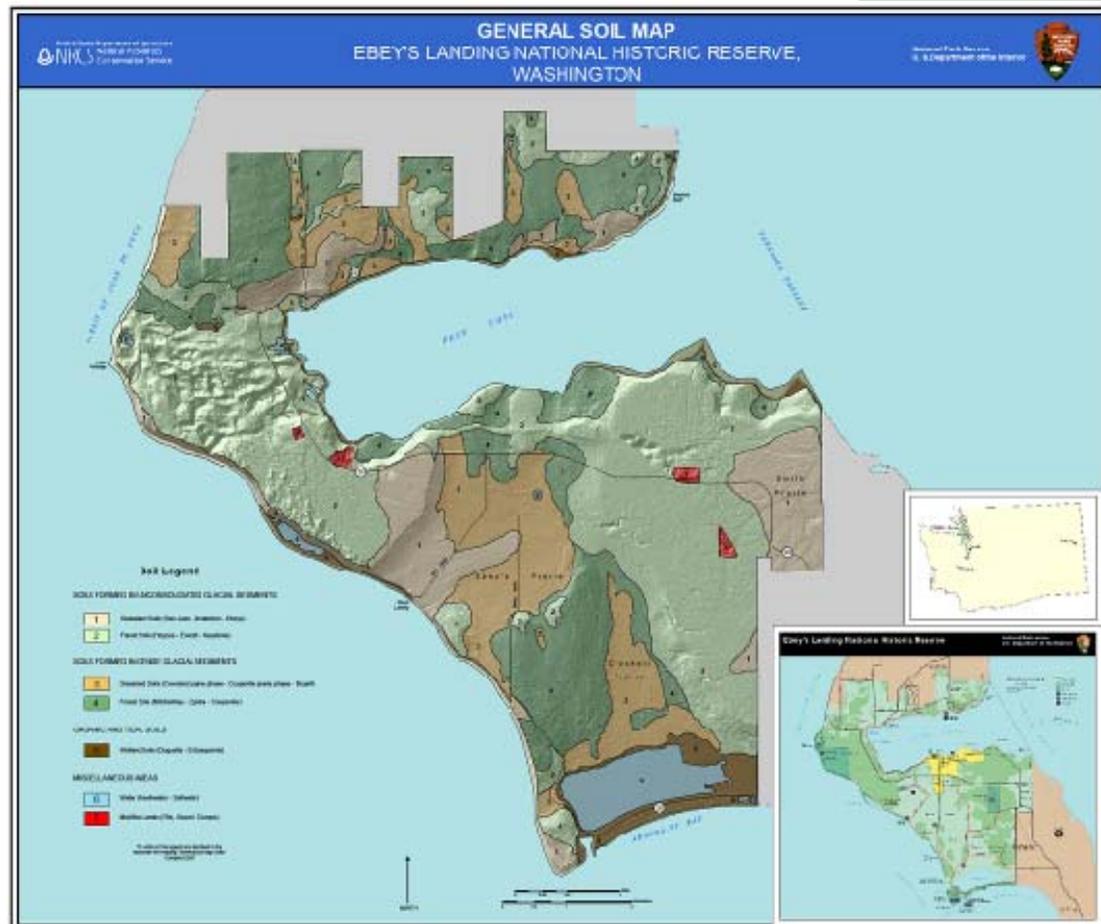


Washington

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Soil Survey of San Juan Island National Historical Park, Washington





Research Needs

NPS would like to see new focus on integrated research of soil properties and ecological sites to improve the use and management and interpretation of soils which might otherwise be broadly mapped

- Soils with chemical crusts (Death Valley, Yellowstone)**
- Various soils developing with desert pavement**
- Soils with upper horizons dominated by vesicular pores**

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Ecological Site Descriptions

Essential and Required for all funded NPS projects in Western Region

Suggest more relevant information in the Soils section of the ESD to showcase relationships of soil properties and plant composition and plant physiology.

Depict “soil states” in State and Transition models

Need to continue to review different levels of ESD’s to meet new concepts of resource inventories currently underway

Consider an ecological site for miscellaneous units named the same (riverwash, badlands, etc.)

NPS Soil Resource Inventory Staff



Pete Biggam - Soils Program Manager

Judy Daniels - Data Manager

Branon Barrett – GIS Specialist

Troy Kashon – GIS Specialist

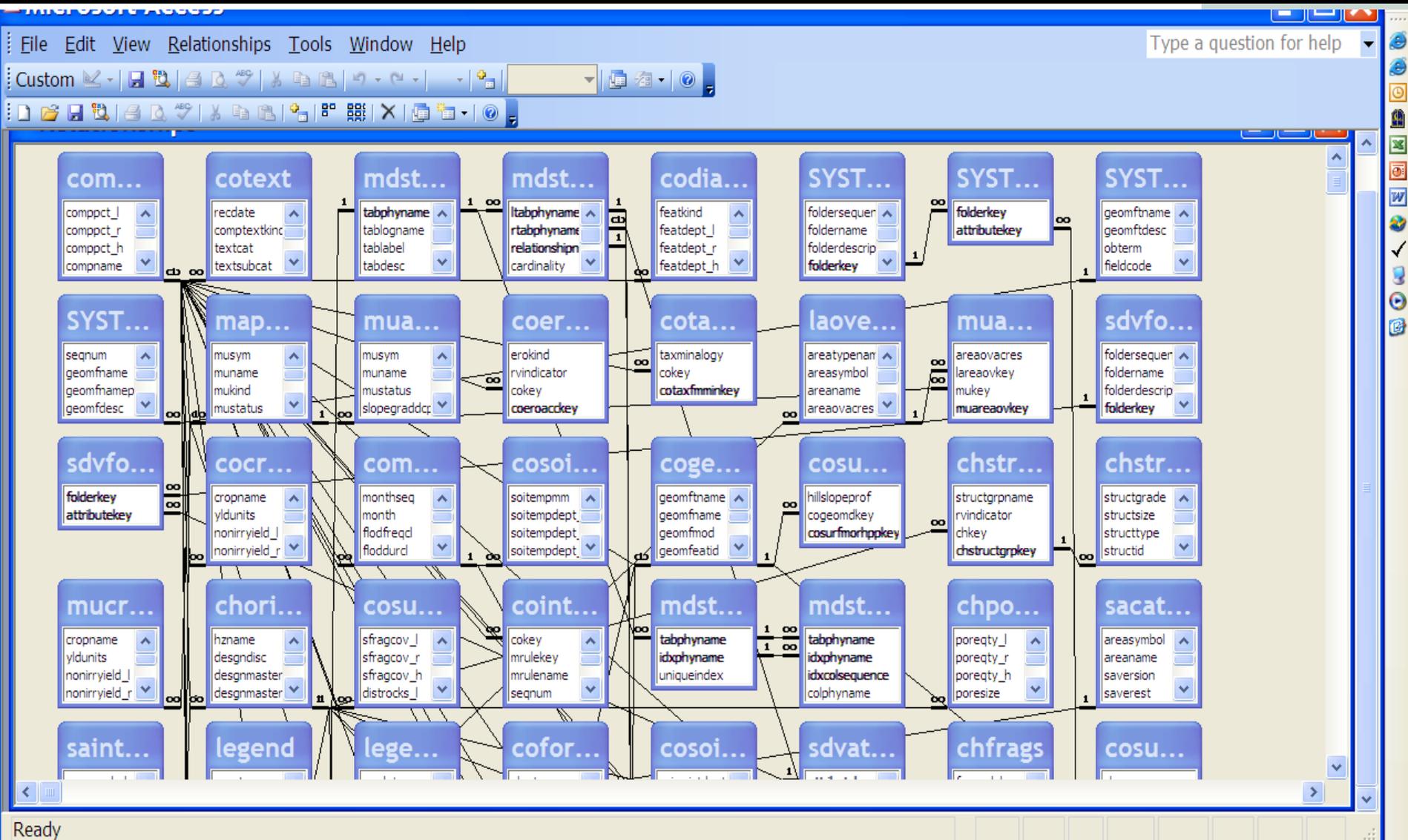
Sue Southard – NRCS/NPS Liaison



Our Goal.....

Promoting the use of soils information in NPS decision making and making it accessible in a user friendly way to staff and partners.

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What does the NPS want for soil survey deliverables?

- Set up of the NPS lands as a non-MLRA soil survey area where applicable and reasonable (parks > 10,000 acres not available on Web Soil Survey)
- SSURGO map unit/data map unit (dmu) data unique or edited to meet what is present *within the park* (dmu's not always linked to those external to the park)
- All pedon and other site data georeferenced and entered into NASIS
- Emphasis on how soils relate within the park ecosystems and the processes that form them

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What does the NPS want for soil survey deliverables?

- What's so cool about this park's soil?
- Consistent SSURGO exports including local and standard interpretations to meet NPS needs
- For all parks, even if previously mapped, completion of NPS System Lands map unit overlaps in NASIS

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What's the Point with Point Data?

Type locations, lab data, transect data, and road cut observations all may all be used by NPS staff and researchers

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

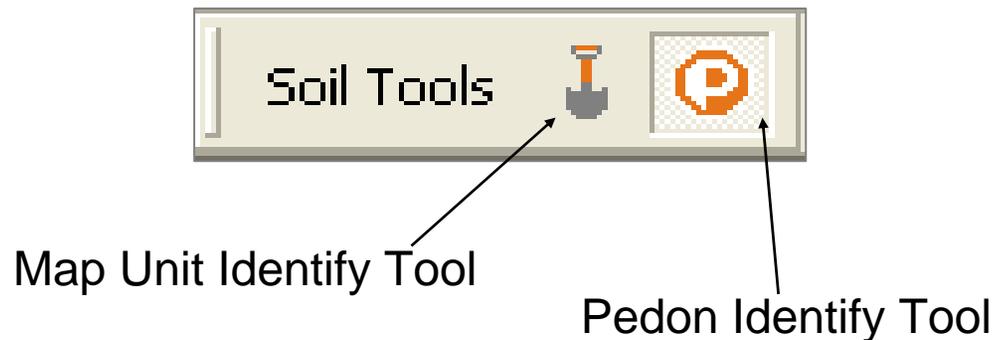


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The SRI is currently developing an ArcGIS Desktop toolset that will geospatially link soils data allowing users to access soils data in an interactive manner. The current focus is on the map unit descriptions, pedon point data, and ecological site descriptions.

The current toolset includes a Map Unit Identify Tool and a Pedon Identify Tool.





System Requirements

- ArcGIS 9.2 sp4
- .NET Framework
- Application requires administrative rights to install

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The Map Unit Identify Tool can be used on any I&M park that has been completed by the SRI. To use the tool the user simply selects a soils layer in the ArcMap table of contents, clicks a polygon of that layer, and an associated **help file** containing that map unit's description is opened.

The screenshot displays the ArcMap interface. On the left, a map shows a topographic view of a park area with various map units highlighted in yellow. A dashed line indicates a zoomed-in view of a specific map unit. The main window on the right shows the 'Map Unit Description' for '106-Chalone-Firststier-Highpeaks - complex, 60 to 70 percent slopes'. The description includes the following sections:

- Setting**
 - Elevation: 969 to 3300 feet
 - Mean annual precipitation: 17 to 19 inches
 - Mean annual air temperature: 53 to 57 degrees F
 - First-frost period: 181 to 210 days
- Composition**
 - Clstone and similar soils: 35 percent
 - Ferrioxide and similar soils: 35 percent
 - Highpeaks and similar soils: 28 percent
 - Clomuldar mta concretion: 10 percent
- Description of Chalone soils**
 - Setting**
 - Landform: Back slope hills
 - Landform position (two-dimensional): Backslope
 - Landform position (three-dimensional): Side slope
 - Down-slope shape: Convex
 - Across-slope shape: Linear
 - Aspect: representative: North
 - Aspect - range: Northwest to northeast (dichotous)
 - Slope range: 60 to 70 percent
 - Parent material: Residual soil weathered from gneiss
 - Drainage class: Well drained
 - Properties and Qualities**
 - Depth to restrictive feature: 28 to 35 inches to lithic bedrock
 - Shrinkage capacity (at natural water content): Moderately high
 - Flooding frequency: None
 - Standing frequency: None
 - Depth to water table: More than 72 inches
 - Saltiness maximum: Not saline
 - Saltinity maximum: Not saline
 - Calcium carbonate equivalent percent: No carbonates
 - Available water capacity (surface profile): Very low (about 1.8 inches)
 - Interpretive Groups**
 - Land capability subclass (unimproved): 7c
 - Land capability subclass (improved): 7e
 - Ecological site: Upper, north-facing slopes 17-19 p.u. (RHS08NCA)
 - Typical Profile**
 - A1-0 to 3 inches, very gravelly heavy coarse sand
 - A2-3 to 8 inches, very gravelly coarse sandy loam
 - Bw-8 to 20 inches, very gravelly coarse sandy loam
 - R-20 to 33 inches, bedrock



Why is the map unit description and the NPS Map Unit Identify Tool important?

- The map unit description is the “backbone” of the soil survey for the National Park Service. There is a wealth of information contained in the map unit descriptions that cannot always be conveyed in a single map or contained in a shapefile or feature class attribute table.
- There is a need for easier access to the available soils data, and the Map Unit Identify Tool helps to meet that need.
- It also educates park staff on the soil map unit concept and the link to the soil map unit legend

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From the map unit description, **ecological site descriptions** can be accessed via a hyperlink in the help file if there is a NRCS approved ESD Report for that map unit.

Interpretive Groups

Land capability subclass (nonirrigated): 6e

Land capability subclass (irrigated): 6e

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

Typical Profile

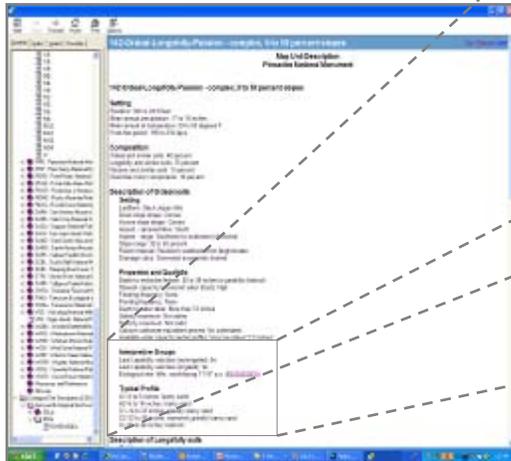
A1--0 to 6 inches; loamy sand

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



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The **Pedon Identify Tool** is currently in the early development stages. The concept is similar to the **Map Unit Identify Tool** in that a help file will be called when the user makes a selection by clicking a point in a selected layer. This will allow for more site specific information to be accessed by the user.

The screenshot displays the 'Soil Pedon Description' application. On the left, a map shows a terrain with a red dot indicating a selected location. The main window is divided into two panes. The left pane shows a tree view of 'Pedon Descriptions' with 'PINN - Pinnacles Nation' expanded to show a list of pedon IDs: PINN001, PINN015, PINN018, PINN023, PINN026, PINN074, PINN109, PINN252, PINN254, and S05CA069010. The right pane displays the detailed description for PINN015.

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

Why is the pedon data important and how is it useful?

- It allows users access to the pedon data collected in the process of a soil survey on park lands.
- It also educates users to the different types of pedon data that are collected in the process of a soil survey on park lands.





Future development goals

- We are currently exploring the use of ArcGIS Server to distribute data in an even more streamlined and user friendly manner. There are plans to develop tools similar to the previously mentioned ones in a *NPS intranet web based context*.
- This will potentially reach a wider audience, as many of our NPS units are not available on Web Soil Survey.
- *The ultimate goal is to provide easy access to all of the available soils data to NPS Staff*

