

# National Park Service

## Geologic Resources Division



# NPS Soil Resources Inventory Update



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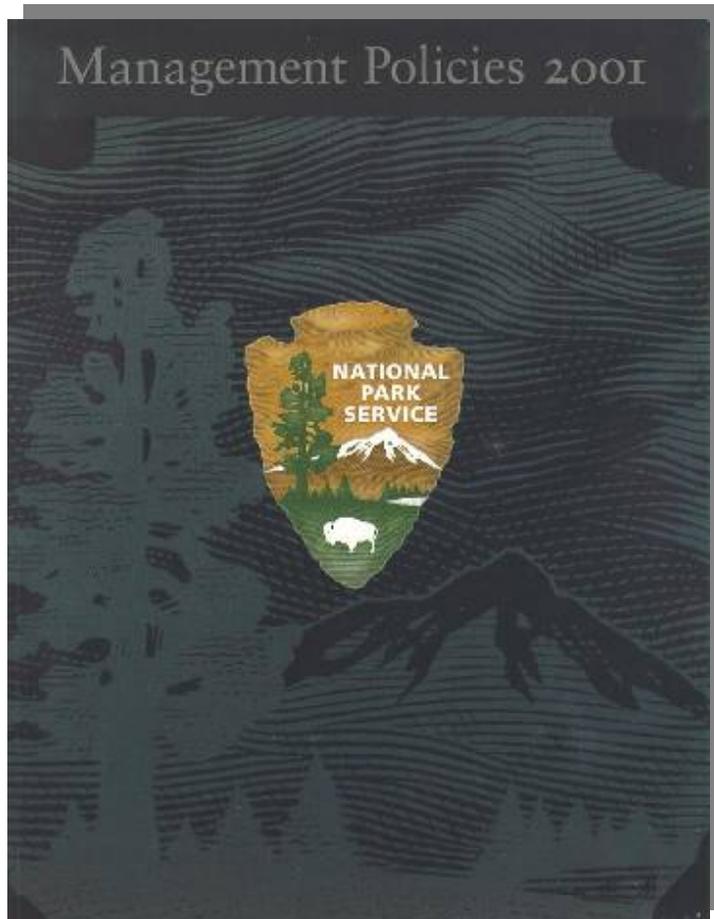
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## NPS Soil Resources Management

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- *“The Service will actively seek to understand and preserve the soil resources of parks, and to prevent, to the extent possible, the unnatural erosion, physical removal, or contamination of the soil, or its contamination of other resources”.*
- **Excerpts from, NPS Management Policies 2001, Part 4.8.2.4 - Soil Resource Management**

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## NPS Soil Resource Management Issues

- General / Resource Management Plans
- Interpretation/Information and Education
- Park Development and Maintenance
- Cultural Resources
- Disturbed Lands Program
- Restoration Projects





## NPS Soil Resource Management Issues



- Fire Management Plans/Fuel Reduction Program
- Threatened and Endangered Species
- Wetland Identification and Management
- Exotic/Invasive Plants
- Vital Signs Monitoring

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### National Level

<b>Park Acres</b>	<b>84.5 Million</b>
<b>Number of Parks</b>	<b>270</b>
<b>Acres mapped thru FY07</b>	<b>24.5 Million (29%)</b>
<b>Parks mapped thru FY07</b>	<b>140 (52%)</b>
<b>Alaska Acres</b>	<b>54 Million (64%)</b>
<b>Alaska Parks</b>	<b>16 (6%)</b>

**Mapped = data that can be harvested from SDM**

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### NCSS Northeast Region Status

There are 955,988 acres of NPS Lands in the NE region (1.1% of total NPS acres). That acreage comprises 53 parks or 19.6% of the total number of parks in the country.

Through FY07 26 parks in the NE have “harvestable” soils data. Those 26 parks comprise 180,064 acres (19% of NPS acreage in the NE region) and 49% of the total park number in the NE.

NPS counts parks not acres

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## NCSS Northeast Region Status

- **Interagency Agreement is currently in place with NRCS addressing 3 parks in WV, covering 88,000 acres (Bluestone National Scenic River, Gauley River National Recreation Area, New River Gorge National River)**
- **These parks have been set up as new non-MLRA soil survey areas and will be available on Web Soil Survey**
- **Have interest in setting up Shenandoah National Park as a new non-MLRA soil survey area, as it currently resides within 8 different soil survey areas, never mapped to meet NPS needs, and not available on Web Soil Survey**

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## Opportunities for NPS Partnerships

- Interested in participating with MAPCOAST to pursue mapping of subaqueous soils in many of the NPS units in the NE Region
- NPS has been working with NCSS partners in other projects on our coastal parks to meet management needs



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### Subaqueous Soils on Wind Tidal Flats at Padre Island National Seashore, Texas

Set up 2 new soil series (Satatton, Tatton) and one new ecological site description (Wind Tidal Flat - R150BY716TX) to support management needs and ecological significance to the Park that would not be addressed as a "Miscellaneous Area"



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Beaches were investigated and 4 different map units were developed based upon different parent materials ( big shell, little shell, mineral, etc.) as well as potential management issues such as trafficability.



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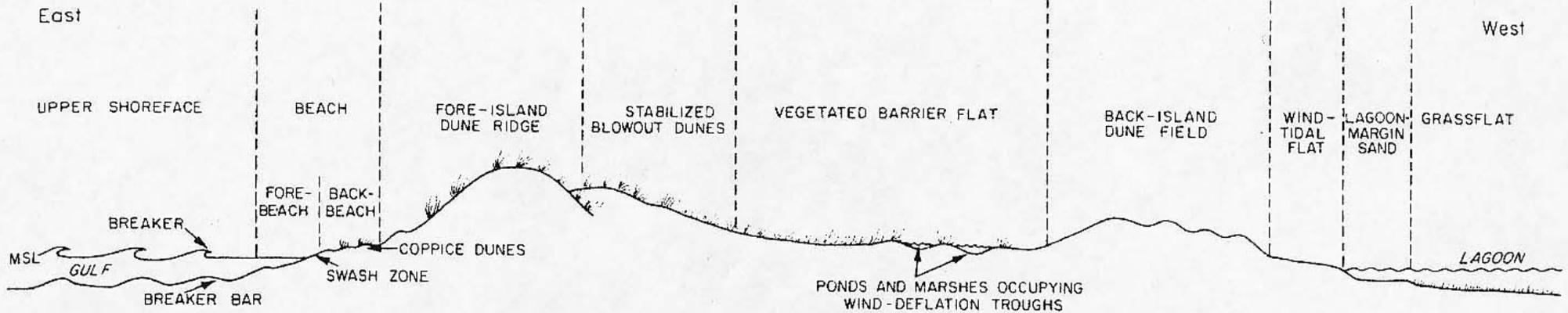


Figure 2. Generalized cross section of north Padre Island environments, from the Gulf shoreline to Laguna Madre (modified from McGowen and others, 1977).

A landform/soil classification/vegetative/hydrologic classification and characteristics genetic key was developed to not only to familiarize the soil scientists with the soils as they occur across the landscape, but will also be available to all users to help them visualize how these things are changing across a dynamic landscape.

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### Climate, Landscape, Parent Material, and Vegetation Padre Island National Seashore

Map symbol and Soil Name	Slope	Elevation	MAP	MAAT	Frost Free Days	Landscape	Landform	Parent Material	Ecological Site	Characteristic Native Vegetation	Composition	
											Forestland	Rangeland
291: Mustang-----	pct 0-1	ft 0-5	in 25-35	F 71-73	310-350	barrier island	barrier flat on barrier island	sandy eolian and storm washover sediments of Holocene age	LOW COASTAL SAND PE 31-44 R150BY650TX	bushy bluestem  gulfdune paspalum  marshhay cordgrass  other perennial  forbs  other perennial  grasses  scribner's panicum  seacoast bluestem  seashore dropseed  sedge		5 10 30 10  5   5 5 5 25 pct
Padre-----	pct 0-2	ft 3-10	in 25-35	F 71-73	310-350	barrier island	low dune on barrier flat on barrier island	sandy eolian and storm washover sediments of Holocene age	COASTAL SAND PE 31-44 R150BY648TX	broomsedge bluestem  brownseed paspalum  false indigo  gulfdune paspalum  marshhay cordgrass  other perennial  forbs  other perennial  grasses  partridge pea  scribner's panicum  seacoast bluestem	pct	5 5 5 10 5 15  5  5 5 40

A corresponding report was also developed from NASIS data to show these geomorphic and ecological relationships.

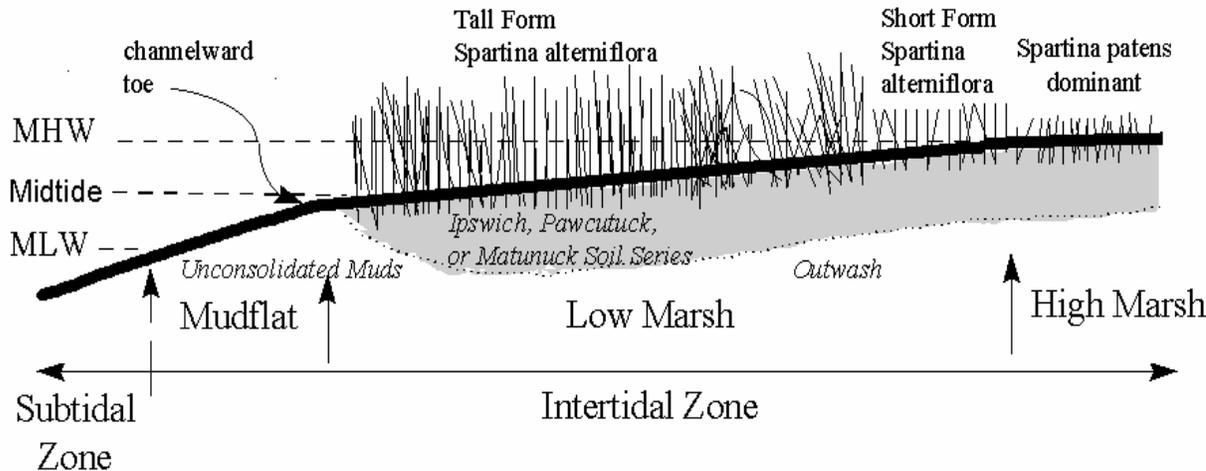
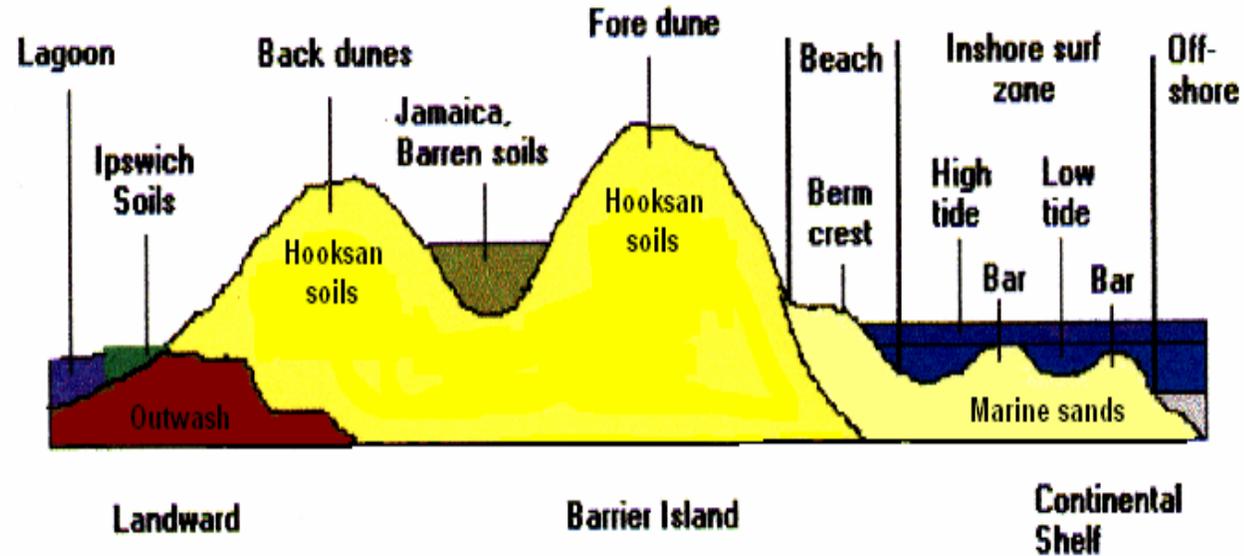
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### Gateway NRA- Sandy Hook Unit

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## NPS Soil Resource Inventory Staff

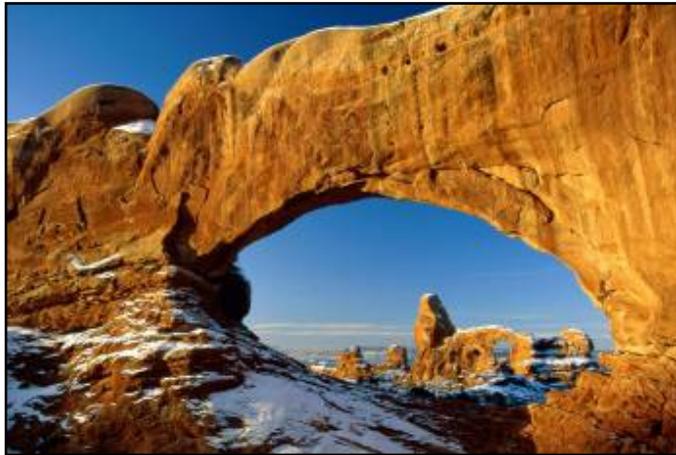
**Pete Biggam - Soils Program Manager**

**Judy Daniels - Data Manager**

**Branon Barrett – GIS Specialist**

**Troy Kashon – GIS Specialist**

**Sue Southard – NRCS/NPS Liaison**



Part of liaison role is to help parks understand soils....

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### 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.

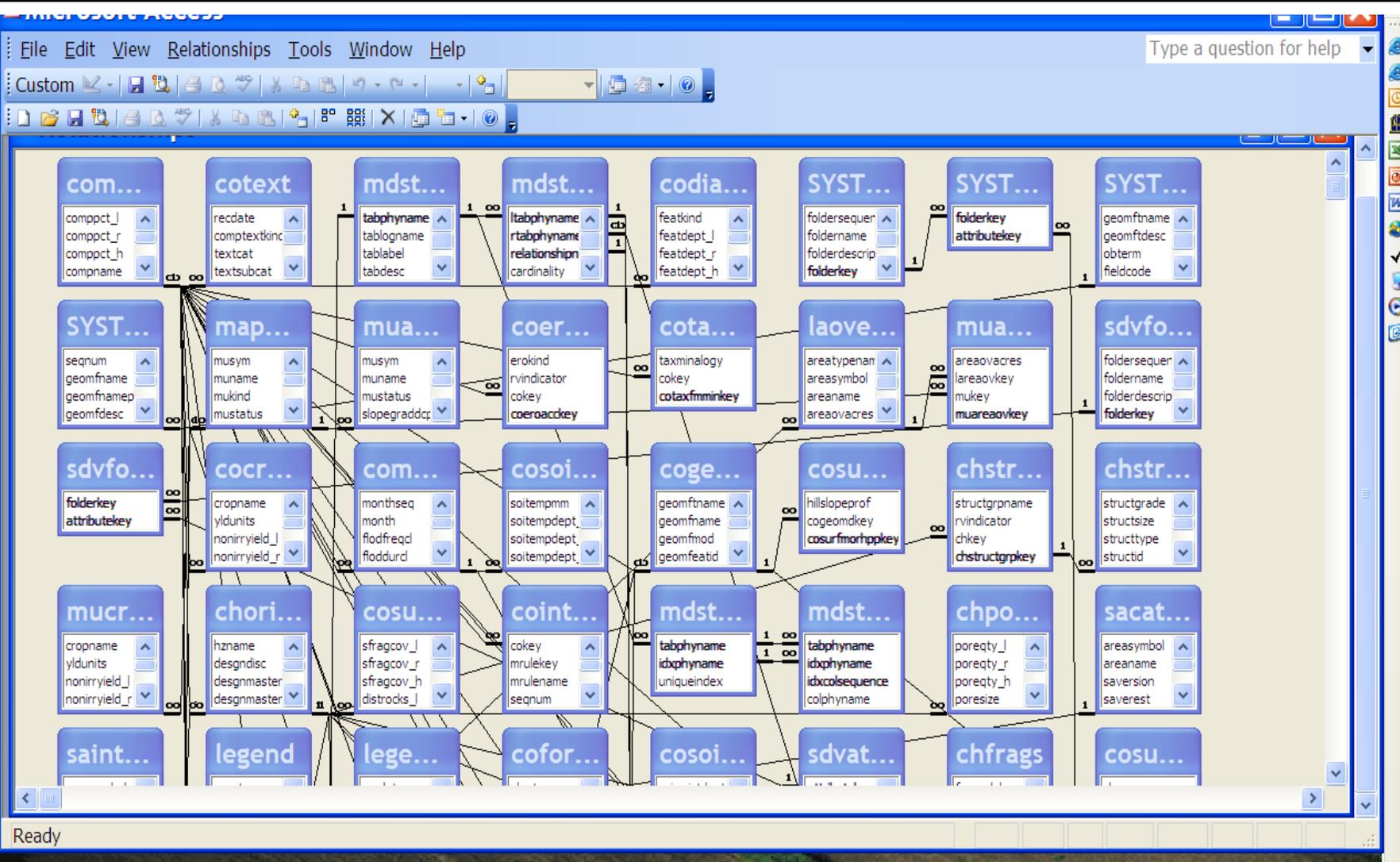
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Ready

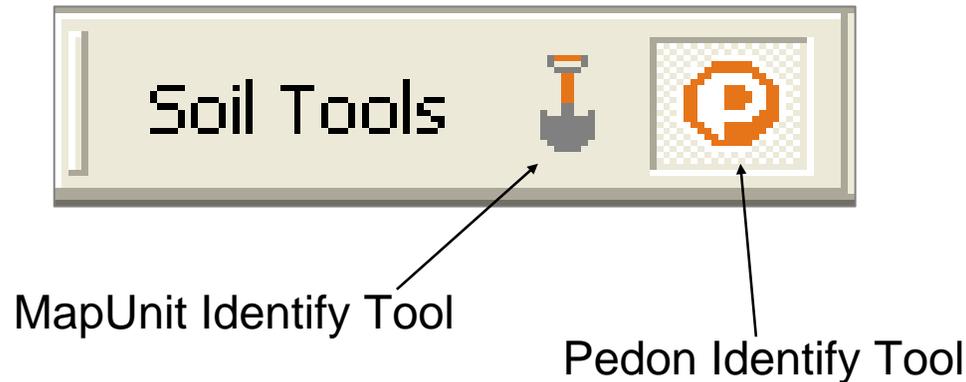
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The SRI is currently developing an ArcGIS Desktop toolset that will geospatially link soils data allowing users to access soils data in an interactive manner. The current focus is on the map unit descriptions, pedon point data, and ecological site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



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The MapUnit 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 image displays two windows from the ArcMap software. The left window shows a topographic map of Pinnacles National Monument with a yellow polygon highlighting a specific area. The right window is a detailed description for the map unit '105-Chalone-Firststister-Highpeaks - complex, 50 to 70 percent slopes'.

**Map Unit Description**  
Pinnacles National Monument

**105-Chalone-Firststister-Highpeaks - complex, 50 to 70 percent slopes**

**Setting**  
Elevation: 968 to 3360 feet  
Mean annual precipitation: 17 to 15 inches  
Mean annual air temperature: 55 to 51 degrees F.  
First-frost period: 190 to 210 days

**Composition**  
Chalone and similar soils: 35 percent  
Firststister and similar soils: 35 percent  
Highpeaks and similar soils: 28 percent  
Disumbar minor components: 10 percent

**Description of Chalone soils**

**Setting**  
Landscape: Back slopes hills  
Landscape position (two-dimensional): Backslope  
Landscape position (three-dimensional): Side slope  
Down-slope shape: Convex  
Across-slope shape: Linear  
Aspect - representative: North  
Aspect - range: Northwest to northeast (abochine)  
Slope range: 50 to 73 percent  
Parent material: Residual weathered fine tephrite  
Drainage class: Well drained

**Properties and Qualities**  
Depth to restrictive feature: 20 to 28 inches to 140c bedrock  
Soilwater capacity to transmit water (Root): Moderately high  
Flooding frequency: None  
Ponding frequency: None  
Depth to water table: More than 72 inches  
Salinity maximum: Not saline  
Sodicity maximum: Not sodic  
Calcium carbonate equivalent percent: No carbonates  
Available water capacity (entire profile): Very low (about 1.8 inches)

**Interpretive Groups**  
Land capability subclass (intergraded): 7e  
Land capability subclass (ungraded): 7e  
Ecological site: Upper, reentracing slopes 17-19' (p.e.) (R150101CA)

**Typical Profile**  
A1-0 to 3 inches; very gravely loamy coarse sand  
A2-2 to 8 inches; very gravely coarse sandy loam  
Bw-8 to 20 inches; very gravely coarse sandy loam  
R-20 to 23 inches; bedrock

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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. [\(R015X100CA\)](#)

### Typical Profile

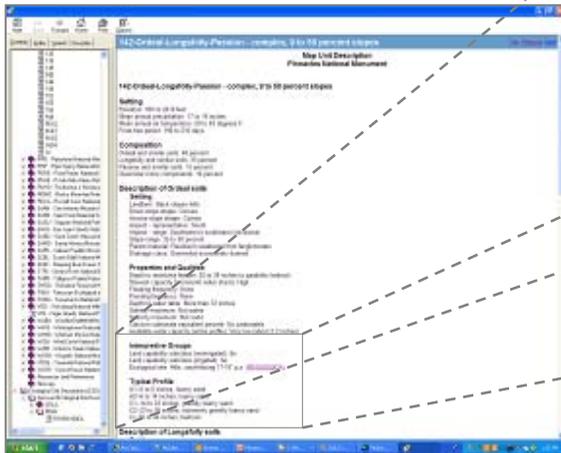
A1-0 to 6 inches; loamy sand

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



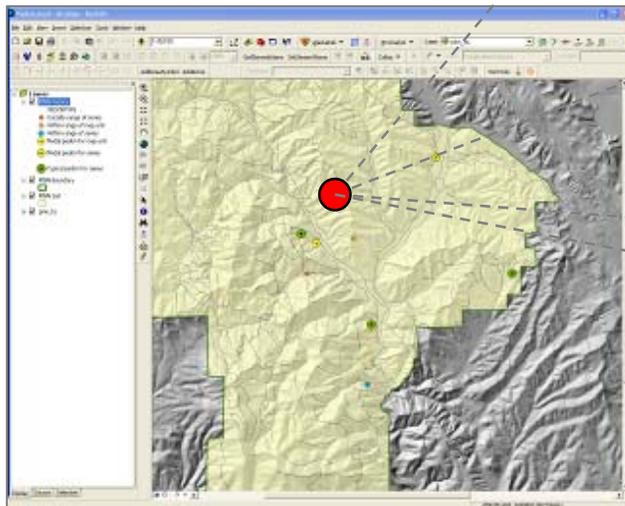
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The Pedon Identify Tool is currently in the early development stages. The concept is similar to the MapUnit Identify Tool in that a help file will be called when the user makes a selection by clicking a point in a selected layer. This will allow for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



**Soil Pedon Description**

Hide Back Forward Home Print Options

Contents Search Favorites

Pedon Descriptions  
Error: There is no Pedon  
PINN - Pinnacles Nation  
PINN001  
PINN015  
PINN018  
PINN023  
PINN026  
PINN074  
PINN109  
PINN252  
PINN254  
S05CA069010

**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

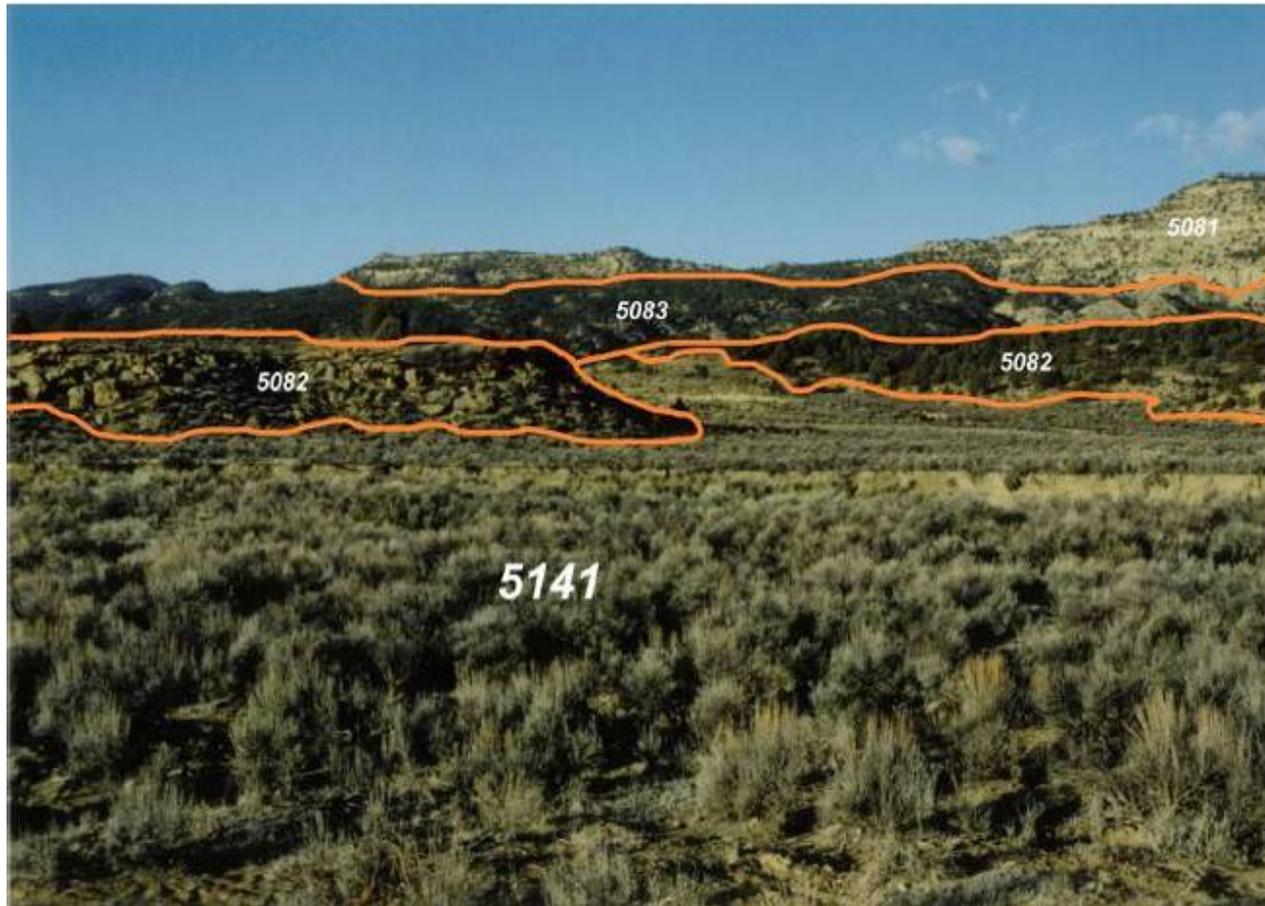
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# Photo Documenting Map Units



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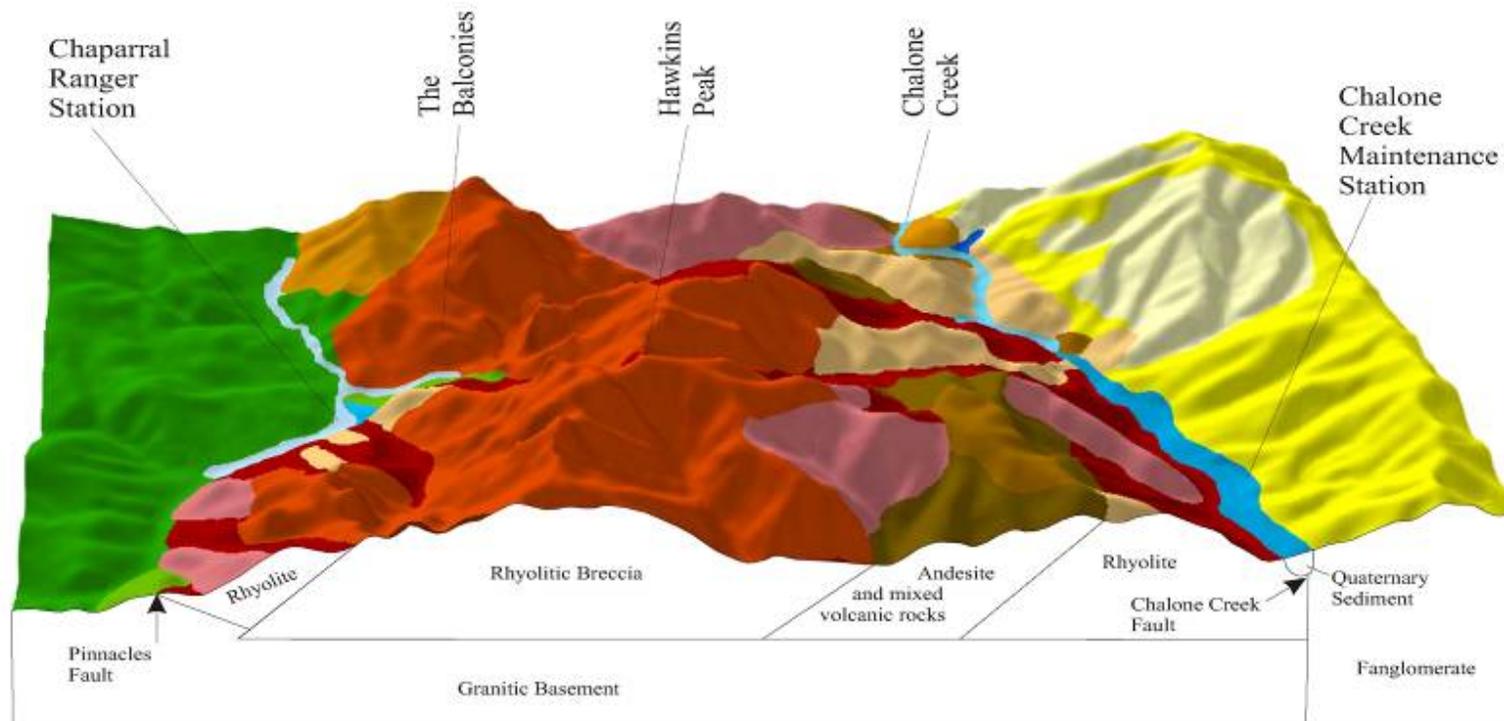
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# Use of Geospatial Tools and Map Units

**Block Diagram Relating Soils, Landforms, and Geology**



Conceptual representation of geology. Vertical exaggeration 1.5:1.



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## What's Cool About Our Park Soils?

- Integrating soil science into park educational material
- Emphasis on soils as the dynamic interface between “rock and plant”



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## Why is the pedon point 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.
- Used by other disciplines, such as archeologists, ecologists

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# What's Cool About Our Park Soils?

Series Type Locations – accurately populated in NASIS pedon

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

Endemic Soils - Unique to park – mapped nowhere else ...a park story to tell !

Benchmarks – what an opportunity to preserve a site!

Soil Monoliths – for visitor center display

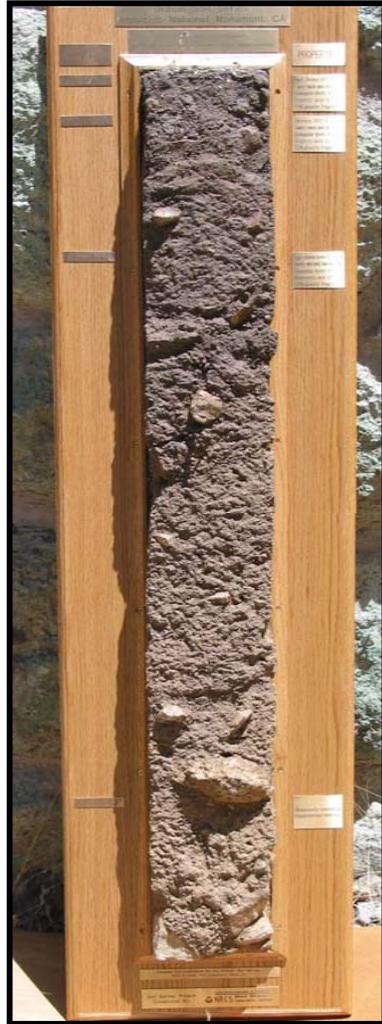


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## Soil Monoliths

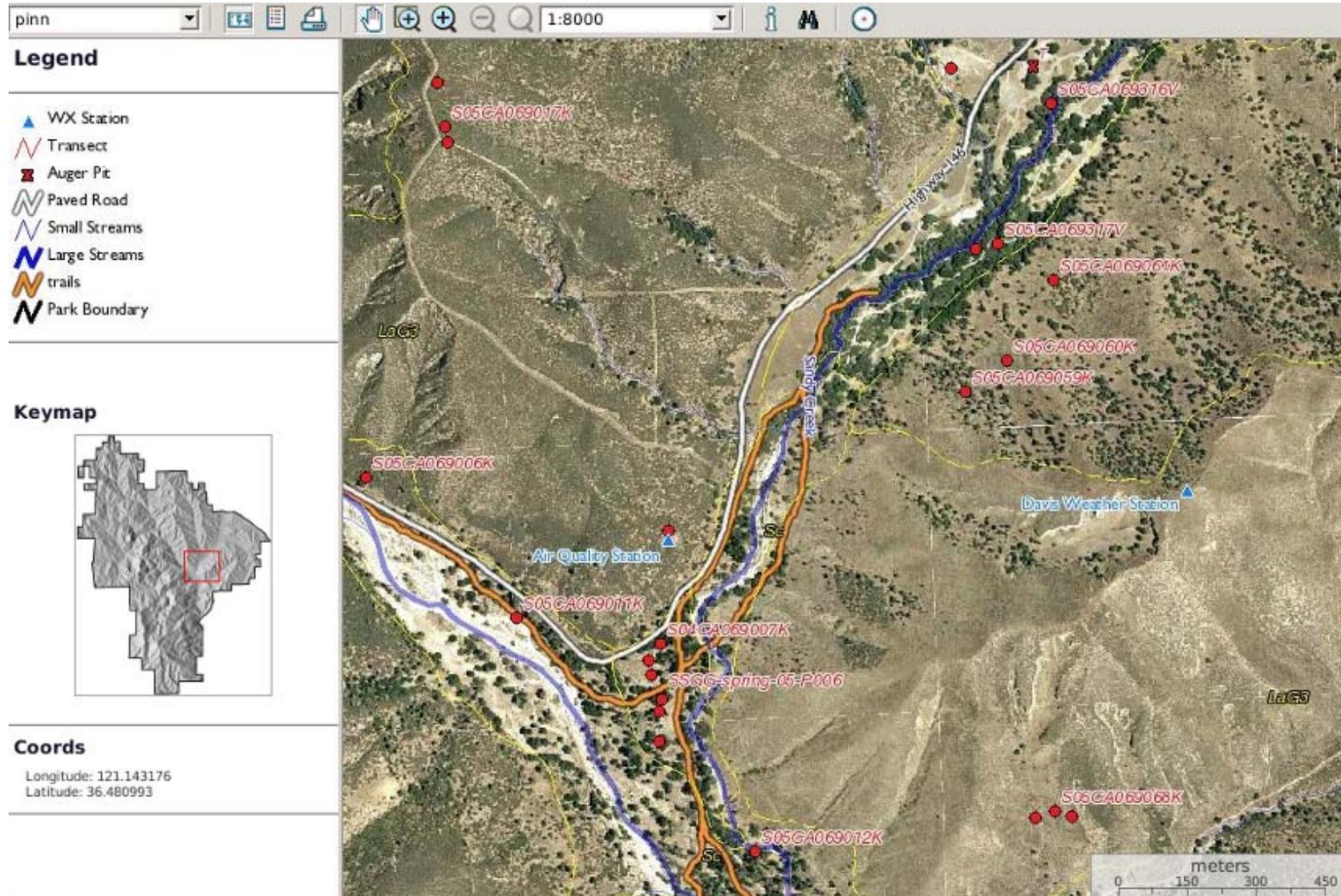


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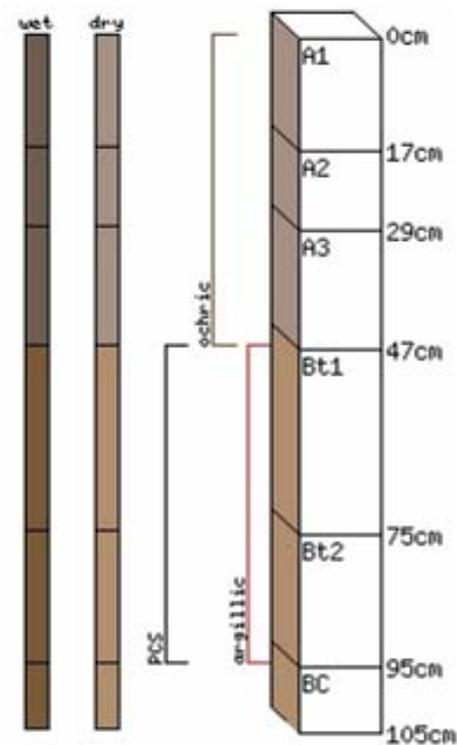
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05CA069081K  
S05CA069286V  
S05CA069285V

S05CA069283V  
S05CA069284V

S06CA069232

### S06CA069232



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

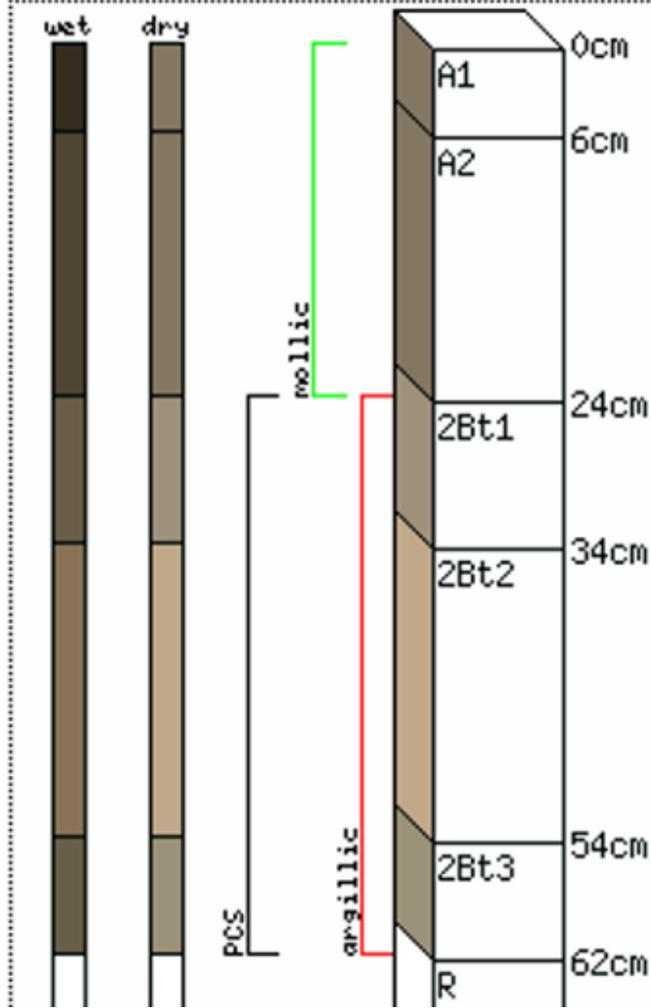
Directions: [To here](#) - [From here](#)

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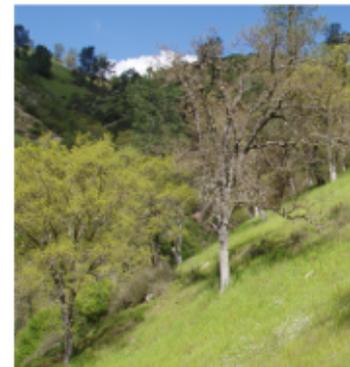
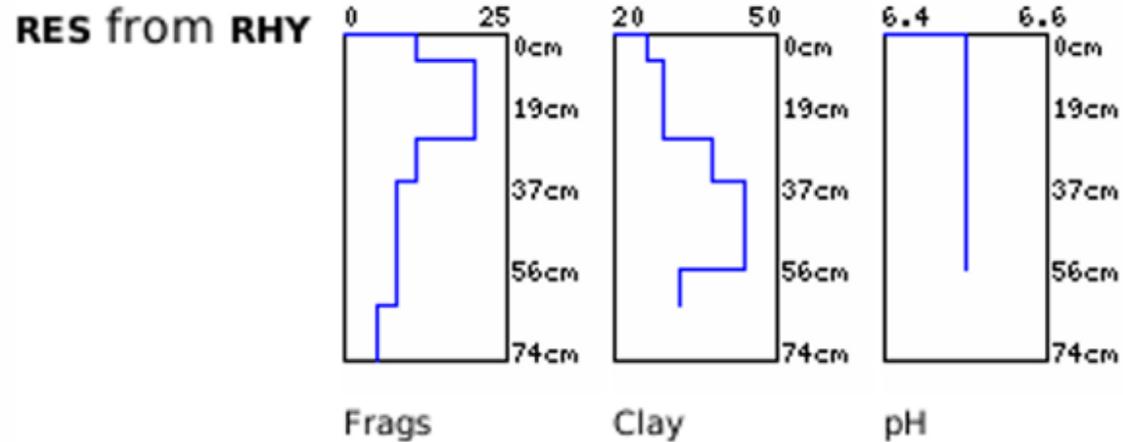
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[S04CA069002K Hzn Data](#) [2004-10-20 ] [KO]  
*fine, smectitic, superactive, hyperthermic, typic argixeroll*



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How does NPS SRI Goals fit in with current Soil Survey Division Priorities?

1. Promoting TSS
2. Benchmark landscapes
3. ESDs and state and transition models

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Any questions?

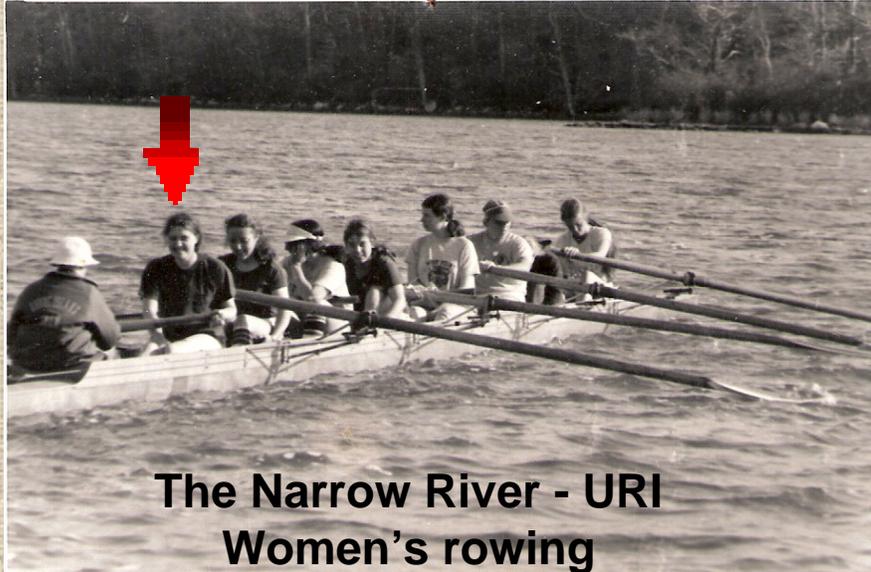
If no questions, here are historic photos from Rhode Island...

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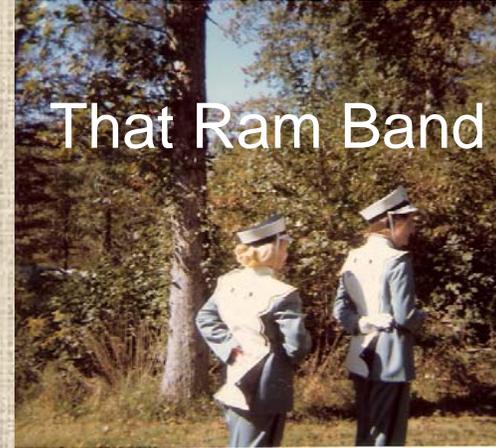
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**The Narrow River - URI  
Women's rowing**



**That Ram Band**



**On Worden's Pond**



**Narragansett Bay**