National Park Service Contributions to Soil Survey Division Priorities

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NATIONAL PARK SERVICE

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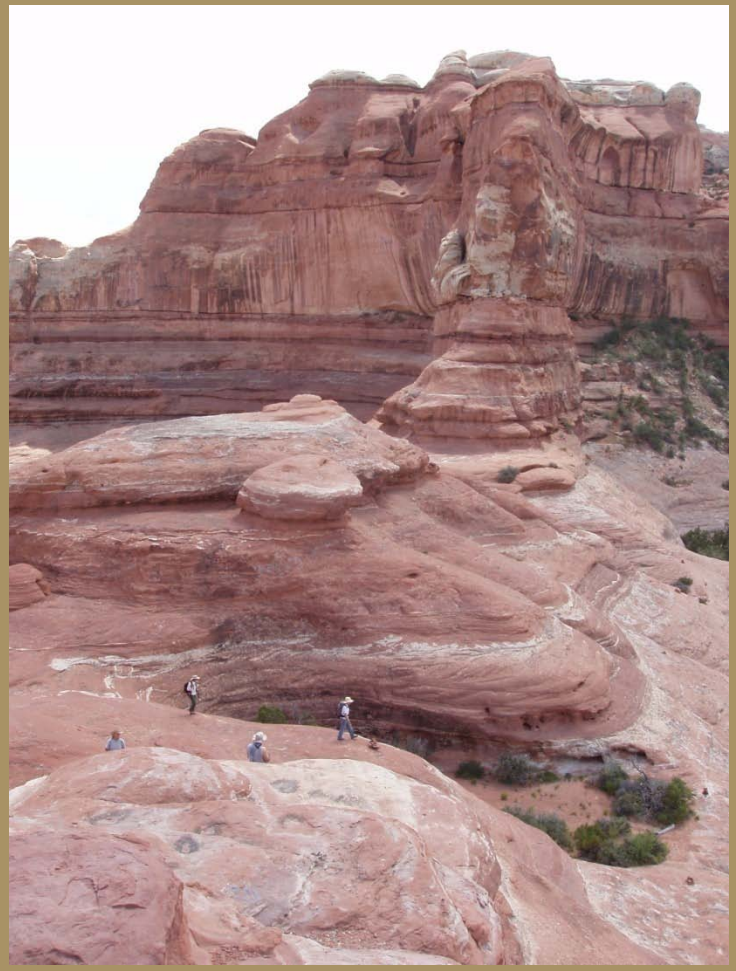
Priorities and NPS Contributions

- Completion of first-over on all lands and implementation of MLRA updates
- Soil Carbon Assessments
- Data Completeness and Correctness
- Ecological Site Development

Quiz time!

The First-over and MLRA updates



200 of 272 NPS properties now considered mapped

1. either clipped from existing SSAs or…

2. funded to be set up as SSAs (40 of the 272) and these are to be mapped as a first-over or to have a refreshed dataset

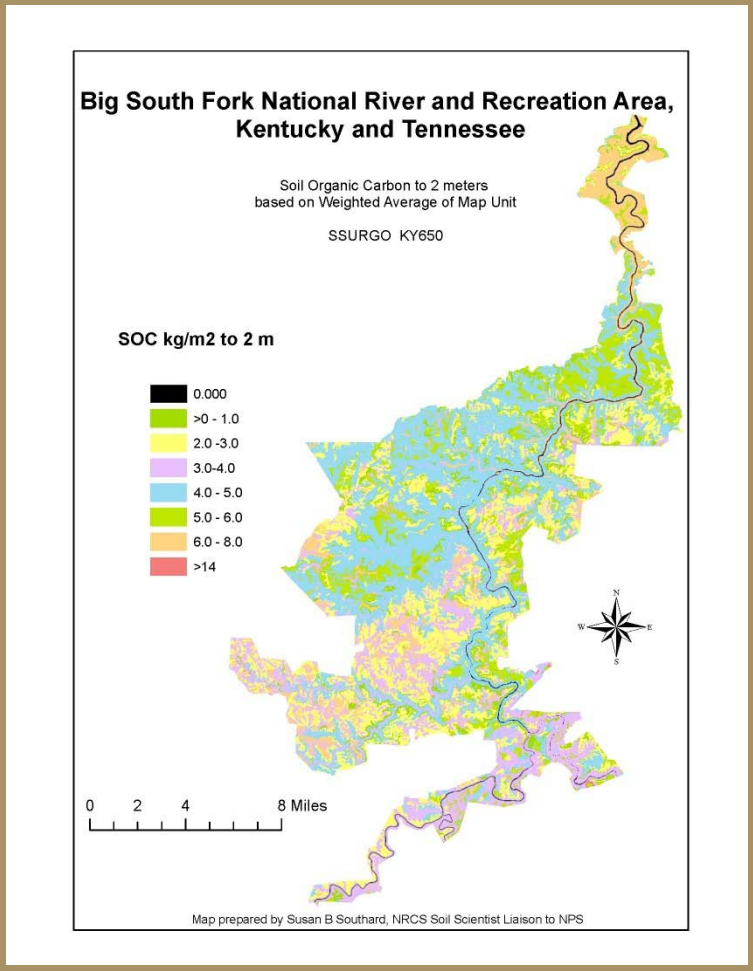
Quiz time!

The First-over and MLRA updates

- Currently there are 32 parks under interagency agreement
- States with parks never mapped - WA, AK, AZ, CA, MI
- States being funded for updates or data refreshing within park boundaries are KY, TN, WV, ID, UT, SD, NM

Quiz time!

Soil Carbon Assessments



- NPS is creating parkland soil inorganic and organic carbon stock maps and tables using queries, properties and class rules in NASIS and SSURGO exports

Soil Carbon Assessments

- Any state can run the NPS SOC or SIC class rules to review data internally or to include for a SSURGO export
- Rules uses an evaluation curve designed such that the interp value is in megagrams (because of NASIS Boolean logic 0 to 1);
- So, rule value *1000 = kg/m2 total SOC/SIC to 2 meters

DRAFT NPS Total Soil Carbon ACCESS Report

Great Basin National Park, Nevada

[Total Soil Carbon is soil organic carbon (SOC) and soil inorganic carbon (SIC).

Soil organic carbon is carbon (C) in soil that originated from a biological source, such as plants or animals. SOC is converted from soil organic matter (SOM) stored in the database.

Soil inorganic carbon is carbon found in soil carbonates, usually as calcium carbonate layers in the soil or as clay-sized fractions throughout the soil. SIC is converted from calcium carbonate ($CaCO_3$) stored in the database. Carbonates in soils are found in areas where evaporation rates exceed precipitation as is the case in most desert environments. Usually the soil carbonates accumulated from carbonatic dust or from solution when wetter climates existed.

The SOC and SIC for the whole soil (which includes particles greater than 2mm) is calculated by adjusting the volume that is taken up by rock fragments. Both the SOC and SIC weight is converted to a mass basis by multiplying the weight by the density of the soil. A weighted average of the whole soil is determined by multiplying the SOM and $CaCO_3$ mass in each horizon by the horizon thickness then dividing by the entire depth of the observed soil. The total value of SOM is then converted to SOC. A conversion of 58% is used to convert from SOM to SOC. A conversion of 12% is used to convert $CaCO_3$ to SIC. Lack of a value in a column indicates the calculation was not performed for that soil. This report shows only the major soils in each map unit]

Map symbol and soil name	Pct. of map unit	Soil Organic Carbon	Soil Inorganic Carbon
		kg/m2	kg/m2
1650:			
Noski	35	2.6	14.5
Cedarcabin	25	5.4	50.6
Noski	25	2.6	14.5
1652:			
Noski	35	2.6	14.5
Canyonfork	30	4.7	30.3
Cedarcabin	25	3.8	21.6
1700:			
Eenreed	40	3.4	5.4
Millan	30	3.4	0
Eenreed	15	3.4	5.4
1900:			
Borvant	90	0.9	13.5
2000:			
Closkey	85	4.8	0
2101:			
Radol	40	2	5.4

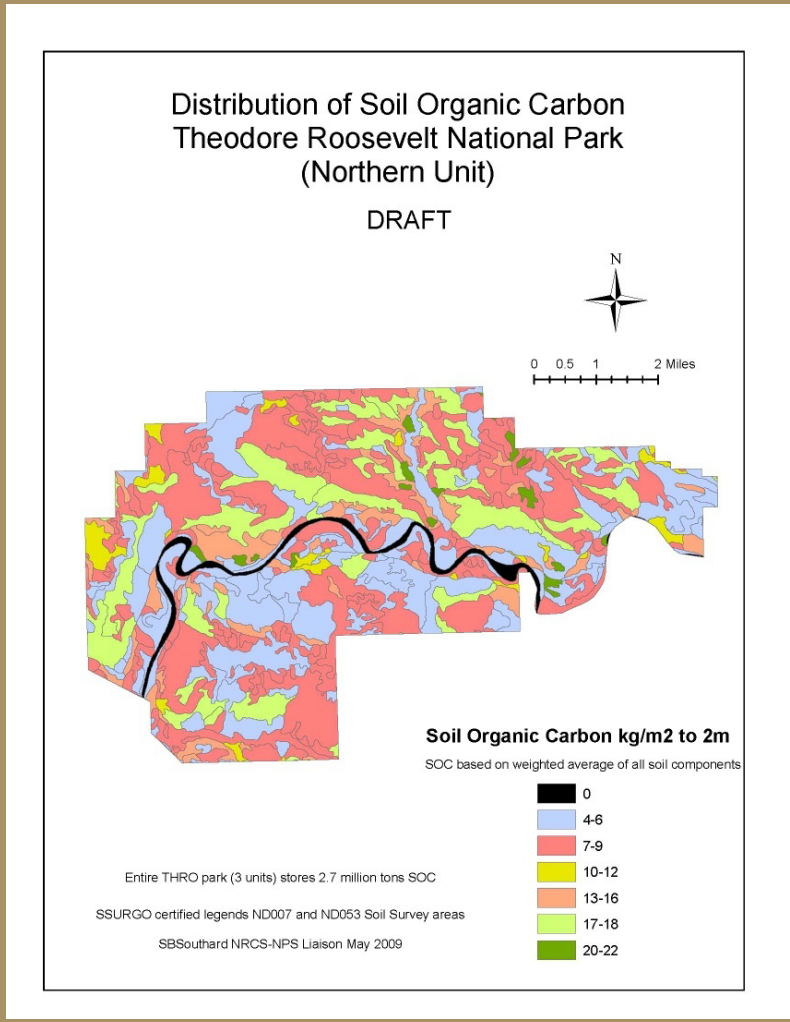
Soil Carbon Assessments

- NPS has slightly different reasons for C assessments

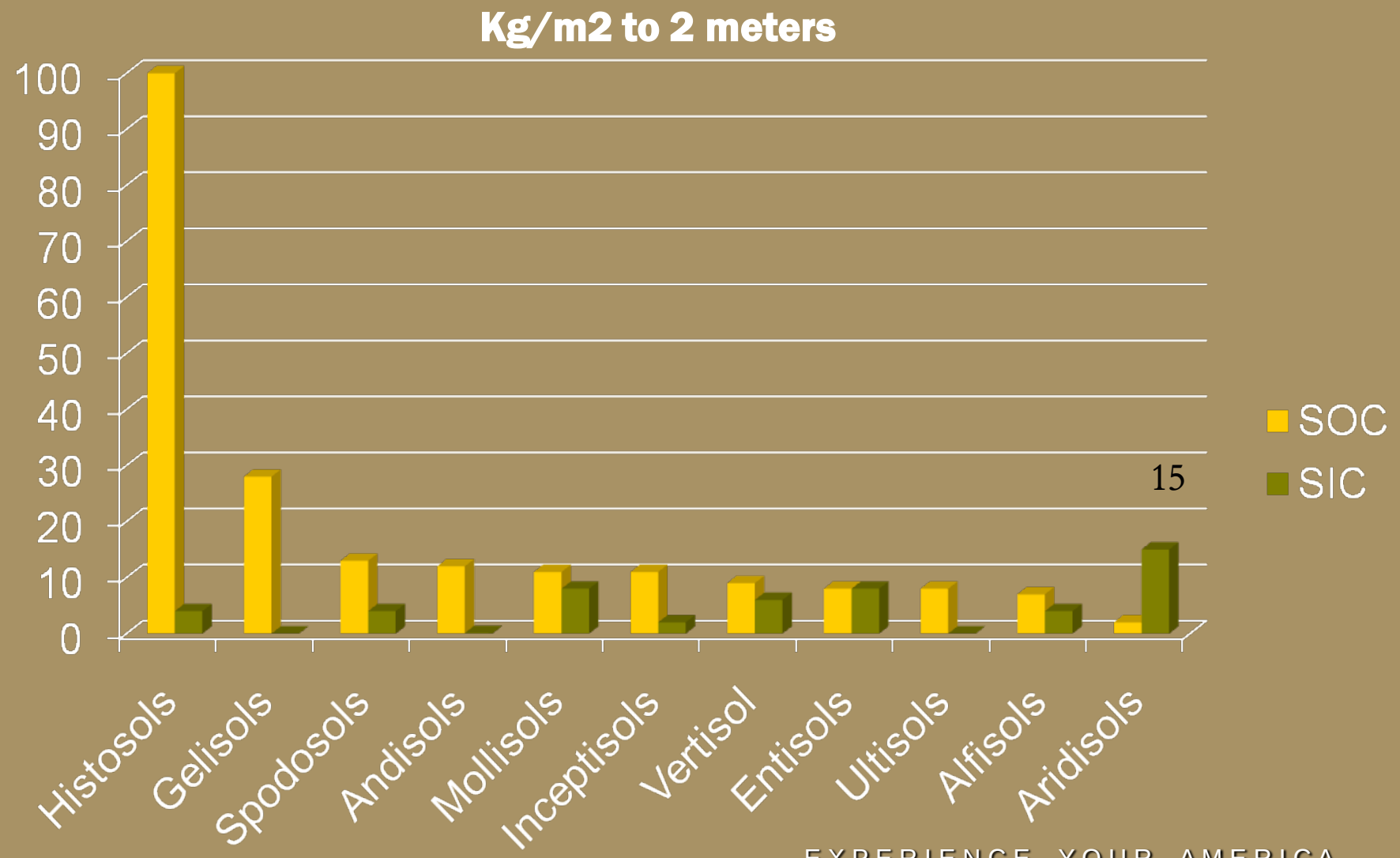
1. Education – NPS role in translating nature to visitors (aka taxpayers!)

2. Political – reason for existence and park expansion

3. Restoration – justifications/prioritization

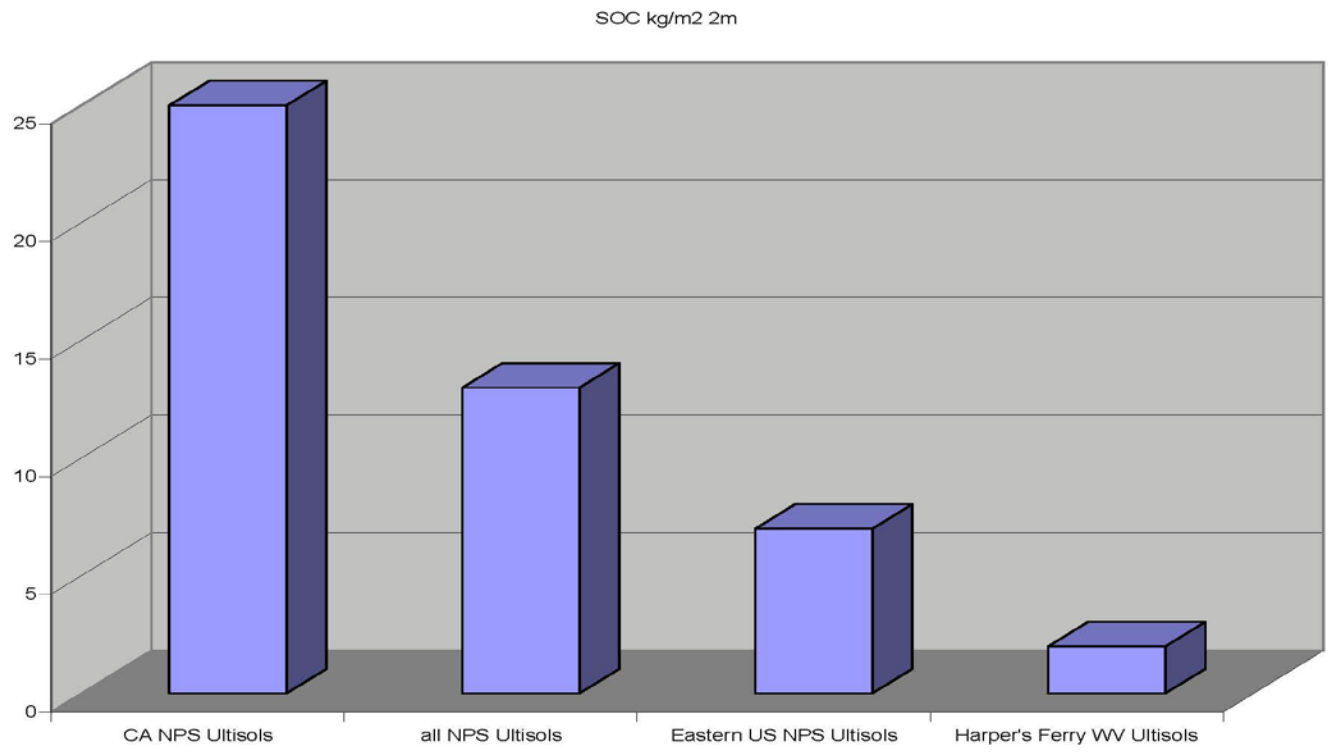


Soil Carbon Assessments



Soil Carbon Assessments

Overlap query: SOC by SOIL ORDER on NPS Lands



Soil Carbon Assessments

- Due to cooperation of SSS states now have NPS tabular data tagged in NASIS through use of overlaps (for the 200 parks) that allows for this kind of data analysis Thank you!

- Same process of querying can be used for any numerical property besides carbon, and on all lands

Soil Carbon Assessments

Soil Climate and SOC Map Unit Wtd average

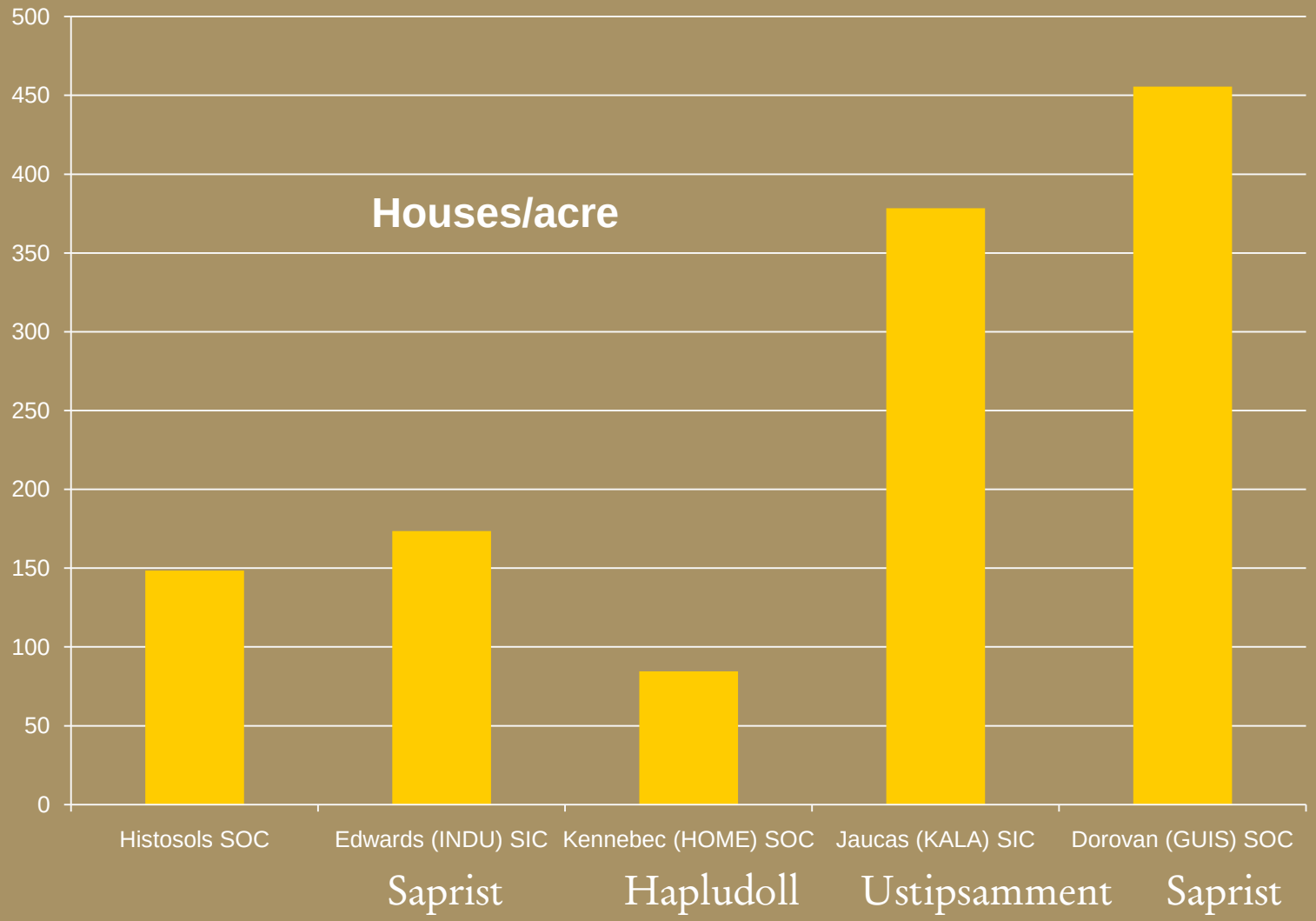
Park	SOC tons/acre	Soil Climate
Hawaii Volcanoes NP Hawaii	10	Isohyperthermic perudic
Harper's Ferry NHS West Virginia	17	Mesic udic
Theodore Roosevelt NP North Dakota	34	Frigid ustic
Acadia NP Maine	128	Frigid udic and aquic

Soil Carbon Assessments by Map unit

6,000 board-ft in 2,000 ft² house with 1# C per board-ft = 3 Tons C in a house

Park	SOC tons/acre Map unit wt av	Carbon equivalent by Houses per acre stored in soil
Hawaii Volcanoes NP Hawaii	10	3.3
Harper's Ferry NHS West Virginia	17	5.6
Theodore Roosevelt NP North Dakota	34	11.3
Acadia NP Maine	128	42.6

Soil Carbon Assessments by comp



Data Correctness and Completeness

- Bulk density
- Component restriction NULL when it should not be NULL
- Passing 10 sieve – 0
- NULL CEC ECEC
- RF vol vs RF weight

Data Correctness and Completeness

			SOC
Psamment (in NASIS)	3 cm Oi	1.55 BD	24.0 kg/m2
Psamment (edited)	3 cm Oi	0.20 BD	16.0 kg/m2 36 tons/acre error
Xerorthents (in NASIS)	2 cm Oi	1.55 BD	24 kg/m2
Xerorthents (edited)	2 cm Oi	0.10 BD	19 kg/m2 22 tons/acre error

Data Correctness and Completeness

1. Sieves not populated but RF volumes are…

2. Sieves populated but RF volumes are not…

3. Both populated but no relationship between the two

Solution: Since rf volume is a "determinant null" I had to write in a condition in SOC/SIC calculation SQL that when determining RF vol by horizon, if sieves not null, then use sieves else use RF volume. If both are populated, still use the sieves.

Data Correctness and Completeness

- Challenges – How to proceed when data issues are found…feedback from you all!

Data Correctness and Completeness

Using Interpretations to review data is not easy

- Arbitrary class limits and rule rating classes make QA/QC of properties associated with interpretations difficult

"Slope"

"Depth to rock"

"Rock fragments"

"Carbonate content"

"Too sandy"

"Droughty"

Data Correctness and Completeness

Tools

NASIS properties are the limiting features of base rules used in Interpretations

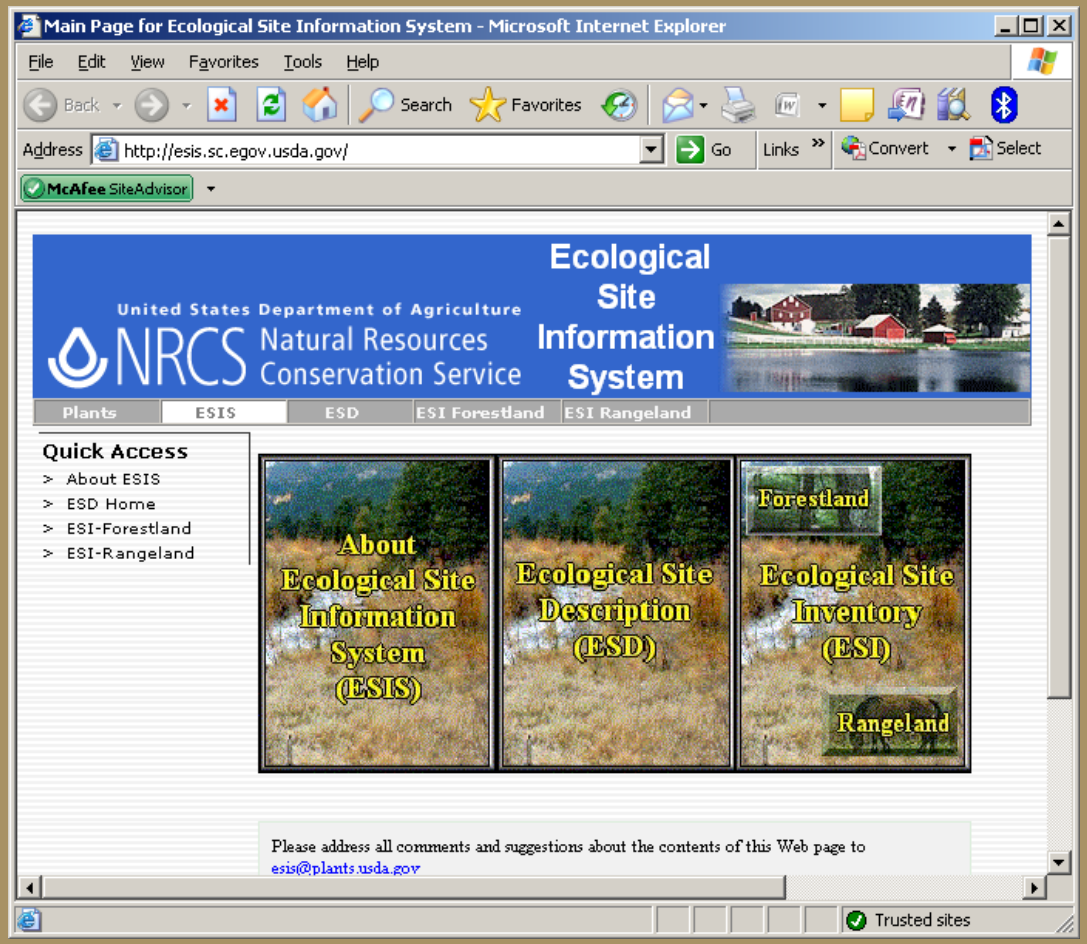
NPS - DATA EXPORT Prop results rv all comps

NPS - DATA EXPORT Prop rv all comps wtav of MU base 100%

NPS – DATA EXPORT Organic Carbon QA/QC data elements

Ecological Site Descriptions

- NPS managers eyes light up when they see these….
- Helps make sense of landscapes and the importance of soil properties in the whole ecosystem



Ecological Site Descriptions

Web Soil Survey - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

Intro to Soils | Suitabilities and Limitations for Use | Soil Properties and Qualities | Ecological Site Assessment | Soil Reports

Search

Ecological Sites

Open All | Close All

All Ecological Sites

R022BI200CA — Talus slope

This Ecological Site

Talus slope shrubland with scattered trees, forbs, and grasses 1.1

Talus slope with low herbaceous cover and regenerating shrubs and trees 1.2

R022BI201CA — Bedded Tephra Deposits

R022BI202CA — Frigid alluvial flat

R022BI203CA — Moderately deep fragmental slopes

R022BI204CA — Glaciated mountain slopes

R022BI205CA — Cirque floor

R022BI206CA — Cryic lacustrine flat

R022BI207CA — Alpine slopes

R022BI208CA — Cryic pyroclastic cones

This Ecological Site

View Ecological Site Info

View Options

All Plant Community Photos

State Transition Diagram

Ecological Dynamics Description

View Ecological Site Info

1.1 Shrubs, forbs, and grasses.

1.2 Barren with few shrubs, forbs, and grasses

R022BI209CA — Loamy seeps

R022BI210CA — Loamy flood plains

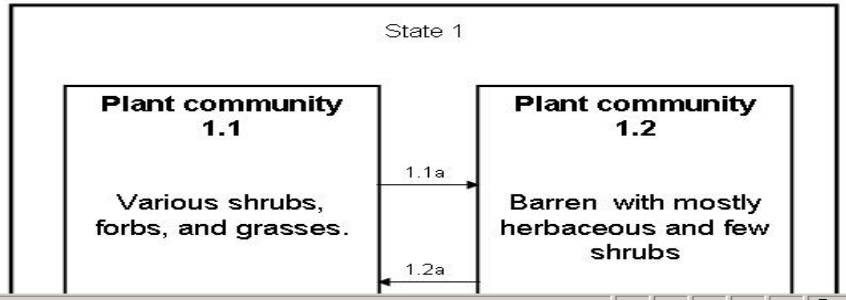
R022BI211CA — Spring complex

All Plant Community Photos — R022BI208CA — Cryic pyroclastic cones Ecological Site

1.1 Shrubs, forbs, and grasses.

State Transition Diagram for R022BI208CA — Cryic pyroclastic cones Ecological Site

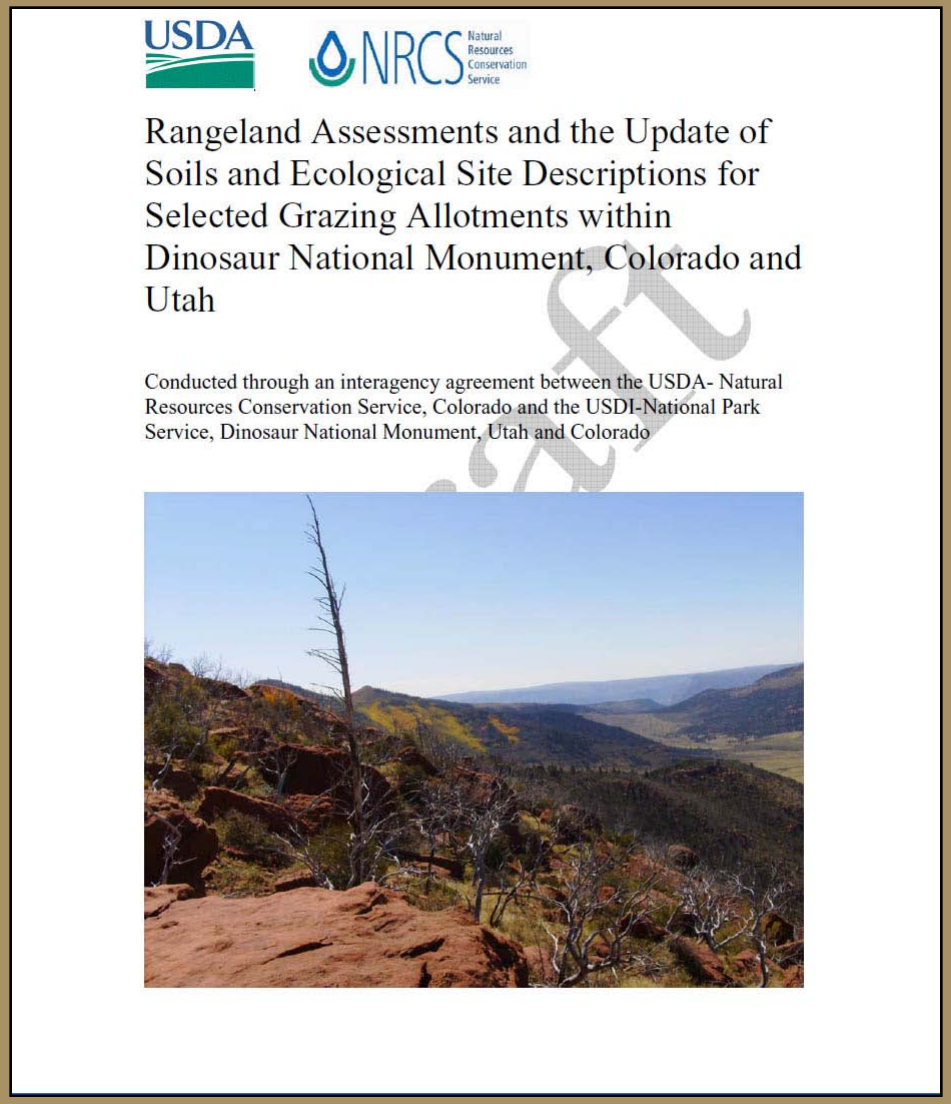
R022BI208CA-Cryic Pyroclastic Cones



Done

Trusted sites

Ecological Site Descriptions


USDA NRCS Natural Resources Conservation Service

Rangeland Assessments and the Update of Soils and Ecological Site Descriptions for Selected Grazing Allotments within Dinosaur National Monument, Colorado and Utah

Conducted through an interagency agreement between the USDA- Natural Resources Conservation Service, Colorado and the USDI-National Park Service, Dinosaur National Monument, Utah and Colorado

Example: The soil survey data and ecological site descriptions, along with detailed rangeland assessments, are being used for the ongoing Grazing Management Plan at Dinosaur National Monument , UT-CO

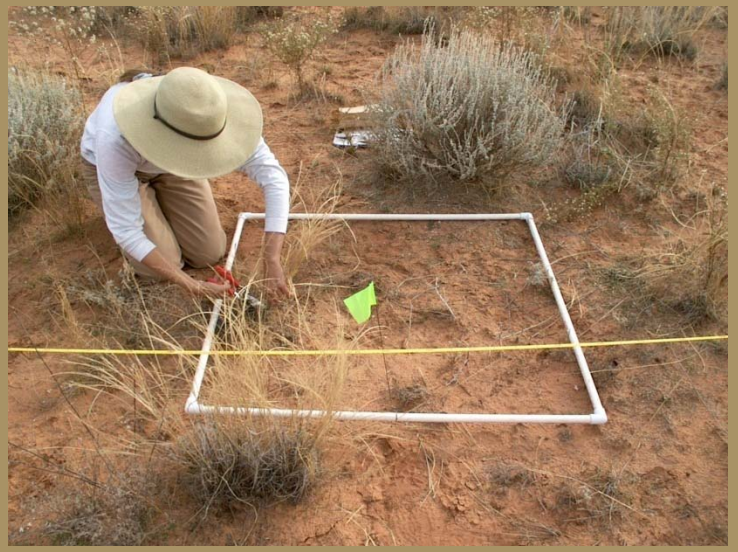
Ecological Site Descriptions

Challenges:

- Hunt and peck routine…not always in ESIS
- Inconsistencies in delivery and completion level in NPS agreements
- ESDs often delivered as draft WORD documents (do we give out draft SSURGO? No)

Solutions:

- $$$$
- Training
- Pipeline and standards



Ecological Site Descriptions

- Suggestions:

1. State and transition models - include not only vegetation management pathways but soil management pathways (example: soil carbon)

2. Create or strengthen section in ESD on soil indicators – soil climate, mineralogy influences, soil depth, AWC and reference soil mapping assumptions

Summary

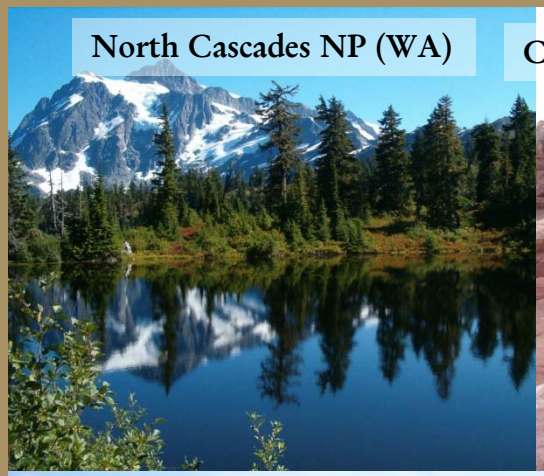
- NPS efforts are helping to complete the first–over mapping and helping to set foundation for update work (keep in mind - different land use and management issues; different clientele)

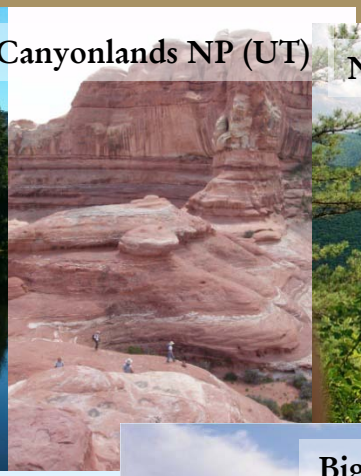
- NPS focus on soil carbon supports the need for refinement of soil carbon measurements and data review processes as well as new ways to use NRCS soils data...

- NPS has developed tools to check data completeness and correctness – specifically soil property data from interpretation generator (themes can represent limiting features and criteria in interps) directly to SDM data using custom SSURGO template

- NPS has been funding and requesting ESDs for years and has increased this funding which along with SSD funding has jump-started ESD efforts

Questions….


North Cascades NP (WA)

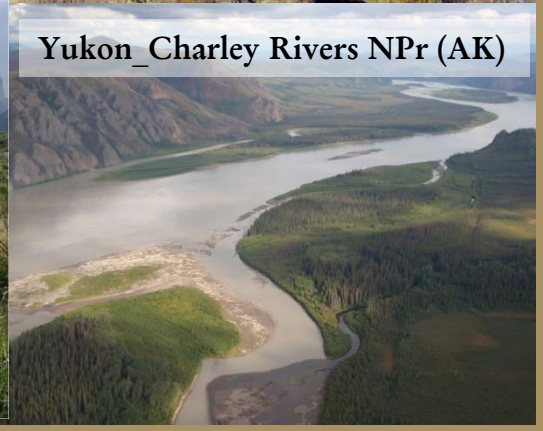

Canyonlands NP (UT)


New River Gorge NR (WV)


Glen Canyon NRA (AZ, UT)


Isle Royale NP (MI)


Big Bend NP (TX)


Yukon_Charley Rivers NPr (AK)

America's Cathedrals

EXPERIENCE YOUR AMERICA


Set the desired GPS accuracy with the slider, and click "Done" to return to the main view.
Carrier 7:03 PM
Save
SoilWeb for iPhone v 0.5
LAND, AIR AND WATER RESOURCES
NRCS Natural Resources Conservation Service
Component names are linked to their details on the CA Soil Resource page. Use the "back" arrow to return to the main view.
Carrier 6:12 PM
Soil Taxonomy
Order: Entisols
Suborder: Orthents [Map of Suborders]
Great group: Xerorthents
Subgroup: Typic Xerorthents
Family: Coarse-loamy, mixed, nonacid, Xerorthents
Soil Series: Pollasky (Link to OSD)
Phase: Pollasky-Montpellier complex, slopes
Data: [Lab Data]
Raw Data: Component All Horizons
Land Classification
Soil Suitability Ratings
Carrier 6:11 PM
Established Series
GLHURCH
05/2006
POLLASKY SERIES
The Pollasky series consists of moderately deep, well drained, moderately coarse textured Regosols formed in the residuum from softly to moderately consolidated arkosic sediments. They occur on undulating to steep dissected terraces under annual grasses and forbs. They have brown, slightly acid sandy loam A horizons and pale brown to yellowish brown, slightly acid to neutral, sandy loam C horizons abruptly overlying consolidated granitic sediments. Pollasky soils occur in the same
AT&T 2:50 PM
Carrier 6:03 PM
GPS
Pollasky
Montpellier
Carrier 6:03 PM
GPS
Pollasky
Montpellier
Click to start application
Application starts with GPS disabled. Click "GPS" to start acquiring location data. Click on the "info" button for application details.
Once a location with sufficient accuracy is acquired, map unit components are displayed. Soil profiles link to their Official Series Description