Opportunities for the Development and Display of Interpretations on Multiple Scales: *Gridded SSURGO and Beyond*

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2011 NCSS National Conference

NCSS Interpretations Forum

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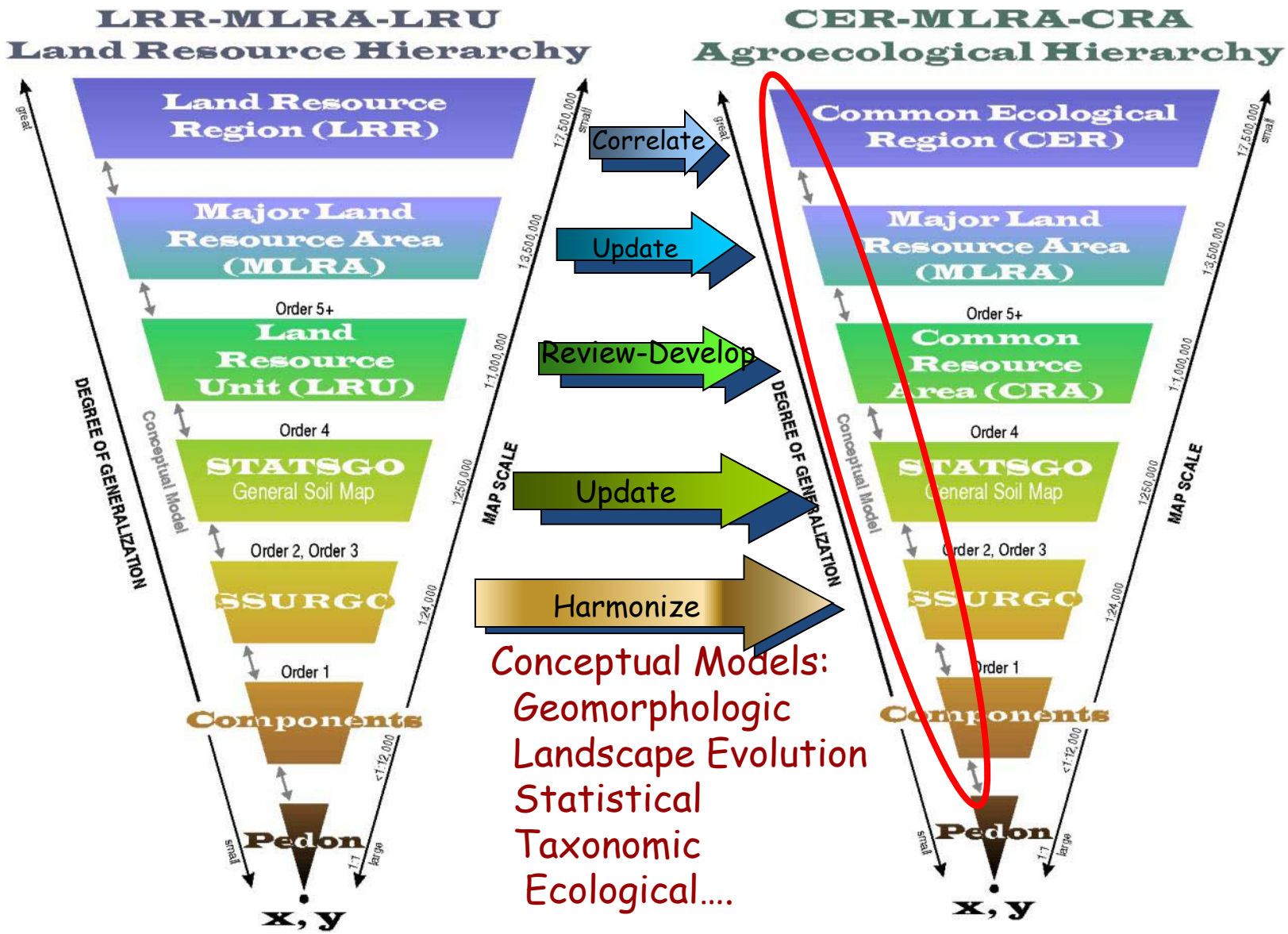
Soil Interpretations – *Current Condition*

- In another discipline, a “soil interpretation” may be considered a “model” (difference in language)
- Currently are “self contained” within the soil data model of NASIS (this can be a good thing or not…)
- Are non-geospatial in nature (do not consider geographic proximity to other map features
- All map features (polygons) for a given map unit are treated the same
- Do not use temporal information beyond Soil Taxonomy Soil Climate Regime (longer term climate summary class)

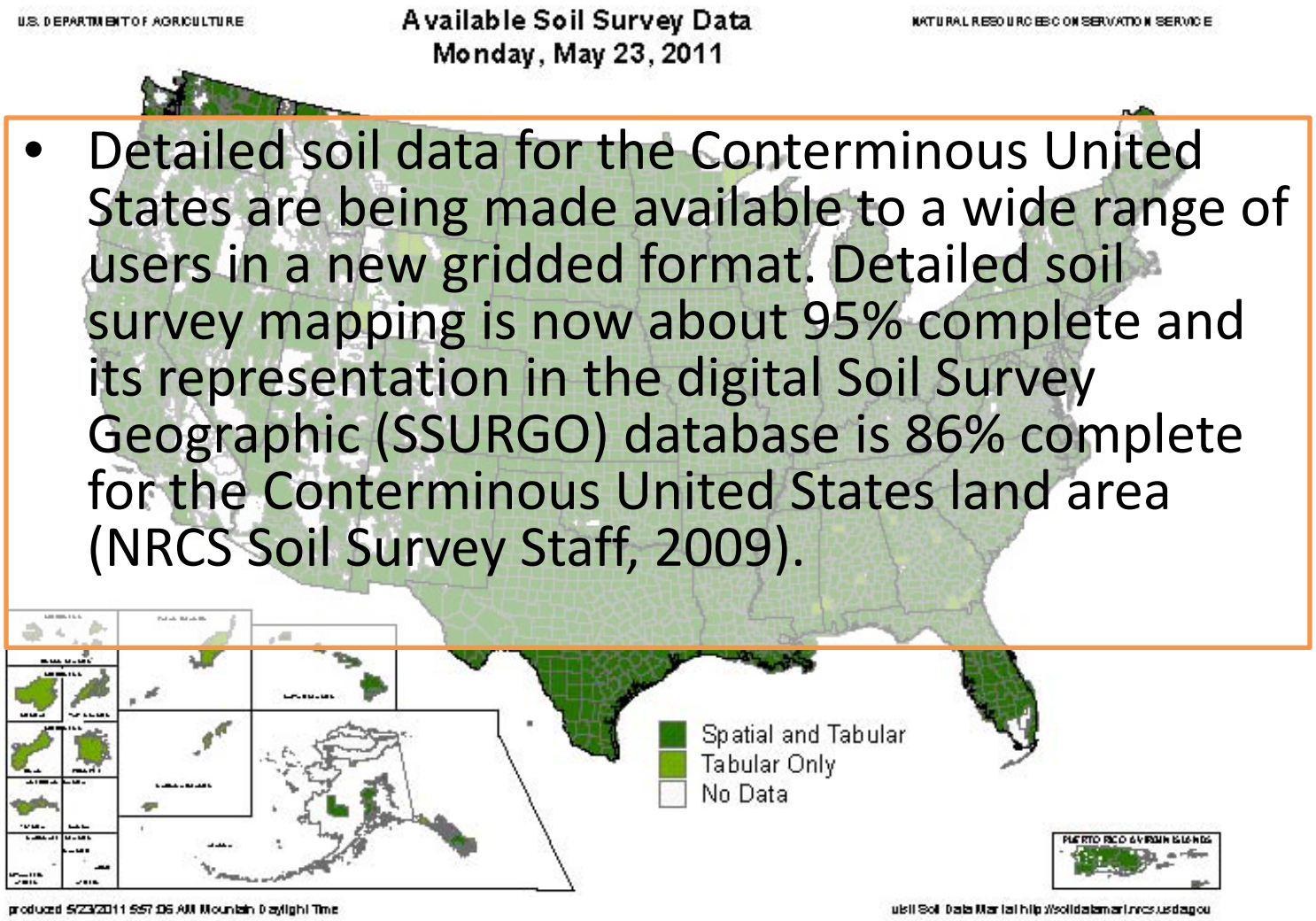
Soil Interpretations – *Future Condition Opportunities…*

- Soil interpretation become more “model-like”
- Incorporate more external data sources (e.g. climate, terrain, hydrology, etc.)
- Are more geospatial in nature (consider geographic proximity to other map features)
- Map features (polygons) for a given map unit are treated differently depending more local condition (e.g. based on feature composition…)
- Use consistent period of record and higher temporal resolution climate information that predicts wet year/dry year soil performance, rather than the average year

Scaleable Soil Geographic Data 1993-2011



Conceptual Models:
- Geomorphologic
- Landscape Evolution
- Statistical
- Taxonomic
- Ecological….



- Detailed soil data for the Conterminous United States are being made available to a wide range of users in a new gridded format. Detailed soil survey mapping is now about 95% complete and its representation in the digital Soil Survey Geographic (SSURGO) database is 86% complete for the Conterminous United States land area (NRCS Soil Survey Staff, 2009).

Source: Bliss, Norman B., Sharon W. Waltman, and Anne C. Neale (2010), Detailed soil information for hydrologic modeling in the Conterminous United States, Abstract H43B-1227 presented at 2010 Fall Meeting, American Geophysical Union, San Francisco, Calif. 13-17 Dec.

USGS science for a changing world

NRCS Natural Resources Conservation Service

Detailed Soil Information for Hydrologic Modeling in the Conterminous United States

H43B-1227

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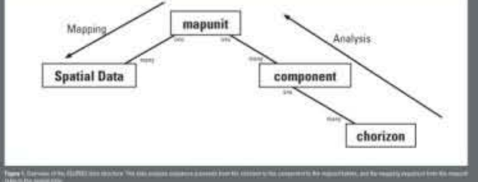
Introduction

Detailed soil data for the Conterminous United States are being made available to a wide range of users in a new gridded format. Detailed soil survey mapping is now about 95% complete and its representation in the digital Soil Survey Geographic (SSURGO) database is 86% complete for the Conterminous United States land area (NRCS Soil Survey Staff, 2009). The soil properties of interest to one specific group of users, hydrologic modelers, include available water capacity, bulk density, saturated hydraulic conductivity, field capacity, porosity, average soil thickness, soil organic matter or carbon content, and percentages of sand, silt, clay, and rocks. The methods for creating the gridded format data summarize the attributes across soil horizons and soil components to create a value for each attribute at the map unit level. Separate [illegible] developed for specific depth zones as required. The SSURGO data are being continuously improved by the National Cooperative Soil Survey (NCSS) under the leadership of the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS). Readily accessible gridded [illegible] several advantages over vector data, such as easier integration with other [illegible]. Currently, these data are being made available at a 30-meter resolution in the Albers Equal Area projection. The compilation of the new database has been made possible [illegible] of Sustainable Ecosystem Services being developed under the leadership [illegible] Protection Agency (EPA), along with many partner organizations including the NRCS and the U.S. Geological Survey. When complete, the Atlas information will include ma[illegible] will be used in a wide variety of ecosystem service assessments. The Atlas [illegible] created through this effort to help estimate ecosystem services related to climate regulation, food and fiber, water quality and quantity, habitat, and protection from flood events.

Methods

The soil attributes for each map unit were calculated following the methods of Bliss (2003) and Bliss et al. (1995). The primary data source was the SSURGO database (NRCS Soil Survey Staff, 2009), using a snapshot of SSURGO data as of December, 2009. The SSURGO database has a relational database structure, so estimates of attributes were calculated by horizon, component, and map unit, as shown in figure 1. The estimates for each map unit were computed as mass measures in g m^{-2} or volume measures as m m^{-1} or as the percentage of component area having a specific class of soil properties. We began with a 10-meter gridded version of SSURGO from NRCS and resampled to a 30-meter cell size for analysis and a 1,200-meter cell size for national display. Where SSURGO data were not available, the results were substituted from a similar analysis using the General Soil Map (STATSGO2) of the United States, a successor to the State Soil Geographic (STATSGO) Database (NRCS Soil Survey Staff, 1992; 1994).

The basic SSURGO and STATSGO2 data attribute structure is given in figure 1. The analysis of soil attributes starts on the component horizon (*chorizon*) table, aggregates the quantitative measures over the appropriate layers for a given analysis, and stores the result at the level of the component table (*component*). A weighted average of the component values is computed using the representative component percentage (comppct_r) as the area weighting factor, and the results are stored at the level of the map unit (*mapunit table*). These results are then copied to the spatial datasets where they are used to display maps.

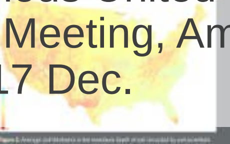


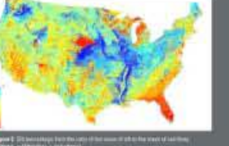
Ideally, the component percentage would add to 100 percent for each map unit; however, this currently occurs for only 54 percent of the map units. If the sum of the component percentages was not 100 percent, then the results were scaled to 100 percent. If no data were present for SSURGO, information was substituted from STATSGO2.

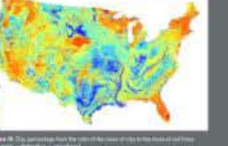
Additional soil attribute datasets (not shown) have been computed by depth zone. Depth zones (in centimeters) can be defined by users, and we have chosen 0–5, 5–20, 20–50, 50–100, 100–150, and greater than 150 cm, plus three additional zones at 0–30, 0–100, and 0–150 cm. The results presented here are for the total profile (all horizons present in the database) unless otherwise noted.

Results and Discussion

The soil attributes useful for modeling water in soils may be considered in four categories: 1) volume of water, 2) bulk density, 3) mass of soil particles, and 4) rates of water movement. The volume of water is useful for parameterizing water storage terms in hydrologic models, and examples of relevant soil variables would be available water capacity, average soil thickness, field capacity, and porosity. [illegible] mass basis and is required for analyses that include soil mass [illegible] given in the soil dataset [illegible] (derived from soil organic matter) and percentages of sand, silt, clay, and rocks. The organic matter holds water in greater proportion to its mass than the mineral soil particles. The percentages of sand, silt, clay, and rocks are used by some models to estimate water capacities, but if this is the purpose, we recommend using the available water capacity, which can more precisely summarize this information. The hydrologic group variable is an ordinal ranking of relative infiltration rates where code "A" represents fast infiltration and code "D" represents slow [illegible] and "C/D") where the infiltration will be slow (i.e., code "D") if the soil is not artificially drained, and higher [illegible] give information on whether or not a soil has been drained. A separate map is generated for each case showing the percentage of land area (percentage of components) with that case, and only case "B" is shown here. The saturated hydrologic conductivity is a measure of the movement of water through a soil (e.g., μm s^{-1}). As a rate variable, this cannot properly be averaged across soil horizons, so the map shown here is not recommended for direct use in models. A better approach would be to use the conductivity measure [illegible] types of maps that can be generated from the SSURGO data, with gaps filled from the STATSGO2. [illegible] the "representative value").







Conclusions

Many hydrologic models use soil information to represent the capacity of soils to hold water and the rates of infiltration and flow of water through soil. The national Soil Survey Geographic (SSURGO) Database provides an excellent source for this type of information, but it is a complex database designed to capture as much information as possible. Its native vector format requires pre-processing to match the needs of distributed hydrologic modeling which generally uses raster grid cells. The examples shown here were designed to [illegible] from the original datasets while making the [illegible] modelers.

We consider the results from SSURGO (compiled at 1:12,000 and 1:24,000 map [illegible] than those from the STATSGO2 (compiled [illegible] NRCS and cooperating agencies have invested considerable resources in upgrading the quality of the soil databases in [illegible] reflected in the SSURGO data. Most of [illegible] data are on Federal lands in the Rocky Mountains and Alaska.

[illegible] attributes, of which perhaps 300 will be useful for [illegible] and 50 will be useful for hydrologic modeling. The SSURGO processing for the National Atlas of Sustainable Ecosystem Services is designed to create raster versions of soil attributes by depth zones that are easy to use, and to save modelers the effort of having to spatially mosaic information from many soil survey areas and to learn a complex hierarchical relational database structure for attribute information. We welcome interchange with modelers on the formats and data attributes that will meet their needs.

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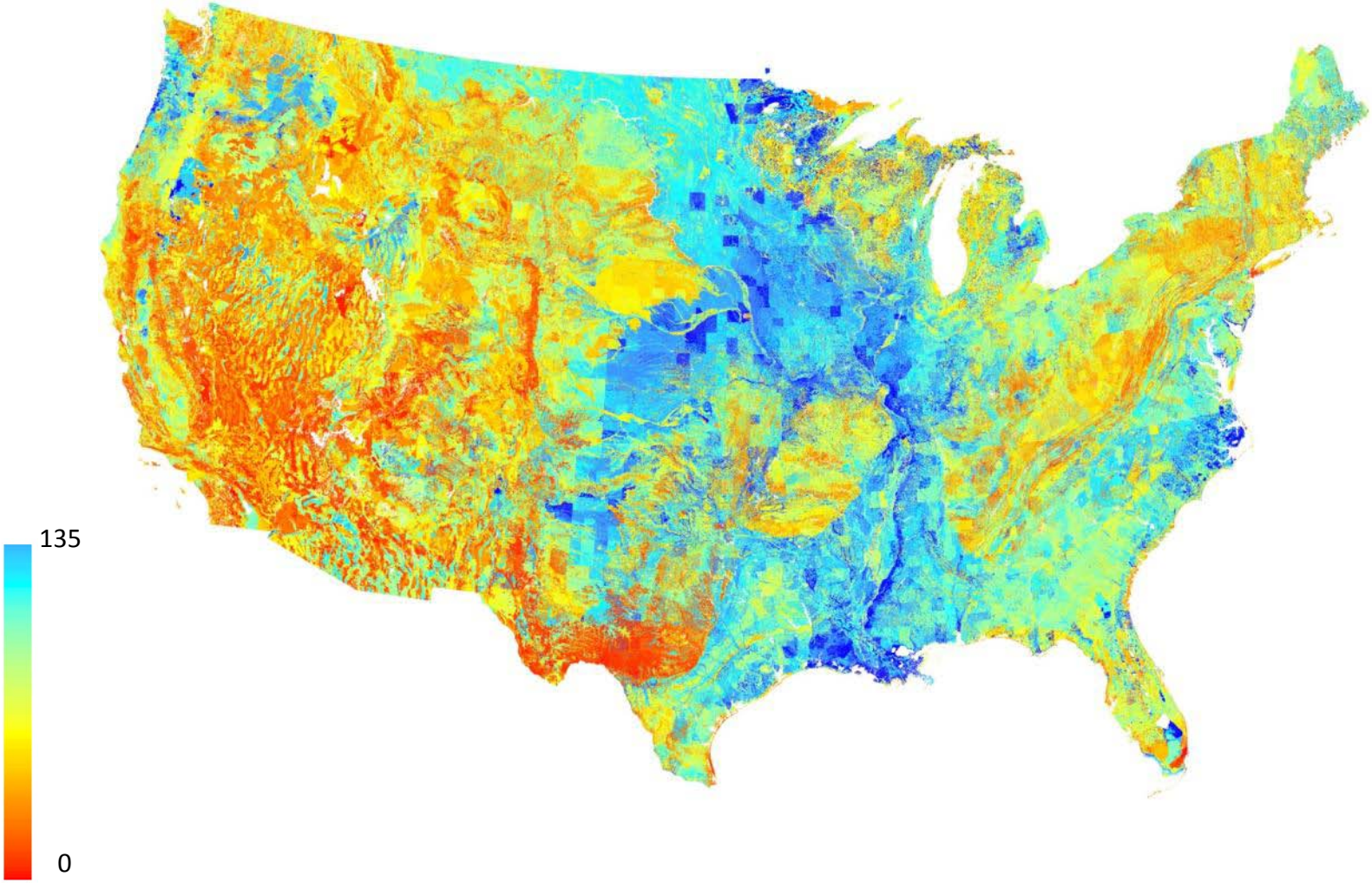
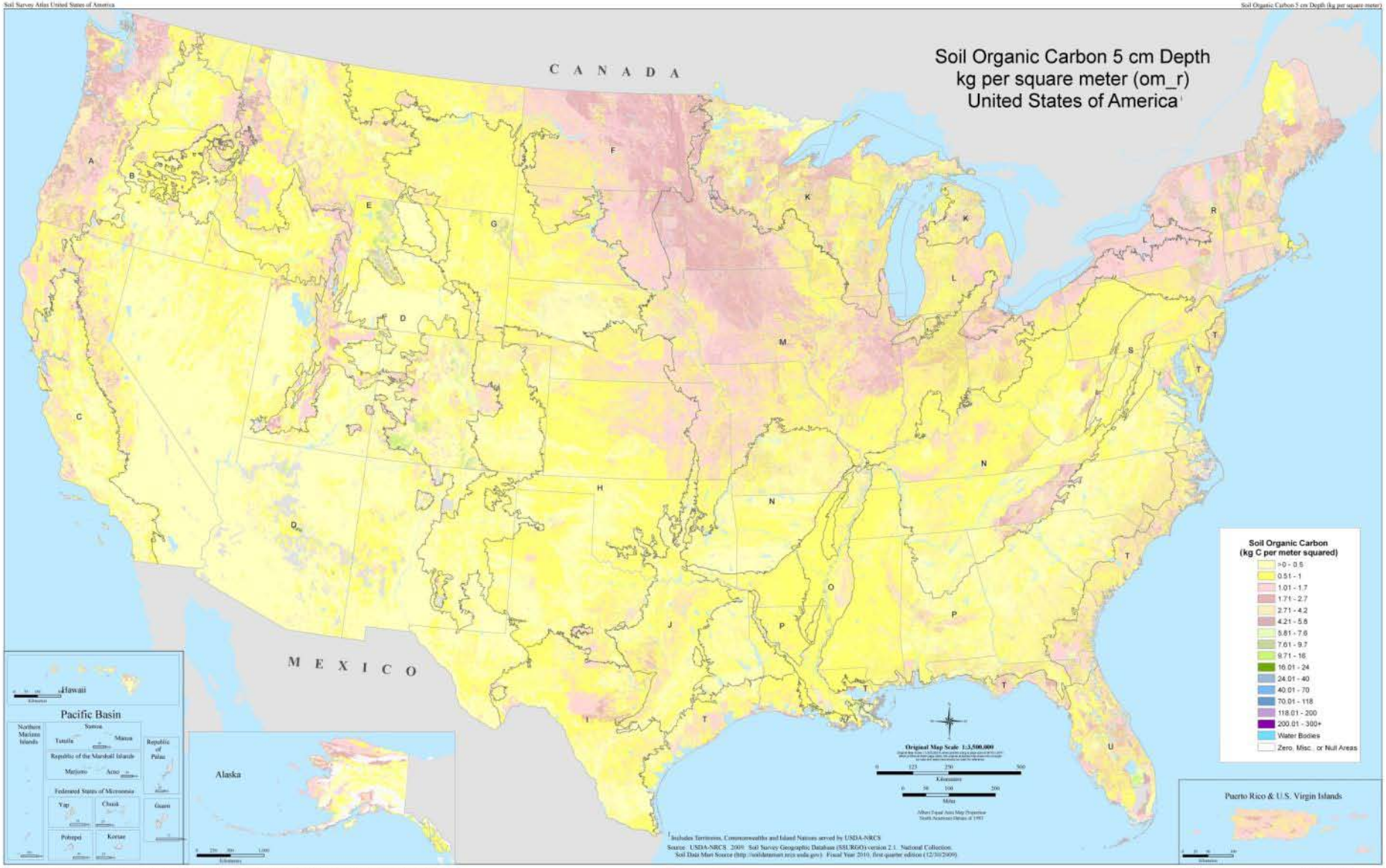
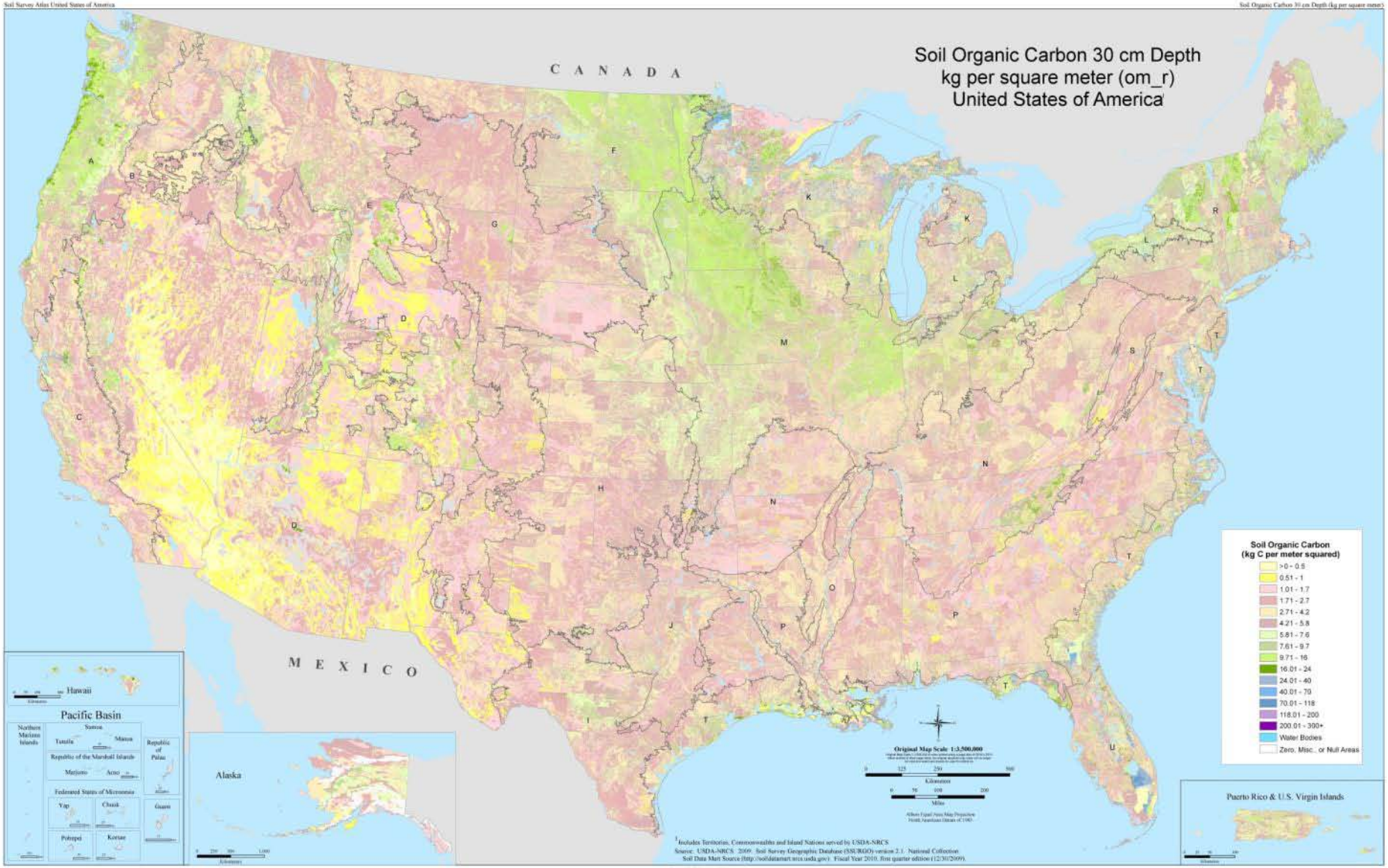
Acknowledgments

This work was supported by the U.S. EPA Landscape Ecology Program, the USGS Climate Effects Network, and by the USDA/NRCS Soil Survey Program, and uses data collected by the National Cooperative Soil Survey.

Figure 5. Available water capacity is a measure of how much water the soil can hold and make available to plants. Intuitively, it is the difference between the moisture content at field capacity and the moisture content at the permanent wilting point, which are represented in laboratory measurements as the water contents at 33 kPa and 1,500 kPa, respectively. The measure is a dimensionless ratio of the volume of water divided by the volume of soil, where the volumes are often represented as a thickness on a per-square-meter basis (e.g., cm of water per cm of soil). [Uses SSURGO variable awc_r.]

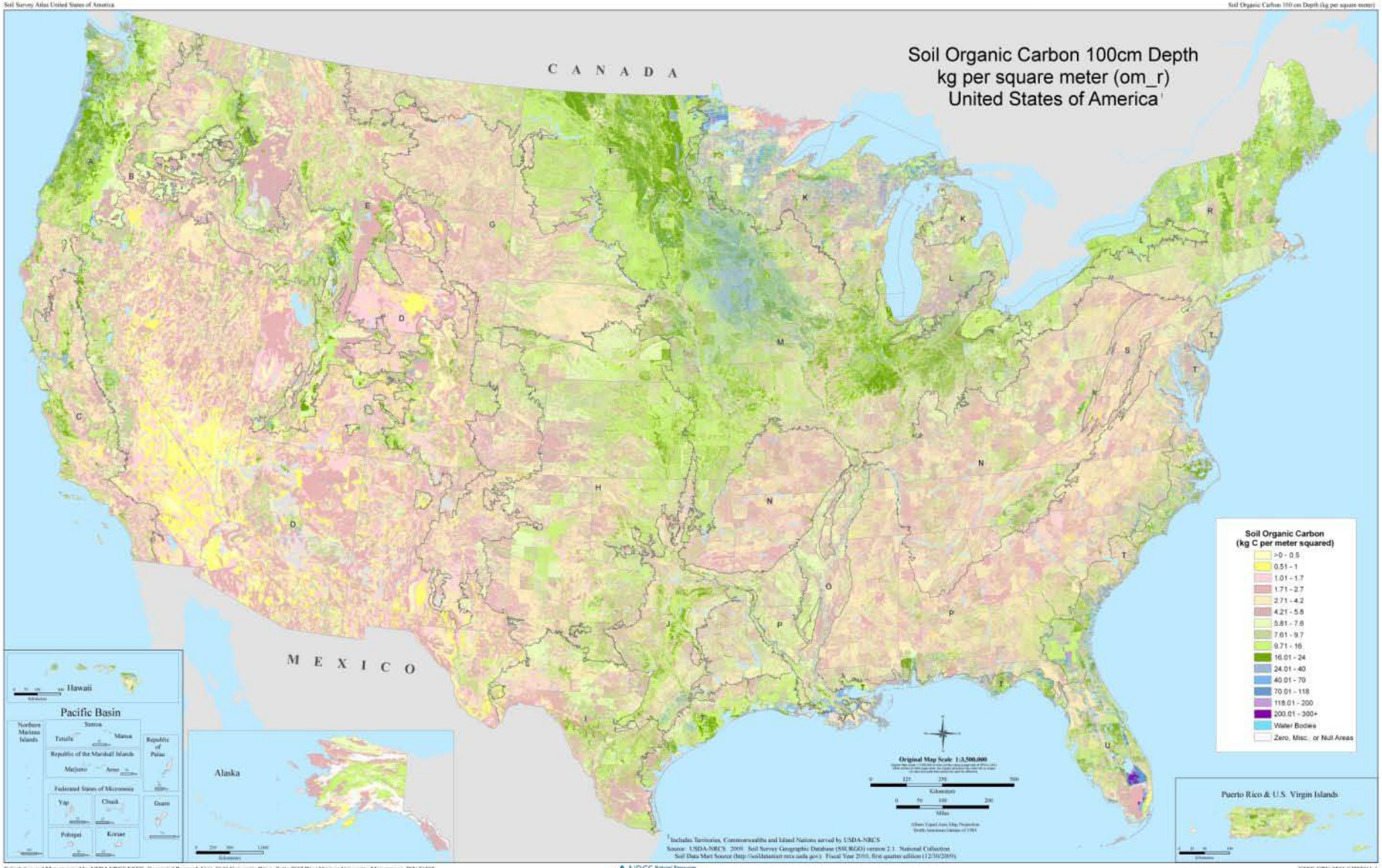



Soil Organic Carbon 5 cm Depth
kg per square meter (om_r)
United States of America
CANADA
MEXICO
Soil Organic Carbon
(kg C per meter squared)
>0 - 0.5
0.51 - 1
1.01 - 1.7
1.71 - 2.7
2.71 - 4.2
4.21 - 5.8
5.81 - 7.6
7.61 - 9.7
9.71 - 16
16.01 - 24
24.01 - 40
40.01 - 70
70.01 - 118
118.01 - 200
200.01 - 300+
Water Bodies
Zero, Misc. or Null Areas
Hawaii
Pacific Basin
Northern Mariana Islands
Samoa
Tutuila
Manua
Republic of Palau
Republic of the Marshall Islands
Majuro
Atoll
Federated States of Micronesia
Yap
Chuuk
Guam
Pohnpei
Kosrae
Alaska
Puerto Rico & U.S. Virgin Islands
Original Map Scale 1:3,500,000
Kilometers
Miles
Albers Equal Area Map Projection
North American Datum of 1983
Includes Territories, Commonwealths and Island Nations served by USDA-NRCS
Source: USDA-NRCS. 2009. Soil Survey Geographic Database (SSURGO)-version 2.1. National Collection.
Soil Data Mart Source (http://soildatamart.nrcs.usda.gov). Fiscal Year 2010, first quarter edition (12/30/2009).

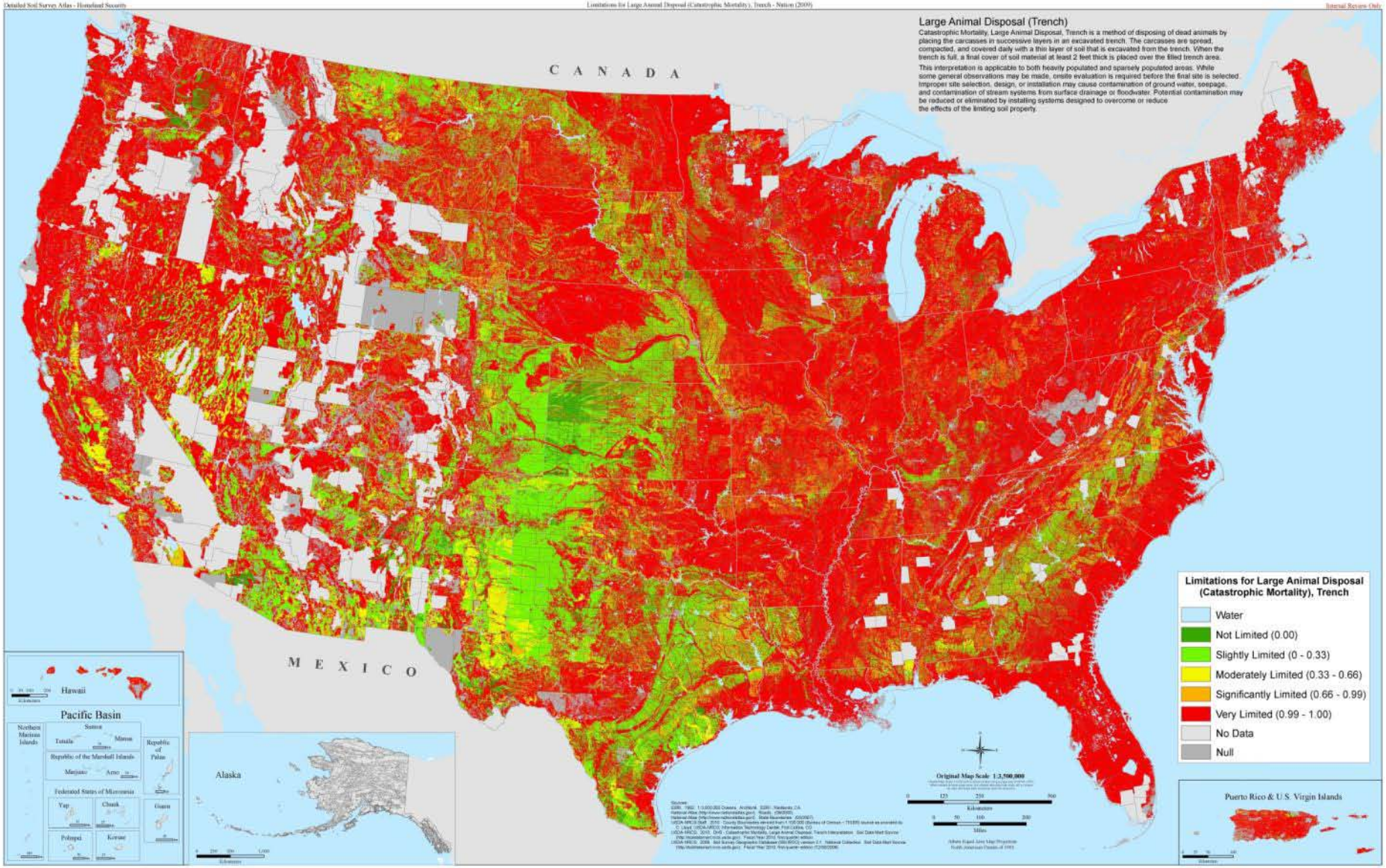


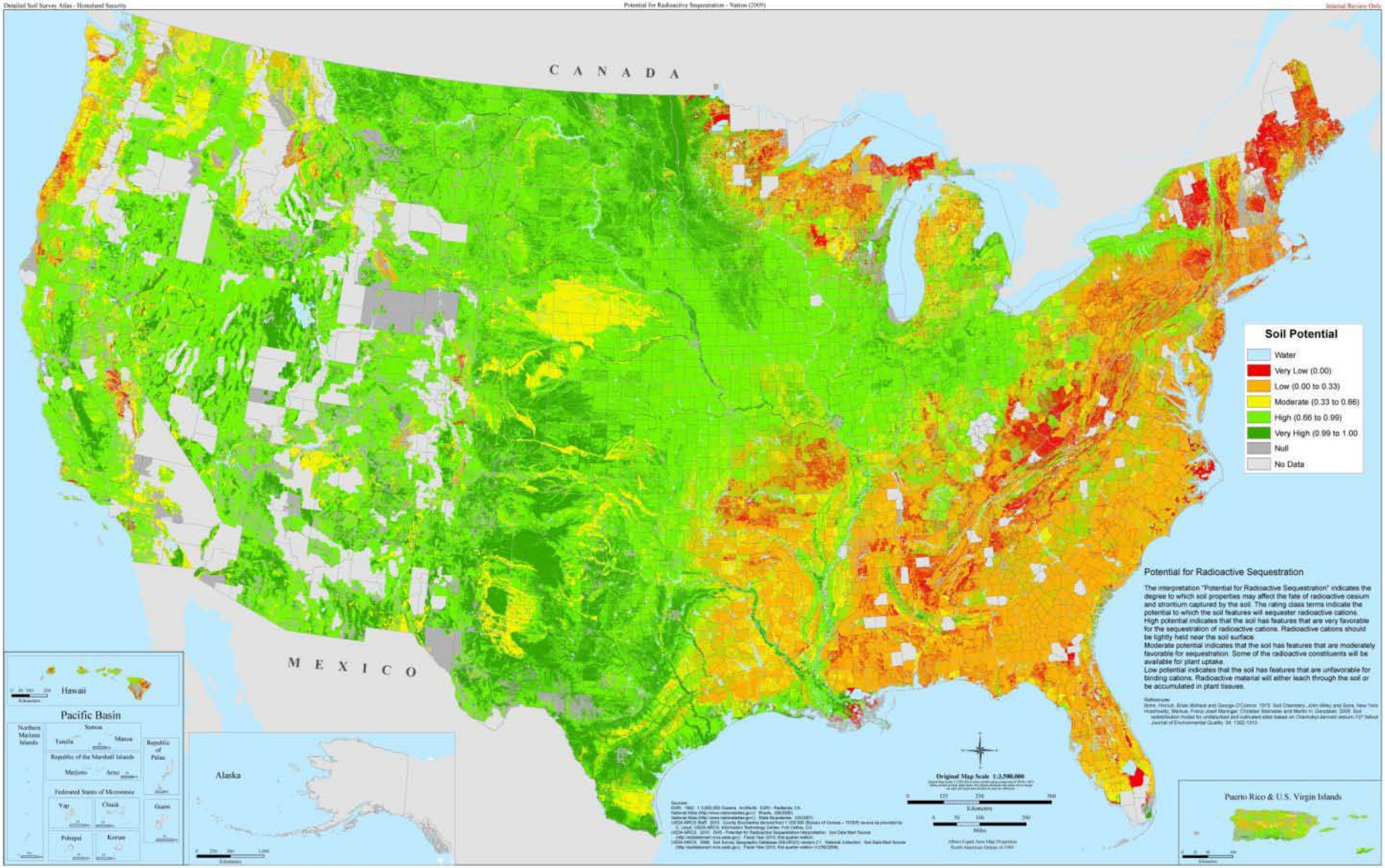
[1] Includes Territories, Commonwealths and Island Nations served by USDA-NRCS

Source: USDA-NRCS 2009. Soil Survey Geographic Database (SSURGO) version 2.1. National Collection Soil Data Mart Source (http://soildatamart.nrcs.usda.gov). Fiscal Year 2010, first quarter edition (12/30/2009).



[1] Includes Territories, Commonwealths and Island Nations served by USDA-NRCS
Source: USDA-NRCS. 2009. Soil Survey Geographic Database (SSURGO) version 2.1. National Collection
Soil Data Mart Source (http://soildatamart.nrcs.usda.gov). Fiscal Year 2010, first quarter edition (12/30/2009).


Large Animal Disposal (Trench)
Catastrophic Mortality, Large Animal Disposal, Trench is a method of disposing of dead animals by placing the carcasses in successive layers in an excavated trench. The carcasses are spread, compacted, and covered daily with a thin layer of soil that is excavated from the trench. When the trench is full, a final cover of soil material at least 2 feet thick is placed over the filled trench area.
This interpretation is applicable to both heavily populated and sparsely populated areas. While some general observations may be made, onsite evaluation is required before the final site is selected. Improper site selection, design, or installation may cause contamination of ground water, seepage, and contamination of stream systems from surface drainage or floodwater. Potential contamination may be reduced or eliminated by installing systems designed to overcome or reduce the effects of the limiting soil property.
CANADA
MEXICO
Limitations for Large Animal Disposal (Catastrophic Mortality), Trench
Water
Not Limited (0.00)
Slightly Limited (0 - 0.33)
Moderately Limited (0.33 - 0.66)
Significantly Limited (0.66 - 0.99)
Very Limited (0.99 - 1.00)
No Data
Null
Hawaii
Pacific Basin
Northern Mariana Islands
Samoa
Tutuila
Manua
Republic of the Marshall Islands
Majuro
Ailuk
Federated States of Micronesia
Yap
Chuuk
Pohnpei
Kosrae
Republic of Palau
Guam
Alaska
Puerto Rico & U.S. Virgin Islands
Original Map Scale 1:3,500,000
Kilometers
Miles



Potential for Radioactive Sequestration

The interpretation "Potential for Radioactive Sequestration" indicates the degree to which soil properties may affect the fate of radioactive cesium and strontium captured by the soil. The rating class terms indicate the potential to which the soil features will sequester radioactive cations.
High potential indicates that the soil has features that are very favorable for the sequestration of radioactive cations. Radioactive cations should be lightly held near the soil surface.
Moderate potential indicates that the soil has features that are moderately favorable for sequestration. Some of the radioactive constituents will be available for plant uptake.
Low potential indicates that the soil has features that are unfavorable for binding cations. Radioactive material will either leach through the soil or be accumulated in plant tissues.

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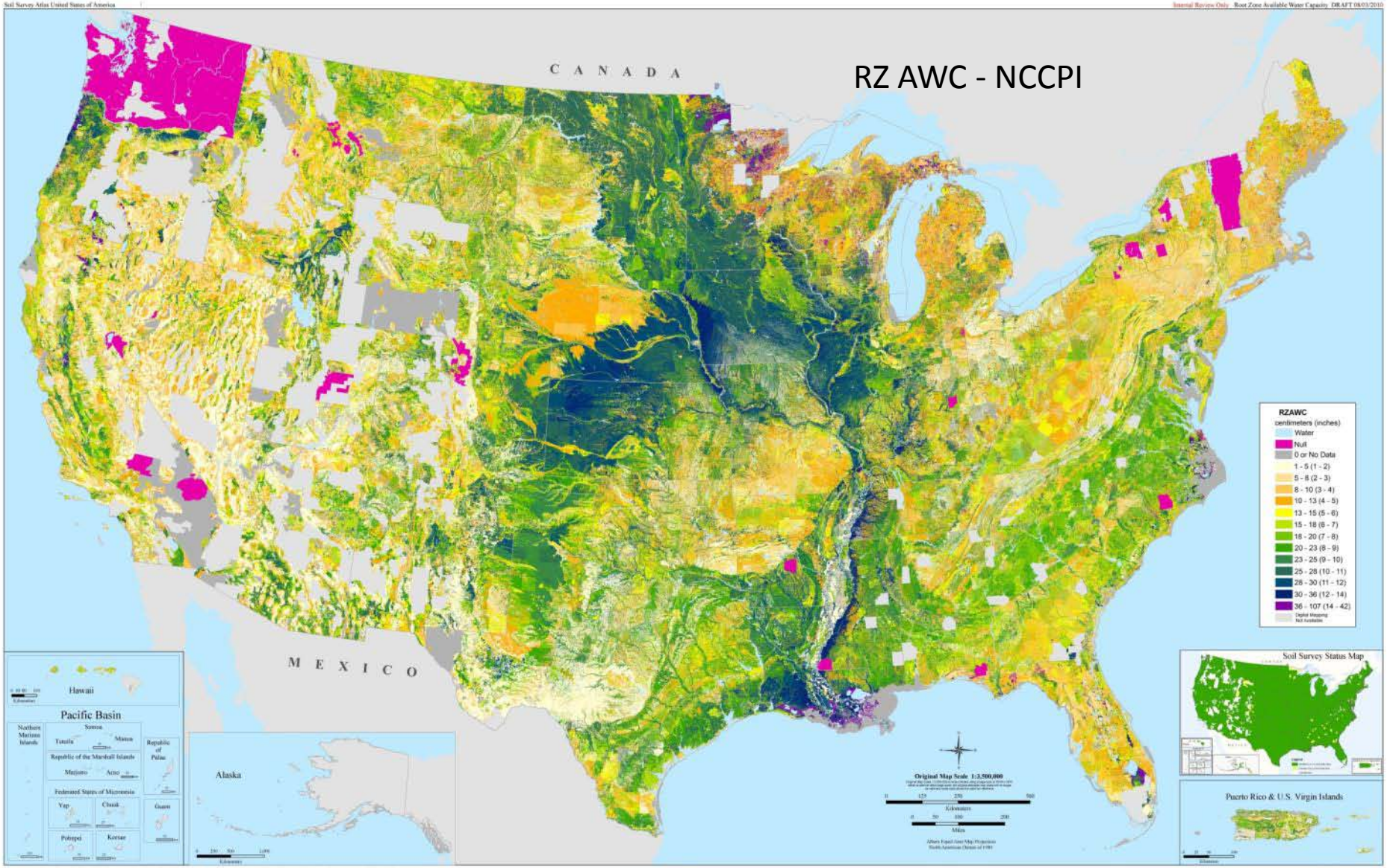
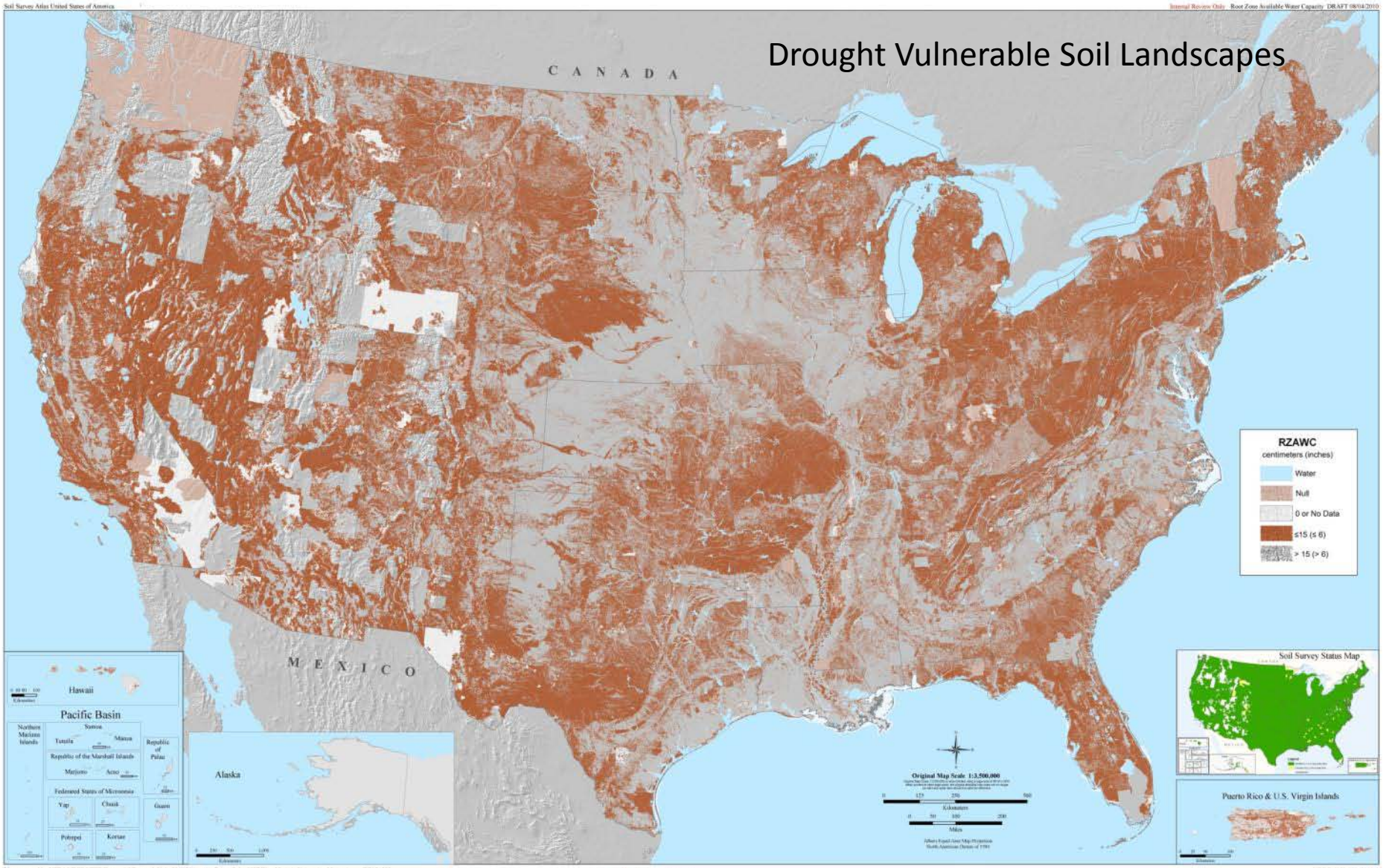
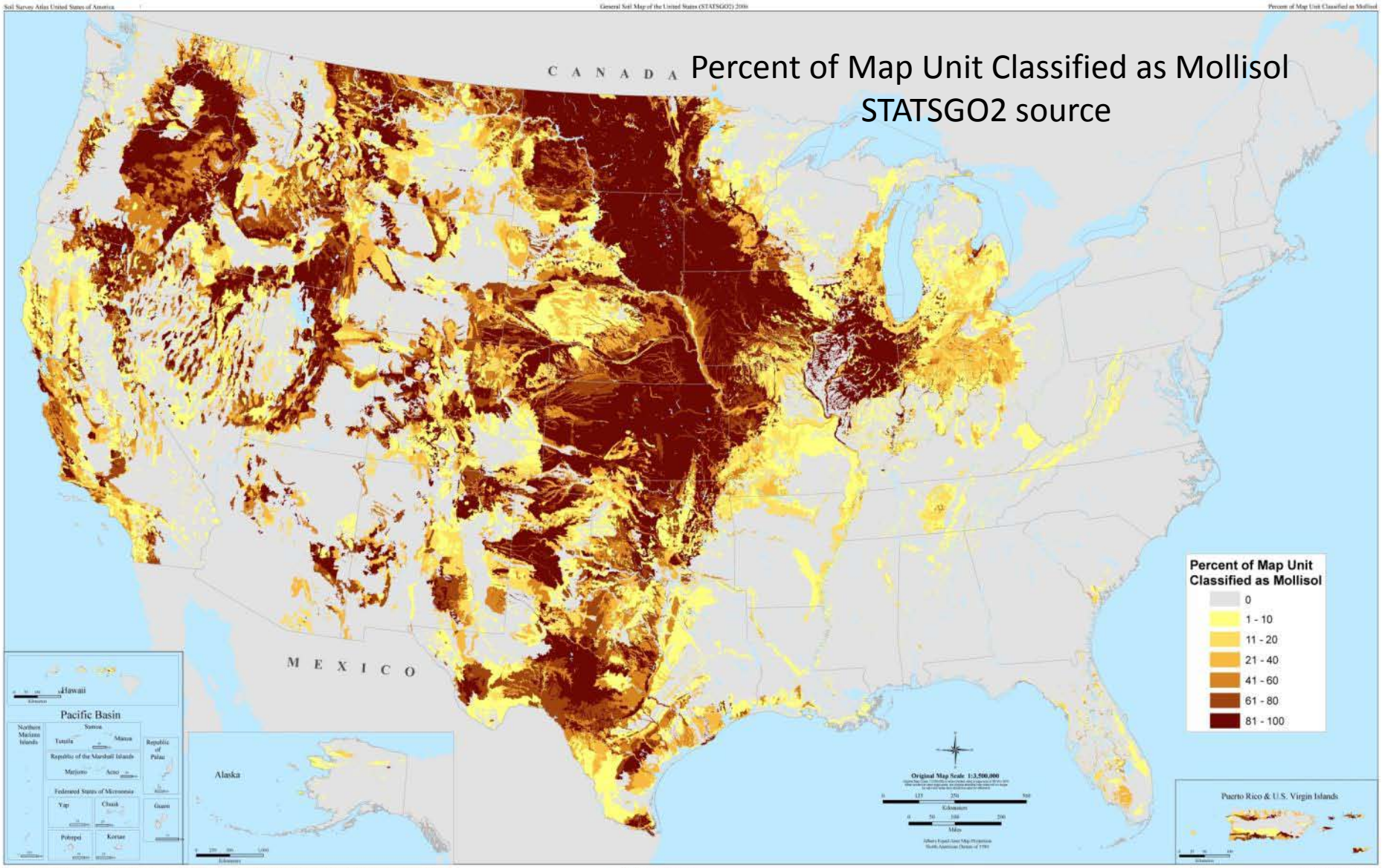
Calculation and Map prepared by USDA NRCS NSSC - Geospatial Research Unit, 3040 University Drive, Suite 3037 West Virginia University, Morgantown, WV 26505
NRCS Natural Resources Conservation Service
NSSC-GRU-9833-05042011-1

RZ AWC - NCCPI


CANADA
MEXICO
RZAWC
centimeters (inches)
Water
Null
0 or No Data
1 - 5 (1 - 2)
5 - 8 (2 - 3)
8 - 10 (3 - 4)
10 - 13 (4 - 5)
13 - 15 (5 - 6)
15 - 18 (6 - 7)
18 - 20 (7 - 8)
20 - 23 (8 - 9)
23 - 25 (9 - 10)
25 - 28 (10 - 11)
28 - 30 (11 - 12)
30 - 36 (12 - 14)
36 - 107 (14 - 42)
Digital Mapping Not Available
Hawaii
Pacific Basin
Alaska
Soil Survey Status Map
Puerto Rico & U.S. Virgin Islands
Original Map Scale 1:3,500,000

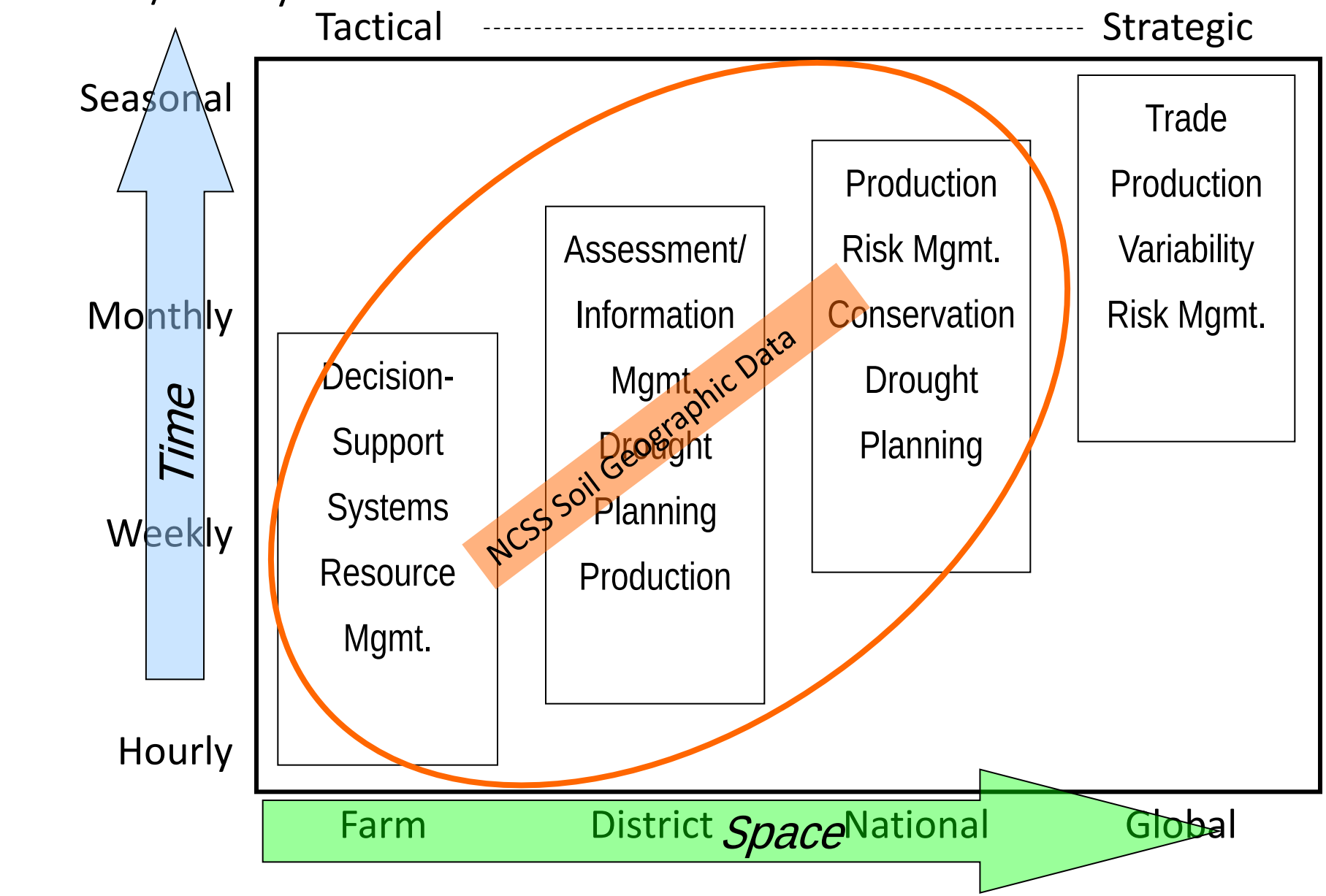
Drought Vulnerable Soil Landscapes



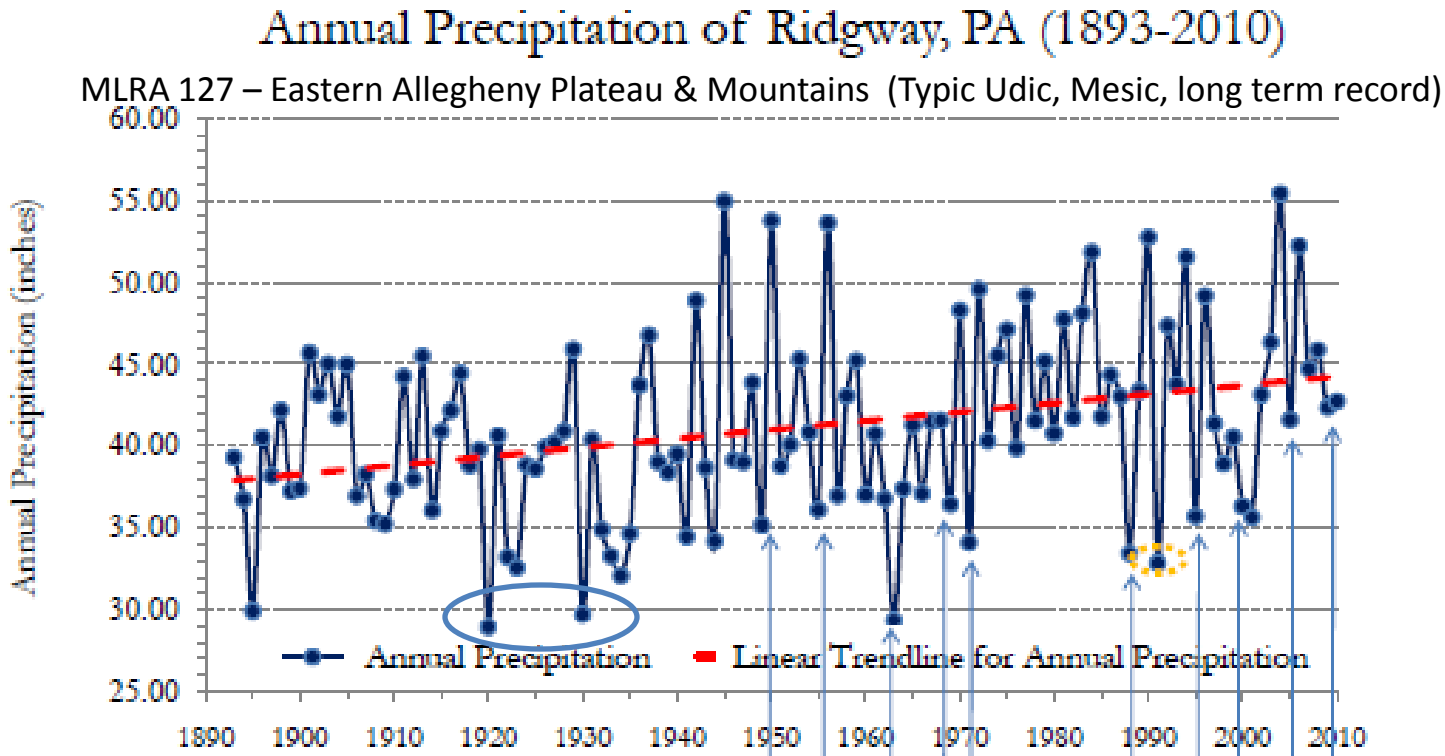

Soil Survey Atlas United States of America
General Soil Map of the United States (STATSGO2) 2006
Percent of Map Unit Classified as Mollisol
Percent of Map Unit Classified as Mollisol
STATSGO2 source
CANADA
MEXICO
Percent of Map Unit Classified as Mollisol
0
1 - 10
11 - 20
21 - 40
41 - 60
61 - 80
81 - 100
Hawaii
Pacific Basin
Alaska
Puerto Rico & U.S. Virgin Islands
Original Map Scale 1:3,500,000
Calculation and Map prepared by USDA NRCS NSSC -Geospatial Research Unit, 3040 University Drive, Suite 3037 West Virginia University, Morgantown, WV 26505
NRCS Natural Resources Conservation Service
NSSC-GRU-9833-110820110-2

UN World Meteorology Organization October 2000
Report of Three Working Groups: Software for Agroclimatic Data Managment

Agroclimatic Decision Making

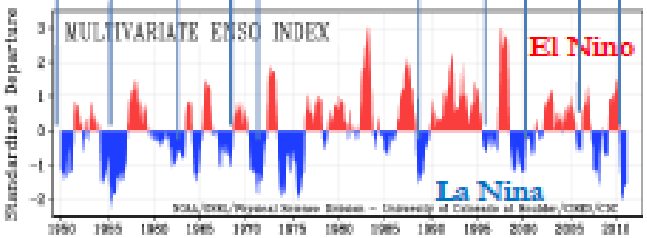


Soil climate simulation models allow the study of soils in the 4th dimension – *Time*.....



- MAP increasing through time
- Drought years associated with La Nina episodes; weak ENSO signature
- La Nina episodes receive 1.71 inches less on a calendar year basis over the past 60 years
- Note the "Dust Bowl" episodes
- Long-term mean = 41.06 in

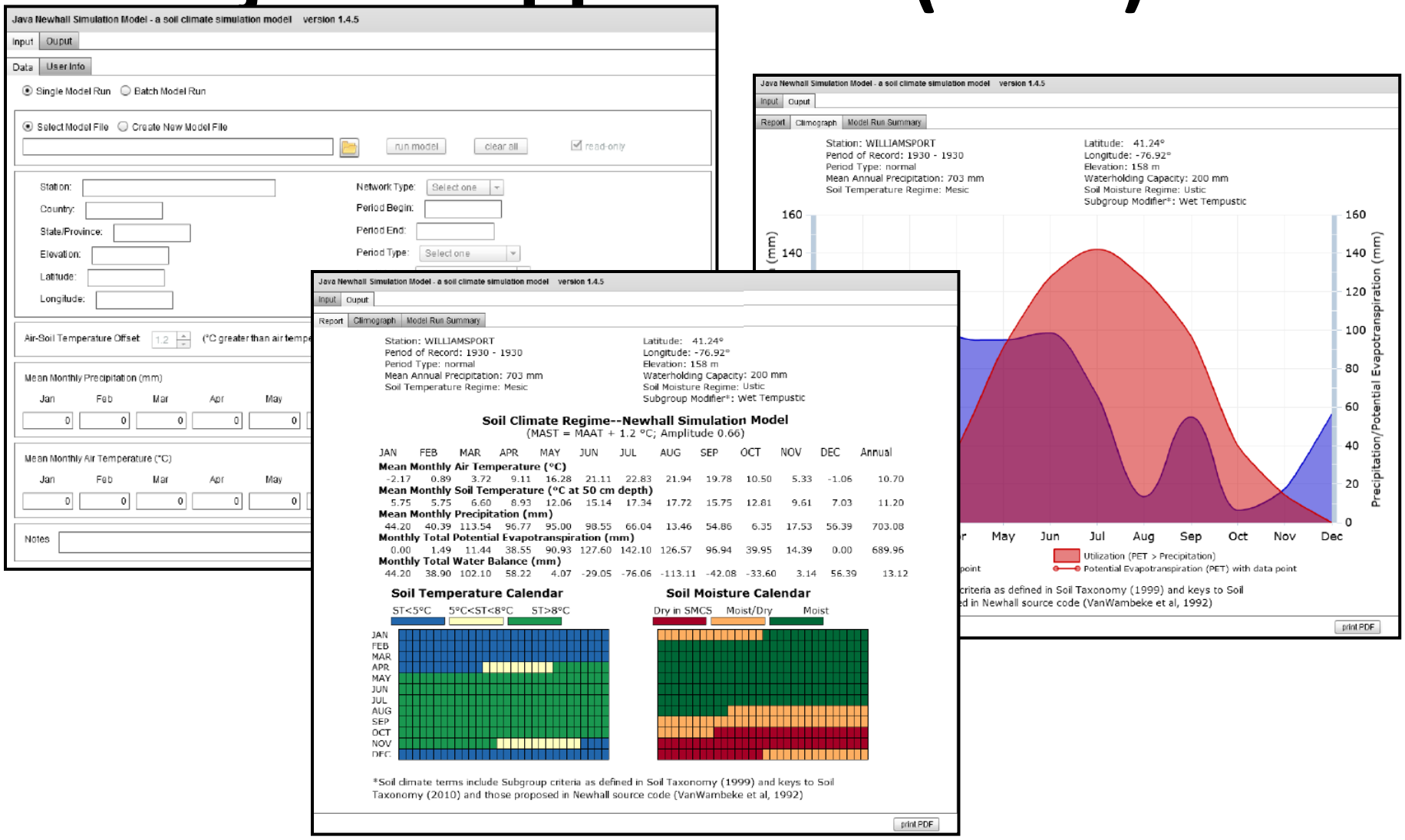
Normals	PPT
1901-1930	39.44
1911-1940	38.73
1921-1950	39.51
1931-1960	40.72
1941-1970	40.99
1951-1980	41.35
1961-1990	42.39
1971-2000	43.29
1981-2010	43.85



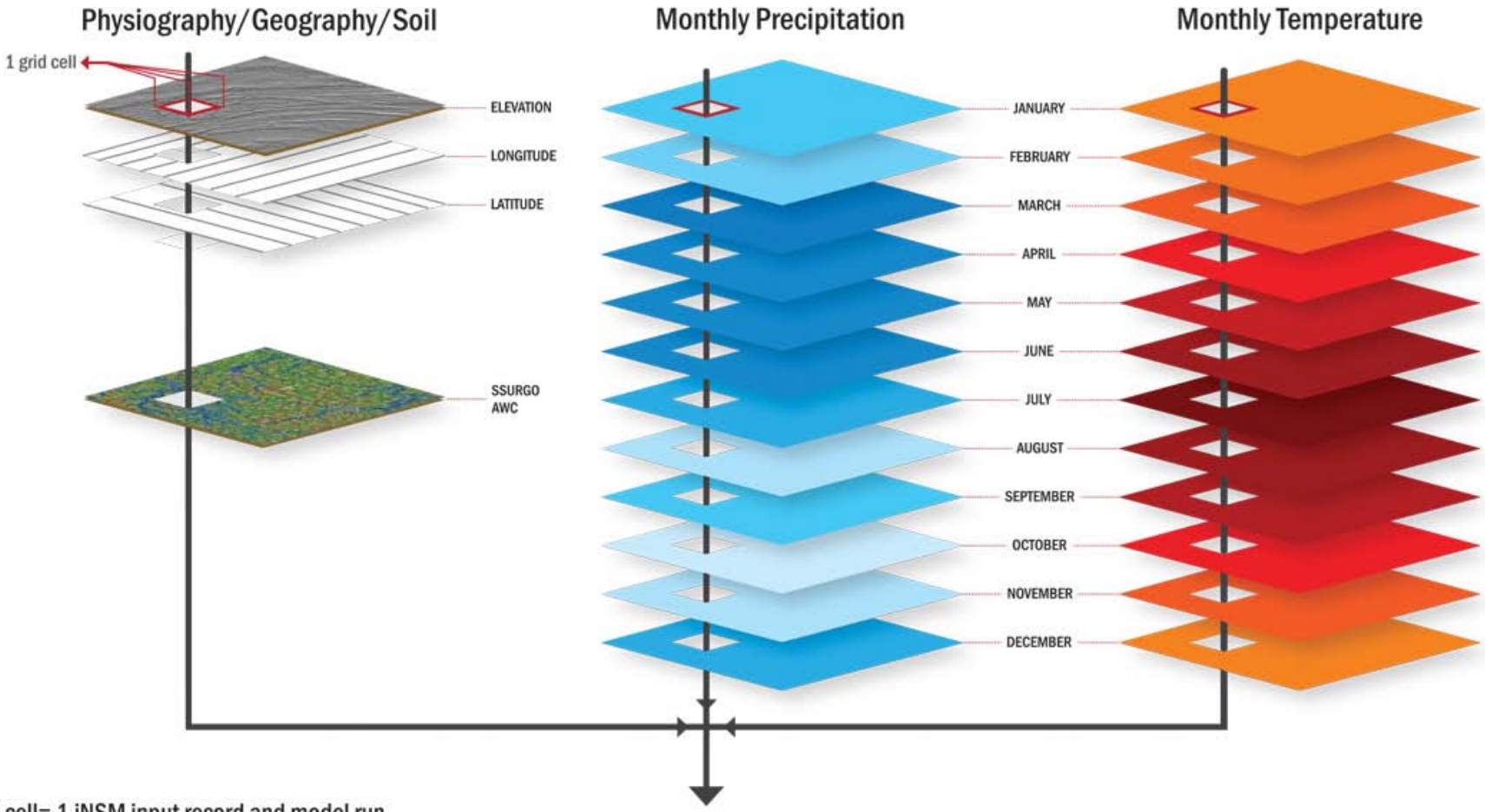
ENSO or El Nino Southern Oscillation

Growing wetter (more fungal disease, increase in Late Blight, etc.

jNSM Application (2011)



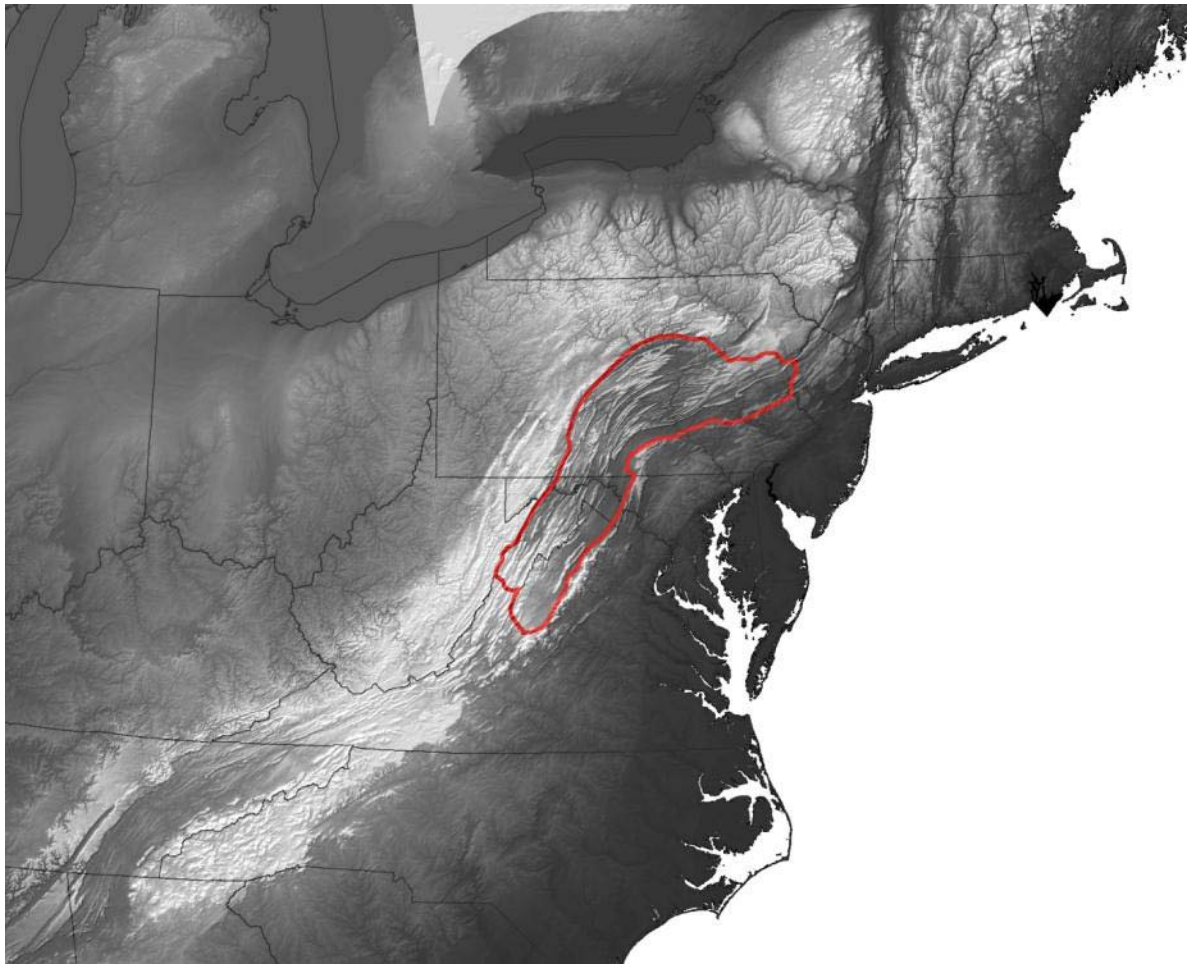
jNSM inputs gathered through geospatial overlay of (28) map layers



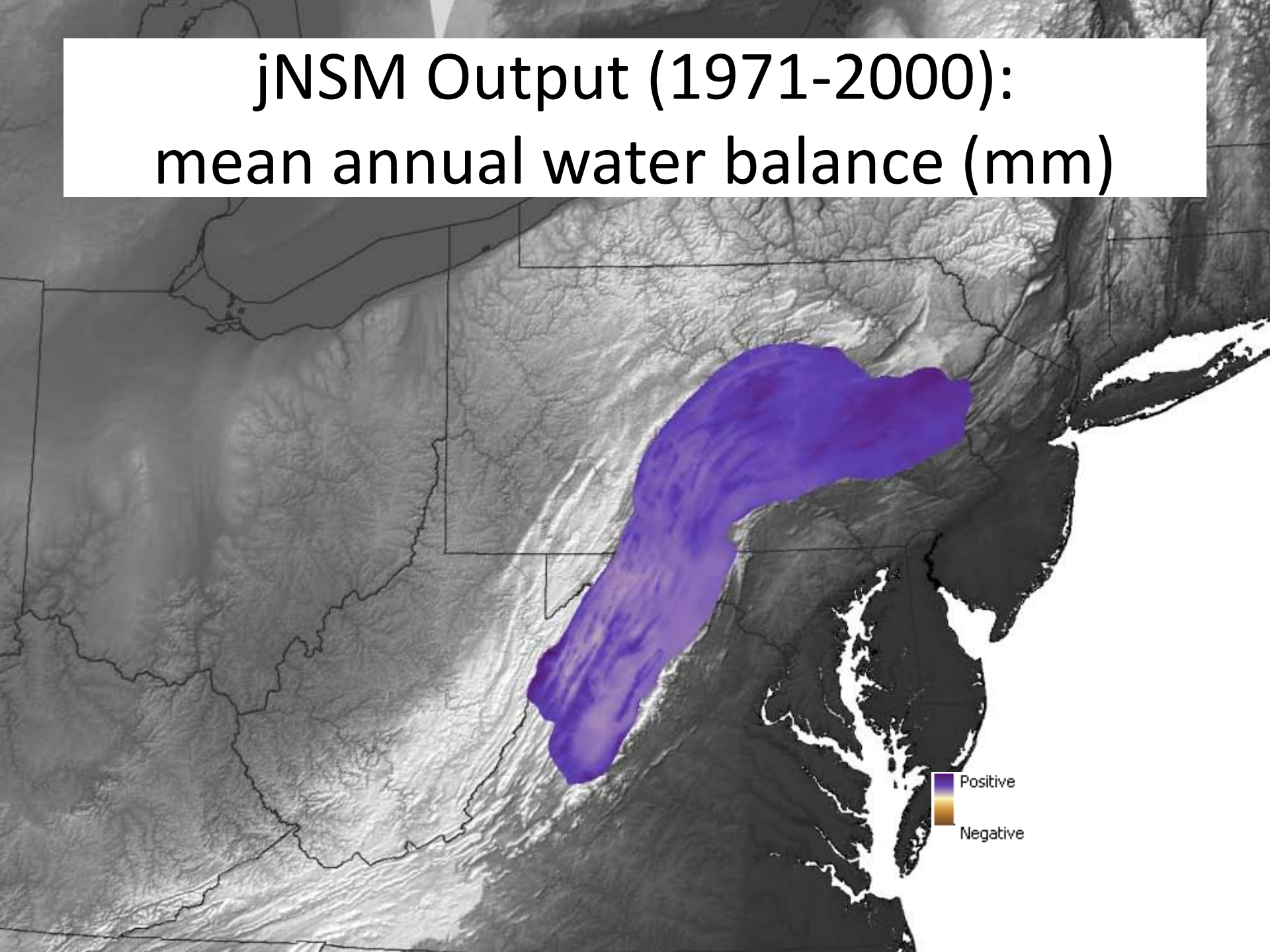
1 grid cell= 1 jNSM input record and model run

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI
1	StationName	netType	LatDD	LonDD	elev	tJan	tFeb	tMar	tApr	tMay	tJun	tJul	tAug	tSep	tOct	tNov	tDec	pJan	pFeb	pMar	pApr	pMay	pJun	pJul	pAug	pSep	pOct	pNov	pDec	pdType	pdStartY	pdEndY	awc	maatmast	cntryCode stP
2	CELL 10	PRISM CELL	-76.89	41.37	461	-5.26	-4.05	1.07	7.30	13.36	17.87	20.44	19.48	15.17	9.02	3.53	-2.35	72.44	63.84	82.35	88.52	98.08	117.26	102.18	87.12	103.98	83.06	89.79	73.92	Normal	1971	2000	200.00	1.20	USA

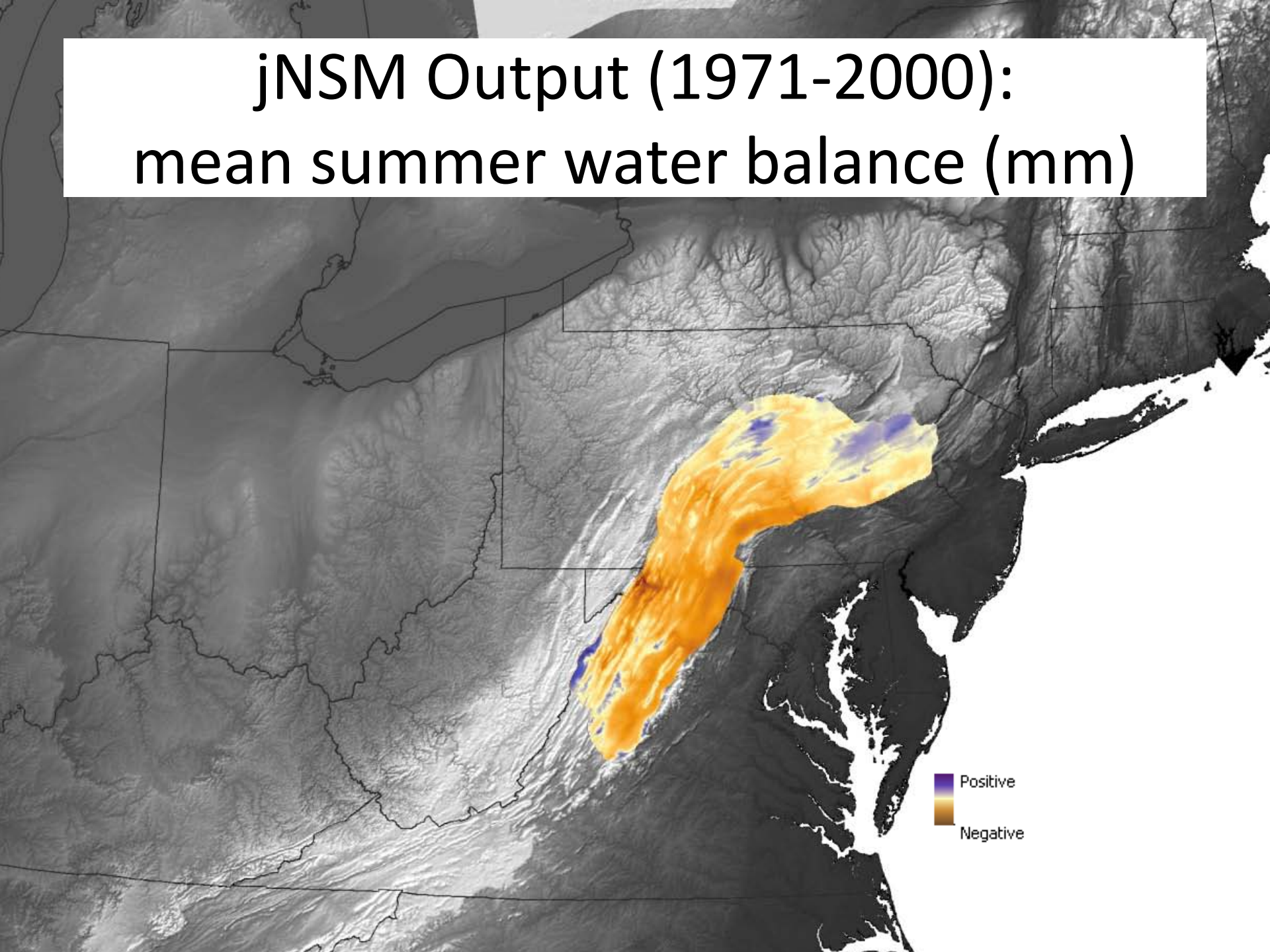
Study Site: MLRA 147
1970 – 2000 Soil Climate Summary



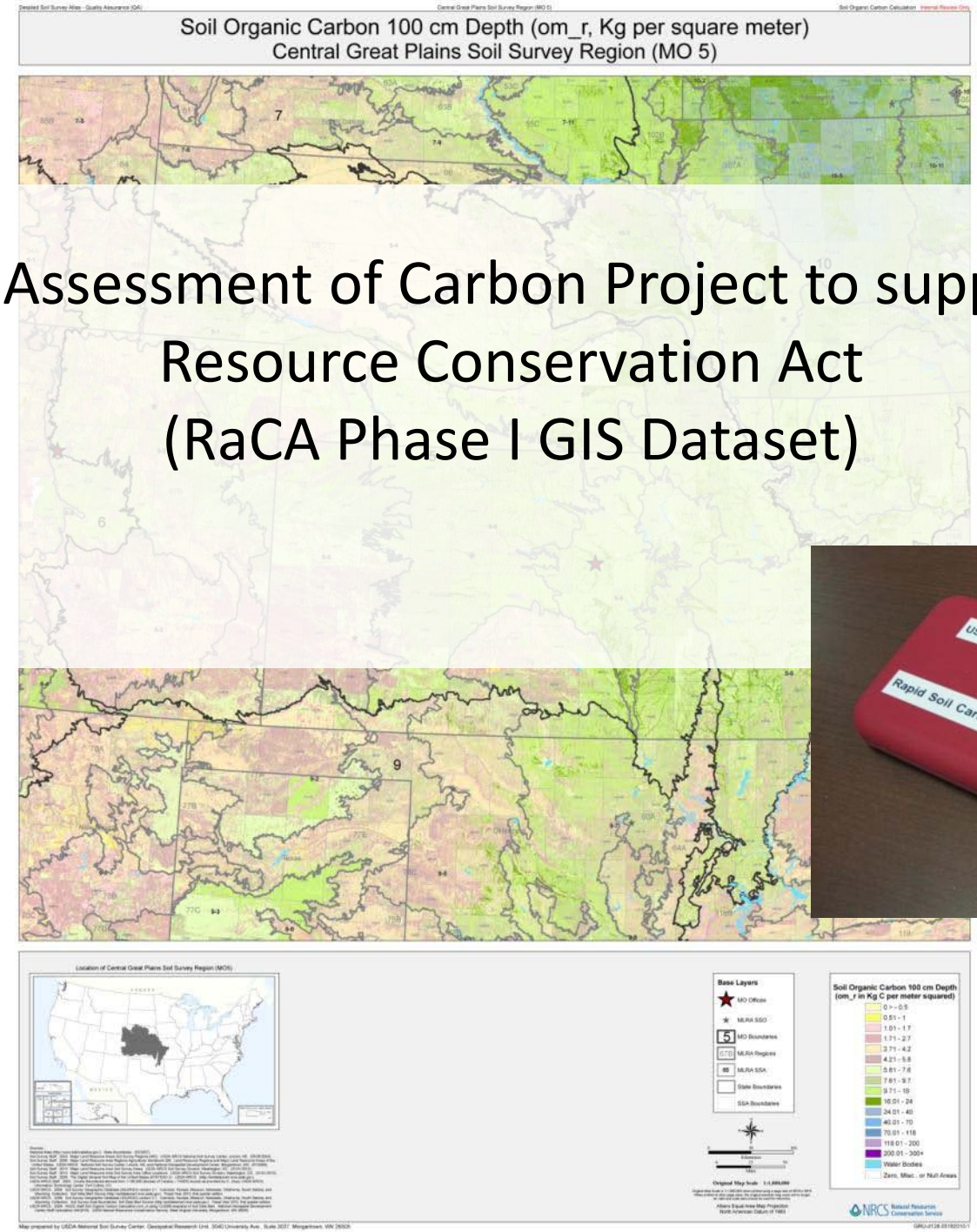
jNSM Output (1971-2000): mean annual water balance (mm)



jNSM Output (1971-2000): mean summer water balance (mm)

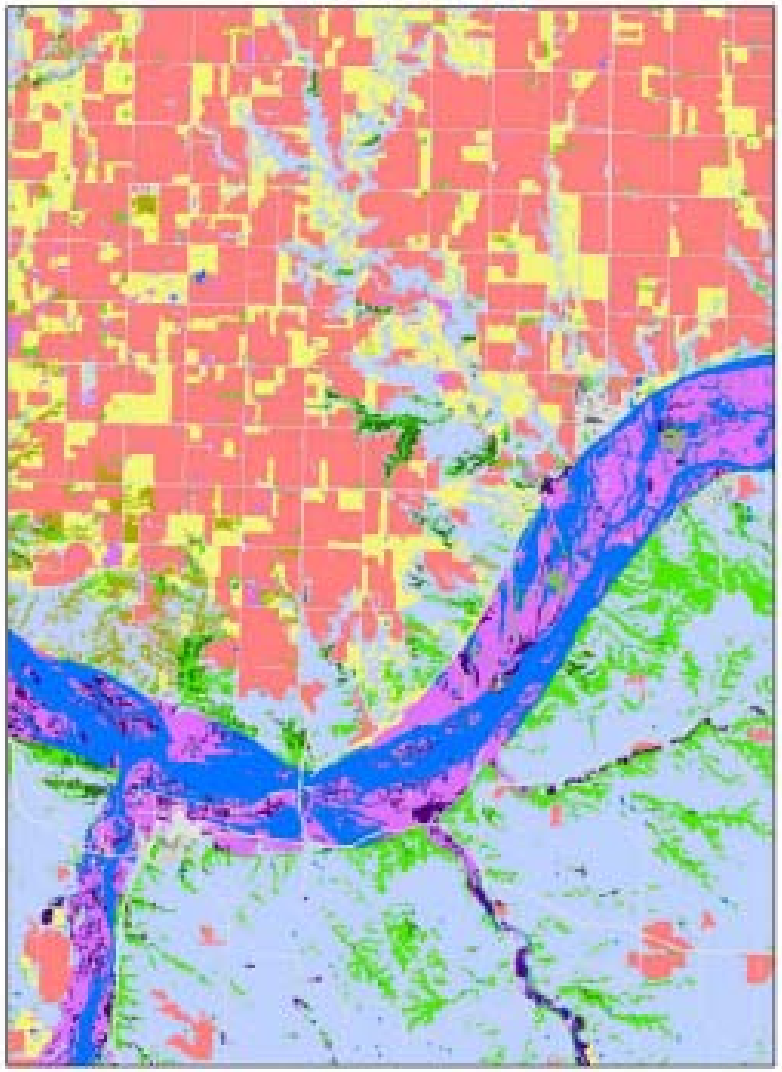


Rapid Assessment of Carbon Project to support the Resource Conservation Act (RaCA Phase I GIS Dataset)



NASS – Crop Data Layer (CDL)

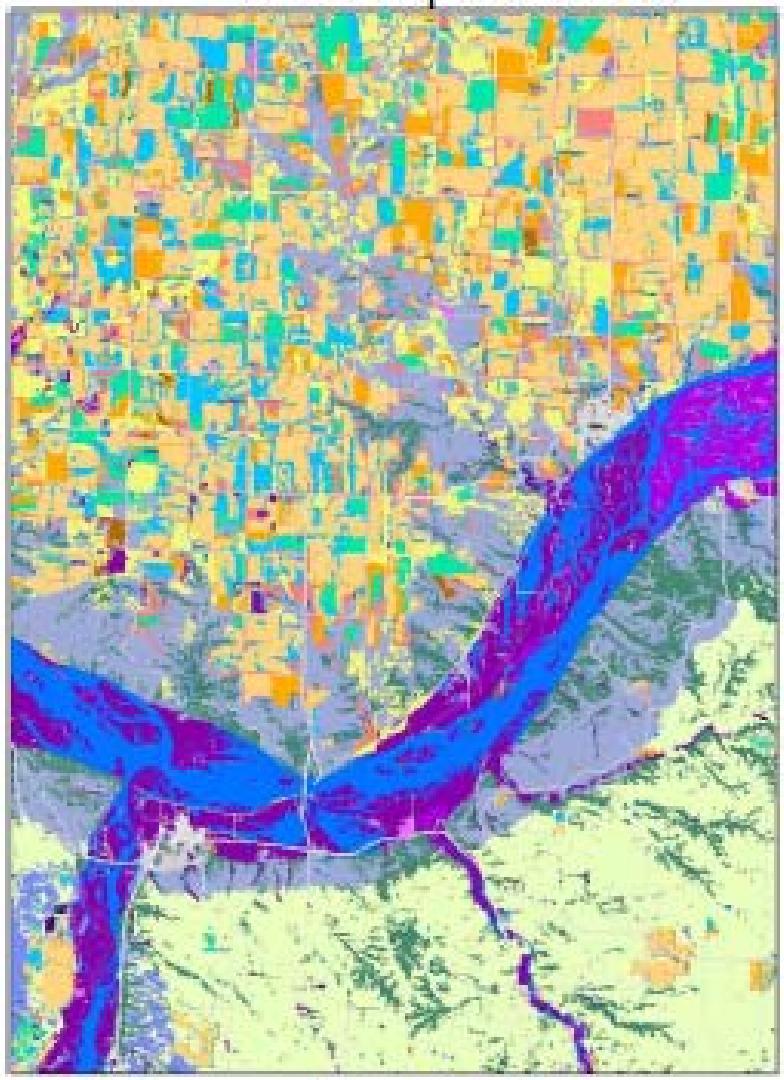
NLCD 2001



Pasture

Row crops

NLCD Expanded 2001



Corn monoculture

Pasture

Alfalfa/Hay

Soybean in rotation

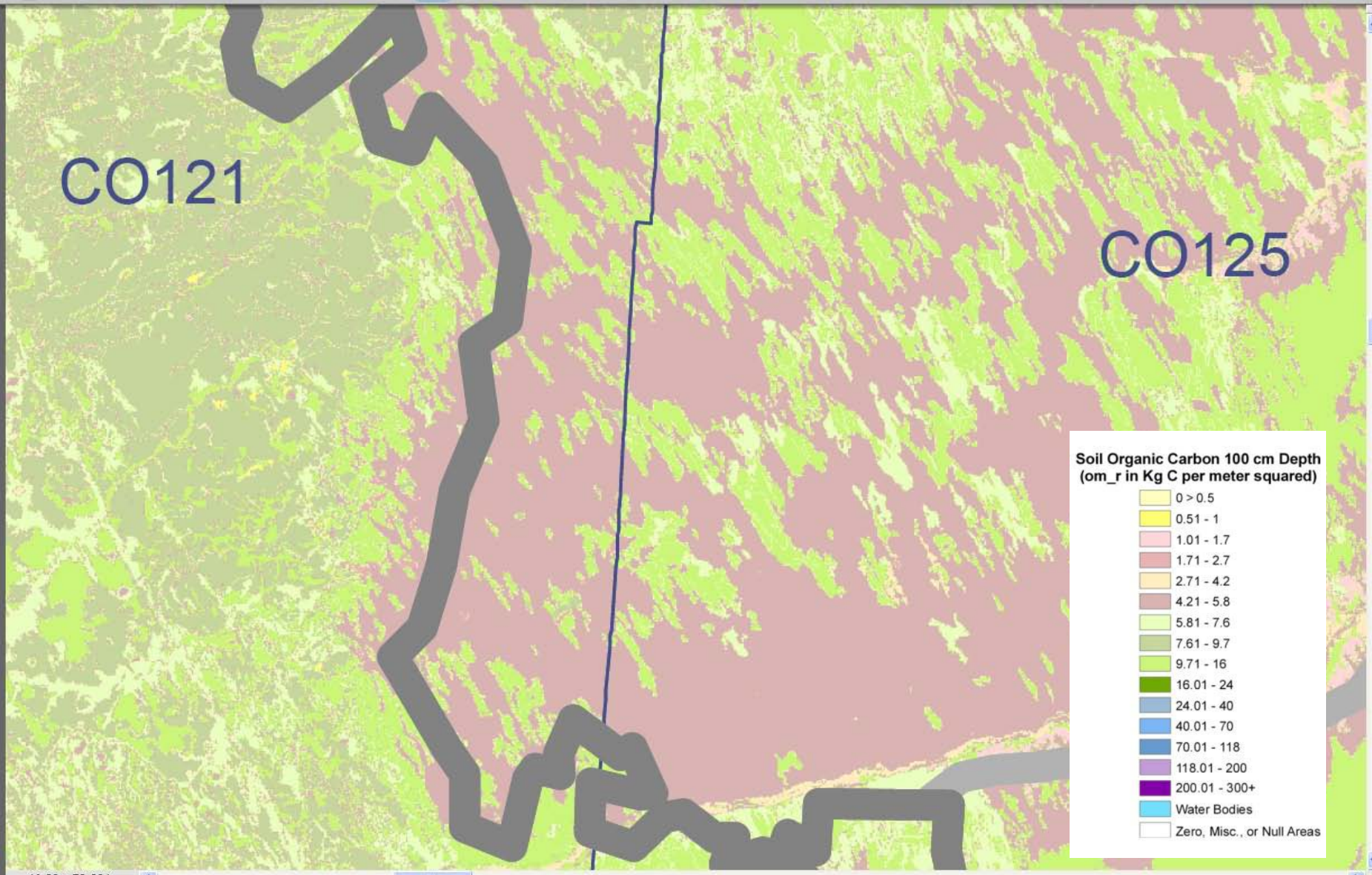
Corn in rotation

mo5_soc_05182010.pdf - Adobe Acrobat Professional

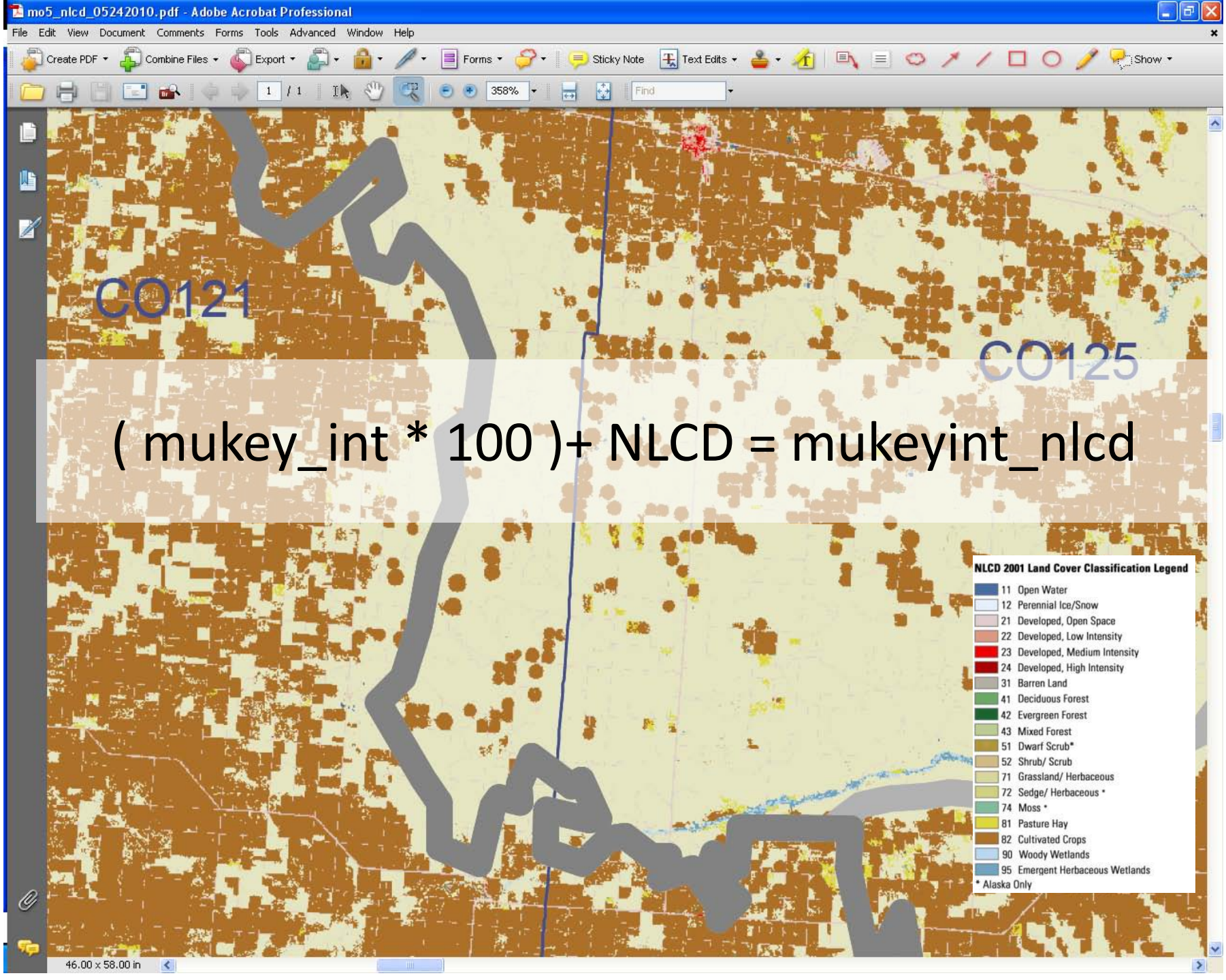
File Edit View Document Comments Forms Tools Advanced Window Help

Create PDF Combine Files Export Forms Sticky Note Text Edits Show

1 / 1 357% Find



46.00 x 58.00 in



(mukey_int * 100)+ NLCD = mukeyint_nlcd

Microsoft SQL Server Management Studio

File Edit View Query Debug Tools Window Community Help

New Query | SDM | Execute

Object Explorer

Connect

- sdeserver-sql (SQL Server
  - Databases
    - System Databases
    - Database Snapshots
    - calestmp
    - dm_cache
    - DVSMS
    - nasis6
    - NCSS
    - nsgd
    - scf_021910
    - SDM
      - Database Diagrar
      - Tables
        - System Tables
        - aburkholder.aa
        - aburkholder.ps
        - aburkholder.ps
        - aburkholder.ps
        - aburkholder.ps
        - aburkholder.ps
        - aburkholder.ps
        - aburkholder.ps
        - dbo.area
        - dbo.areatype
        - dbo.chaashto
        - dbo.chconsiste
        - dbo.chdesgnsu
        - dbo.chfrags
        - dbo.chorizon
        - dbo.chpores
        - dbo.chstruct
        - dbo.chstructgr
        - dbo.chtext
        - dbo.chtexture
        - dbo.chtextureg
        - dbo.chtexturen
        - dbo.chunified
        - dbo.clippolygc
        - dbo.cocanopyc
        - dbo.cocropyld
        - dbo.codiagfea
        - dbo.coecoclass
        - dbo.coeplants

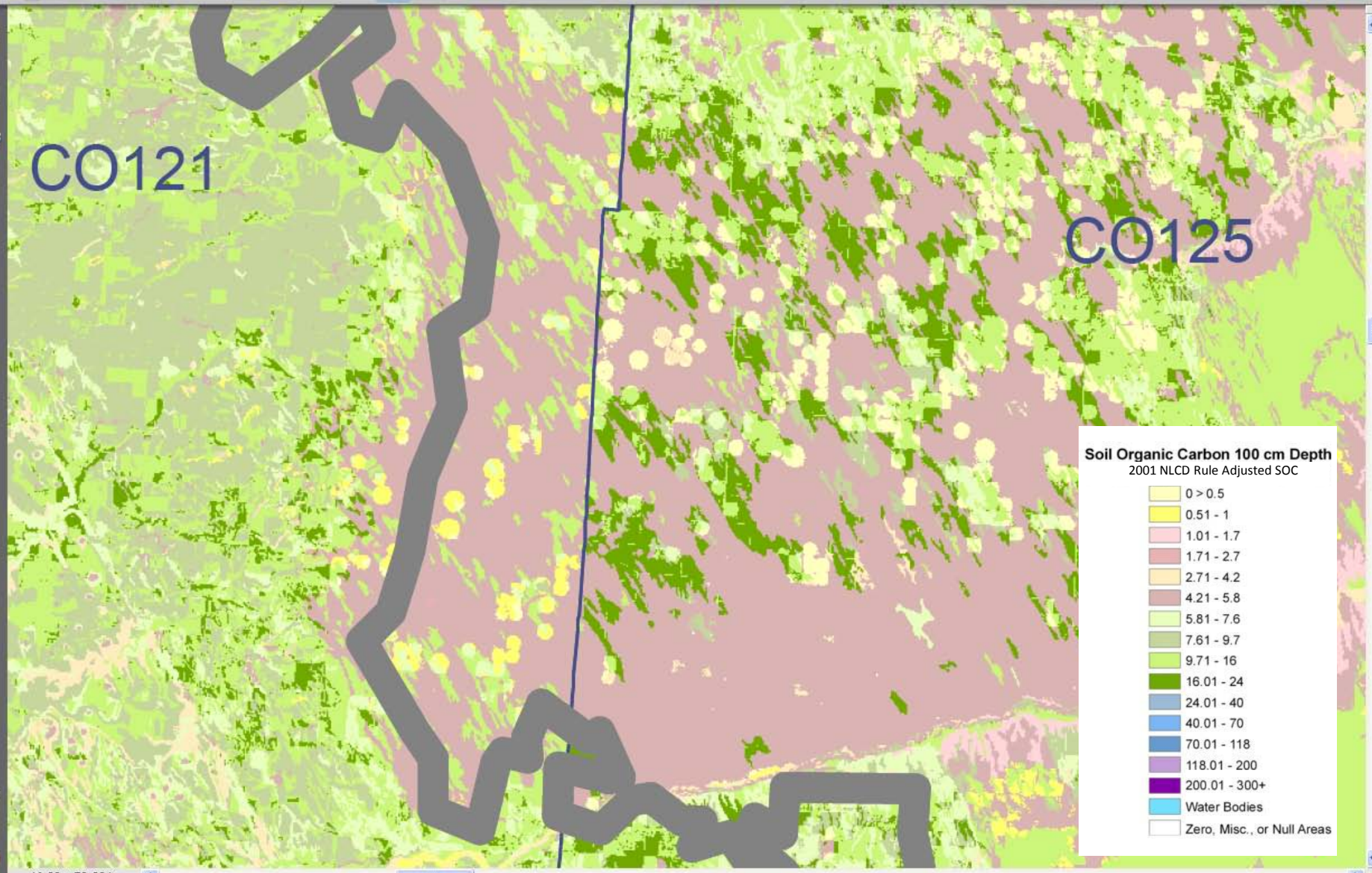
distinct_mukeys_f...DC\swaltman (54)) | SQLQuery2.sql - ...DC\swaltman (53)) | SQLQuery1.sql - ...DC\swaltman (52))

```
--Step 3.3 write (9) exception rules and apply to calculation NLCD adjusted mass values
USE SDM
SELECT *, 'mu_pixel_soc_100cm_g_m2' =
            CASE
             --exception for DecidFor 41
               WHEN Dom_NLCD = 41 AND NLCD = '82' THEN om_l_carbon_g_m2
               WHEN Dom_NLCD = 41 AND NLCD = '90' THEN om_h_carbon_g_m2
               WHEN Dom_NLCD = 41 AND NLCD = '95' THEN om_h_carbon_g_m2
             --exception for EvGrFor 42
               WHEN Dom_NLCD = 42 AND NLCD = '82' THEN om_l_carbon_g_m2
               WHEN Dom_NLCD = 42 AND NLCD = '90' THEN om_h_carbon_g_m2
               WHEN Dom_NLCD = 42 AND NLCD = '95' THEN om_h_carbon_g_m2
             --exception for MixedFor 43
               WHEN Dom_NLCD = 43 AND NLCD = '82' THEN om_l_carbon_g_m2
               WHEN Dom_NLCD = 43 AND NLCD = '90' THEN om_h_carbon_g_m2
               WHEN Dom_NLCD = 43 AND NLCD = '95' THEN om_h_carbon_g_m2
             --exception for ShrubScrub 52
               WHEN Dom_NLCD = 52 AND NLCD = '82' THEN om_l_carbon_g_m2
               WHEN Dom_NLCD = 52 AND NLCD = '90' THEN om_h_carbon_g_m2
               WHEN Dom_NLCD = 52 AND NLCD = '95' THEN om_h_carbon_g_m2
             --exception for GrassHerb 71
               WHEN Dom_NLCD = 71 AND NLCD = '82' THEN om_l_carbon_g_m2
               WHEN Dom_NLCD = 71 AND NLCD = '90' THEN om_h_carbon_g_m2
               WHEN Dom_NLCD = 71 AND NLCD = '95' THEN om_h_carbon_g_m2
             --exception for PastureHay 81
               WHEN Dom_NLCD = 81 AND NLCD = '82' THEN om_l_carbon_g_m2
               WHEN Dom_NLCD = 81 AND NLCD = '90' THEN om_h_carbon_g_m2
               WHEN Dom_NLCD = 81 AND NLCD = '95' THEN om_h_carbon_g_m2
             --exception for CultivCrop 82
               WHEN Dom_NLCD = 82 AND NLCD = '41' THEN om_h_carbon_g_m2
               WHEN Dom_NLCD = 82 AND NLCD = '42' THEN om_h_carbon_g_m2
               WHEN Dom_NLCD = 82 AND NLCD = '43' THEN om_h_carbon_g_m2
               WHEN Dom_NLCD = 82 AND NLCD = '71' THEN om_h_carbon_g_m2
               WHEN Dom_NLCD = 82 AND NLCD = '81' THEN om_h_carbon_g_m2
               WHEN Dom_NLCD = 82 AND NLCD = '90' THEN om_h_carbon_g_m2
               WHEN Dom_NLCD = 82 AND NLCD = '95' THEN om_h_carbon_g_m2
             --exception for WoodyWet 90
               WHEN Dom_NLCD = 90 AND NLCD = '52' THEN om_l_carbon_g_m2
               WHEN Dom_NLCD = 90 AND NLCD = '81' THEN om_l_carbon_g_m2
               WHEN Dom_NLCD = 90 AND NLCD = '82' THEN om_l_carbon_g_m2
             --exception for EmergWet 95
               WHEN Dom_NLCD = 95 AND NLCD = '52' THEN om_l_carbon_g_m2
               WHEN Dom_NLCD = 95 AND NLCD = '81' THEN om_l_carbon_g_m2
               WHEN Dom_NLCD = 95 AND NLCD = '82' THEN om_l_carbon_g_m2
               ELSE om_r_carbon_g_m2
             END
  INTO rac_count_mukeyint_nlcd_mlra_lrr_DomNLCD_om_l_r_h
```

Connected. (1/1) | sdeserver-sql (9.0 SP2) | NGDC\swaltman (54) | SDM | 00:00:00 | 0 rows

Ready | Ln 1 | Col 1 | Ch 1 | INS

mo5_soc_nlcd_06292010_2.pdf - Adobe Acrobat Professional



46.00 x 58.00 in

Gridded SSURGO

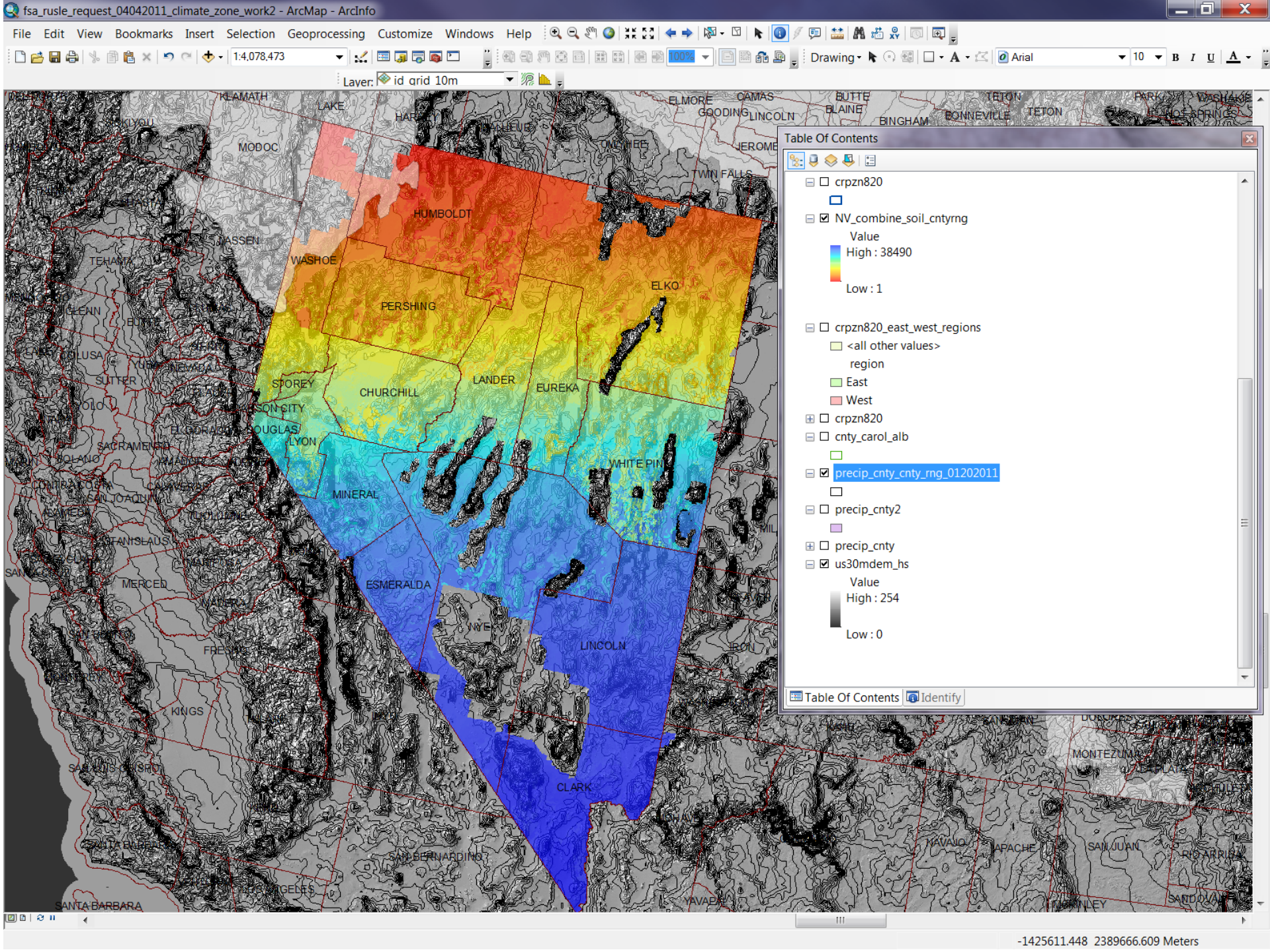
Deep root zone soils (left) provide greater available water capacity (AWC) than shallow root zone soils (right) Hagerstown soils, Centre Co, PA.

Could be used by relatively new clients

- USDA-NRCS (Conservation Planning CDSI)

- USDA – Farm Services Agency Request for National RUSLE2 run
  - 10 meter resolution gSSURGO + climate layers

NRCS


fsa_rusle_request_04042011_climate_zone_work2 - ArcMap - ArcInfo
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
1:4,078,473
Layer: id grid 10m
Table Of Contents
crpzn820
NV_combine_soil_cntyrng
Value
High : 38490
Low : 1
crpzn820_east_west_regions
<all other values>
region
East
West
crpzn820
cnty_carol_alb
precip_cnty_cnty_rng_01202011
precip_cnty2
precip_cnty
us30mdem_hs
Value
High : 254
Low : 0
Table Of Contents
Identify
HUMBOLDT
WASHOE
PERSHING
ELKO
CHURCHILL
LANDER
EUREKA
STOREY
MINERAL
WHITE PINE
ESMERALDA
LINCOLN
CLARK
KINGS
MERCED
SANTA BARBARA
-1425611.448 2389666.609 Meters

fsa_rusle_request_04042011_climate_zone_work2 - ArcMap - ArcInfo

File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help

1:836,912 Drawing Arial 10

Layer: id_grid_10m

PERSHING

CHURCHILL

LANDER

EUREKA

NYE

Identify

Identify from: NV_combine_soil_cntyrng

NV_combine_soil_cntyrng
19198

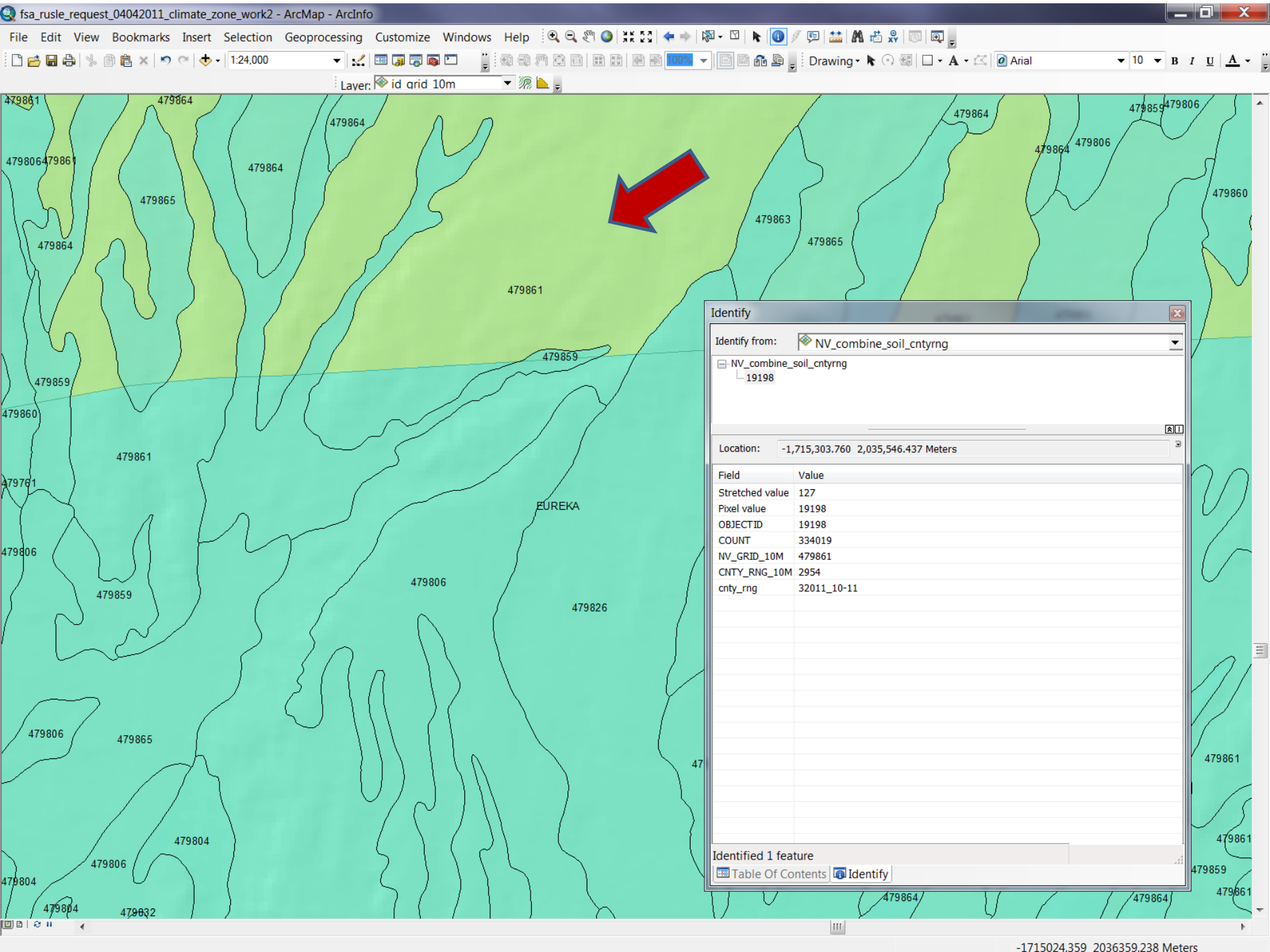
Location: -1,715,095.439 2,035,804.744 Meters

Field	Value
Stretched value	127
Pixel value	19198
OBJECTID	19198
COUNT	334019
NV_GRID_10M	479861
CNTY_RNG_10M	2954
cnty_rng	32011_10-11

Identified 1 feature

Table Of Contents Identify

-1698797.938 2113395.022 Meters


fsa_rusle_request_04042011_climate_zone_work2 - ArcMap - ArcInfo
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
1:24,000
Drawing
Arial
10
Layer: id_grid_10m
479861
479864
479865
479863
479859
479860
479806
479804
479832
479826
EUREKA
Identify
Identify from: NV_combine_soil_cntyrng
NV_combine_soil_cntyrng
19198
Location: -1,715,303.760 2,035,546.437 Meters
Field Value
Stretched value 127
Pixel value 19198
OBJECTID 19198
COUNT 334019
NV_GRID_10M 479861
CNTY_RNG_10M 2954
cnty_rng 32011_10-11
Identified 1 feature
Table Of Contents
Identify
-1715024.359 2036359.238 Meters

Potential Wetlands Soil Landscapes Query

Microsoft SQL Server Management Studio

File Edit View Query Debug Tools Window Community Help

New Query | SDM | Execute

Object Explorer

Connect

- irrcapscl (varchar(254), null)
- irrcapunit (smallint, null)
- cropprodindex (smallint, null)
- constreeshrubgrp (varchar(254), null
- wndbrksuitgrp (varchar(254), null)
- rsprod_l (int, null)
- rsprod_r (int, null)
- rsprod_h (int, null)
- foragesuitgrpid (varchar(11), null)
- wlgrain (varchar(254), null)
- wlgrass (varchar(254), null)
- wlherbaceous (varchar(254), null)
- wlshrub (varchar(254), null)
- wlconiferous (varchar(254), null)
- wlhardwood (varchar(254), null)
- wlwetplant (varchar(254), null)
- wlshallowwat (varchar(254), null)
- wlrangeland (varchar(254), null)
- wlopenland (varchar(254), null)
- wlwoodland (varchar(254), null)
- wlwetland (varchar(254), null)
- soilslippot (varchar(254), null)
- frostact (varchar(254), null)
- initsub_l (smallint, null)
- initsub_r (smallint, null)
- initsub_h (smallint, null)
- totalsub_l (smallint, null)
- totalsub_r (smallint, null)
- totalsub_h (smallint, null)
- hydgrp (varchar(254), null)
- corcon (varchar(254), null)
- corsteel (varchar(254), null)
- taxclname (varchar(120), null)
- taxorder (varchar(254), null)
- taxsuborder (varchar(254), null)
- taxgrtgroup (varchar(254), null)
- taxsubgrp (varchar(254), null)
- taxpartsize (varchar(254), null)
- taxpartsizemod (varchar(254), null)
- taxceactcl (varchar(254), null)
- taxreaction (varchar(254), null)
- taxtempcl (varchar(254), null)
- taxmoistscl (varchar(254), null)
- taxtempregime (varchar(254), null)

hydric_like_shan_...GDC\swaltman (64)) | SQLQuery13.sql -...DC\swaltman (77)) | SQLQuery12.sql - ...DC\swaltman (76))

```
--
USE SDM

SELECT areatypename, areasymbol, areaname, ssastatus, projectscale, cordate,
       mukey, musym, muname, compname, comppct_r, compkind, majcompflag, hydricon, hydricrating, hydgrp,
       drainagecl, cokey
   INTO hydric_like_ssurgo_mu_comp
    FROM ssurgo_mu_comp
      WHERE hydricrating = 'YES'
            OR
            hydricrating = 'UNRANKED' AND drainagecl = 'Poorly drained'
            OR hydricrating = 'UNRANKED' AND drainagecl = 'Very poorly drained'
            OR muname LIKE '% drained%' AND hydricrating = 'UNRANKED'
            OR localphase LIKE '% drained%' AND hydricrating = 'UNRANKED'
            OR muname LIKE '% undrained%' AND hydricrating = 'UNRANKED'
            OR localphase LIKE '% undrained%' AND hydricrating = 'UNRANKED'
            OR muname LIKE '% channeled%' AND hydricrating = 'UNRANKED'
            OR localphase LIKE '% channeled%' AND hydricrating = 'UNRANKED'
            OR muname LIKE '%protected%' AND hydricrating = 'UNRANKED'
            OR localphase LIKE '%protected%' AND hydricrating = 'UNRANKED'
            OR muname LIKE '% rarely ponded %' AND hydricrating = 'UNRANKED'
            OR localphase LIKE '% rarely ponded %' AND hydricrating = 'UNRANKED'
            OR muname LIKE '% rarely flooded%'  AND hydricrating = 'UNRANKED'
            OR localphase LIKE '% rarely flooded%' AND hydricrating = 'UNRANKED'
            OR hydgrp = 'D' AND hydricrating = 'UNRANKED'


GO
    --(135829 row(s) affected)first
    --(135829 row(s) affected)second
    --(137057 row(s) affected)third iteration
```

Results | Messages

	easym...	areaname	cordate	mukey	musym	muname	sum_comp...	hydric_like_fl...
1	E017	Brown County, Nebraska	1987-07-01 00:00:00.000	100001	3200	Johnstown fine sandy loam, 0 to 2 percent slopes	1	1
2	O077	Greene County, Missouri	2005-11-01 00:00:00.000	1000012	70139	Parsons-Sacville complex, 1 to 3 percent slopes	44	1
3	O109	Lawrence County, Missouri	2005-11-01 00:00:00.000	1000013	70139	Parsons-Sacville complex, 1 to 3 percent slopes	44	1
4	O077	Greene County, Missouri	2005-11-01 00:00:00.000	1000014	46000	Humansville silt loam, 0 to 2 percent slopes, fre...	94	1
5	O109	Lawrence County, Missouri	2005-11-01 00:00:00.000	1000015	46000	Humansville silt loam, 0 to 2 percent slopes, fre...	94	1
6	O077	Greene County, Missouri	2005-11-01 00:00:00.000	1000016	70127	Needleye silt loam, 1 to 3 percent slopes	4	1
7	O109	Lawrence County, Missouri	2005-11-01 00:00:00.000	1000017	70127	Needleye silt loam, 1 to 3 percent slopes	4	1
8	O109	Lawrence County, Missouri	2005-11-01 00:00:00.000	1000019	40008	Parsons silt loam, 0 to 1 percent slopes	5	1
9	O077	Greene County, Missouri	2005-11-01 00:00:00.000	1000020	73010	Wilderness gravelly silt loam, 3 to 8 percent slo...	2	1
10	O109	Lawrence County, Missouri	2005-11-01 00:00:00.000	1000021	73010	Wilderness gravelly silt loam, 3 to 8 percent slo...	2	1
11	O077	Greene County, Missouri	2005-11-01 00:00:00.000	1000024	73008	Viraton silt loam, 2 to 5 percent slopes	4	1

Query executed successfully. | sdeserver-sql (9.0 SP2) | NGDC\swaltman (64) | SDM | 00:00:01 | 87087 rows

Item(s) Saved | Ln 130 | Col 3 | Ch 3 | INS

mu_hydric_like_summary - ArcMap - ArcInfo

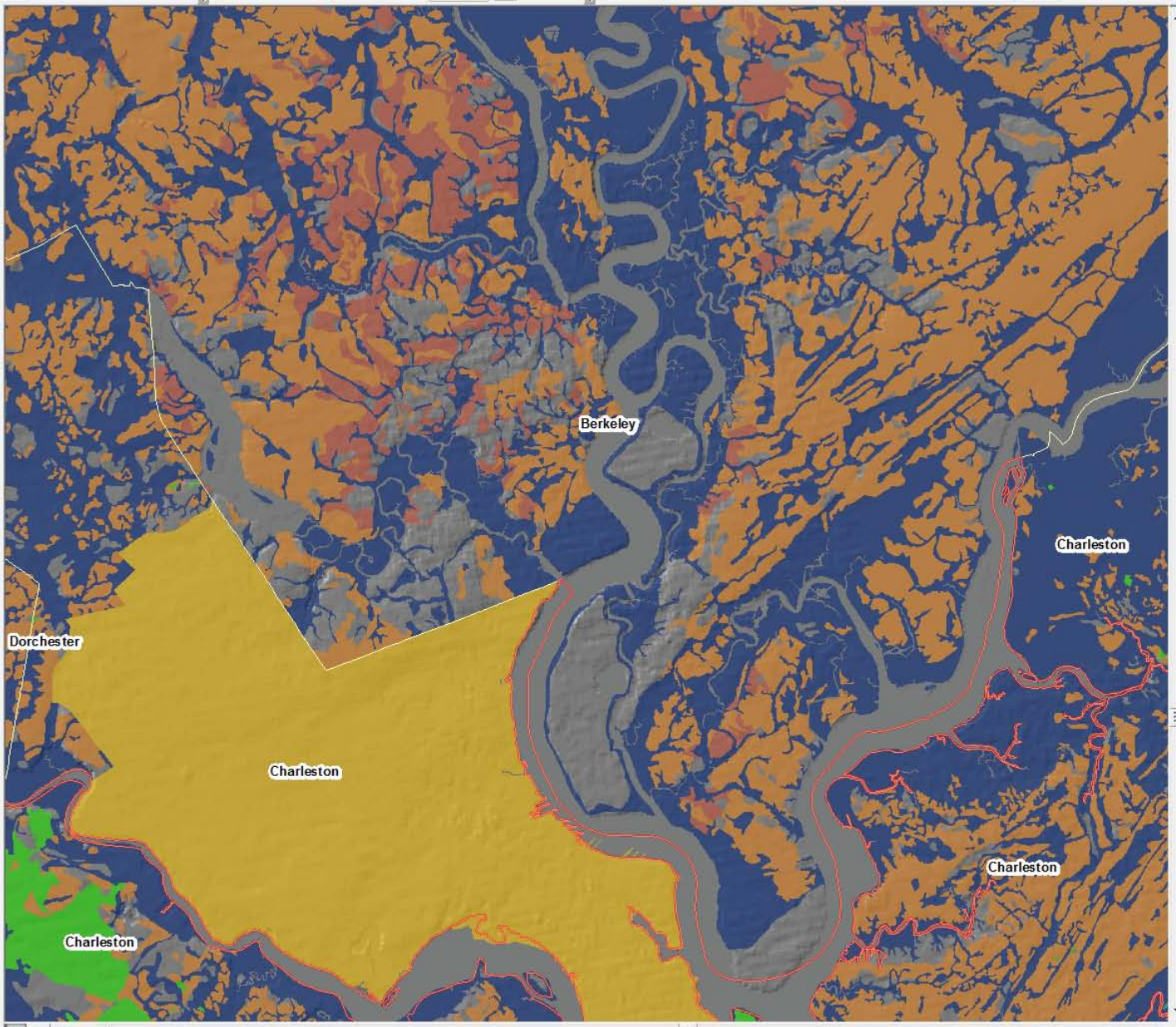
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help

1:109,241

Drawing Arial 10

Table Of Contents

- Layers
  - base_BASE_STATES_A_UST
  - cnty_carol_alb
  - sc_grid_10m
    - hydric_like_ssurgo_mu_comp_flag_summ_nonulls
    - 1
    - 2 - 10
    - 11 - 20
    - 21 - 30
    - 31 - 40
    - 41 - 60
    - 61 - 80
    - 81 - 100
    - NULL
  - co_q1_aea
  - ca_q1_aea
  - problem_child_ssa_ca_cot
  - SDM.DBO.SAPOLYGON
  - SDM.DBO.SASTATUSMAP
    - <all other values>
    - SAPUBSTATUSNAME
    - SSURGO 2.1 in Soil Data Mart
    - Tabular Only in Soil Data Mart
    - Unpublished
  - SDM.DBO.MUPOLYGON
  - cnty_carol_alb
  - us30mdem_hs
    - Value
    - High : 254
    - Low : 0



-79.986 33.035 Decimal Degrees

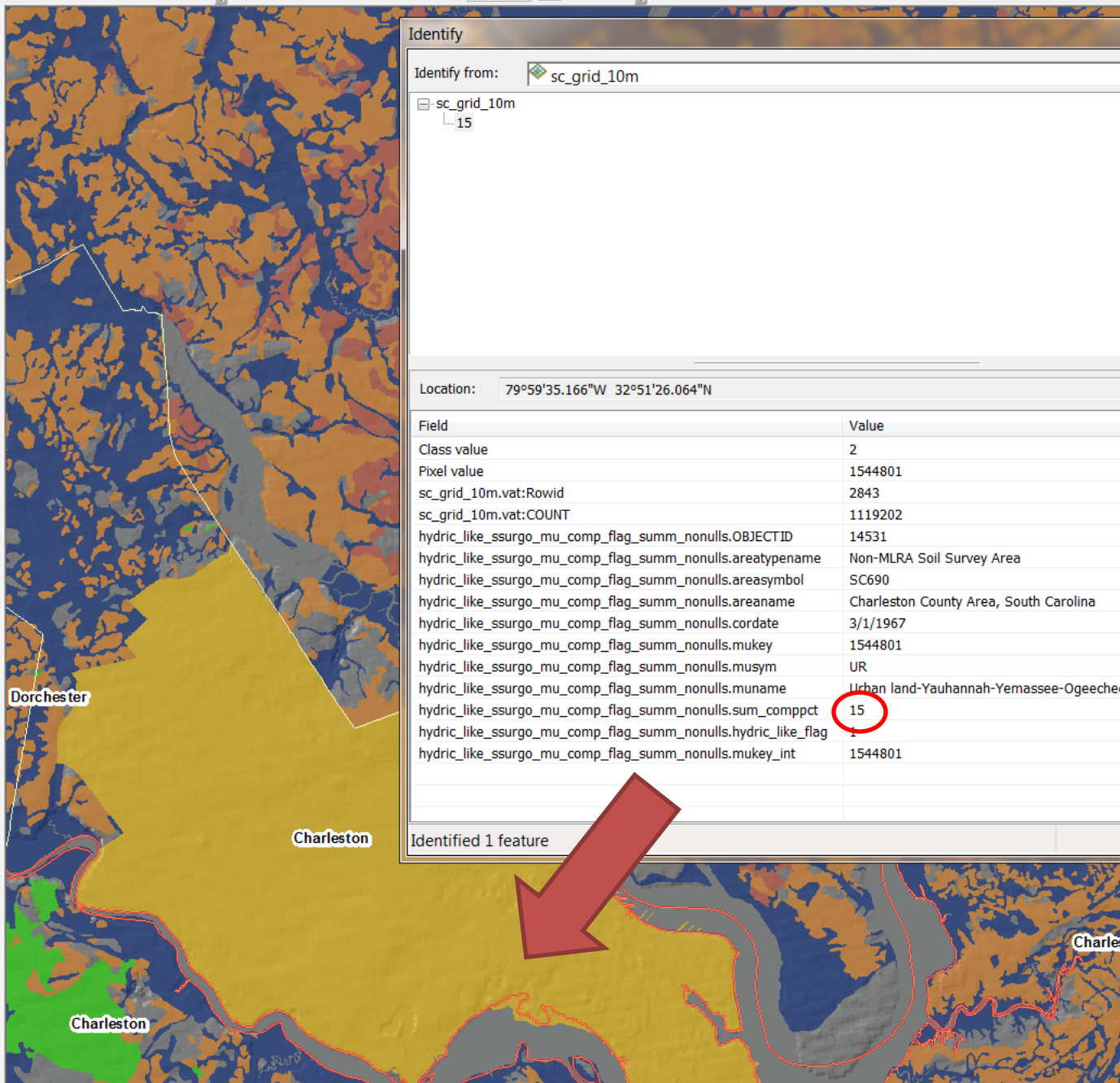
mu_hydric_like_summary - ArcMap - ArcInfo

File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help

1:109,241 | Drawing | Arial

Table Of Contents

- Layers
  - base_BASE_STATES_A_UST
  - cnty_carol_alb
  - sc_grid_10m
    - hydric_like_ssurgo_mu_comp_flag_summ_nonulls
    - 1
    - 2 - 10
    - 11 - 20
    - 21 - 30
    - 31 - 40
    - 41 - 60
    - 61 - 80
    - 81 - 100
    - NULL
  - co_q1_aea
  - ca_q1_aea
  - problem_child_ssa_ca_cot
  - SDM.DBO.SAPOLYGON
  - SDM.DBO.SASTATUSMAP
    - <all other values>
    - SAPUBSTATUSNAME
    - SSURGO 2.1 in Soil Data Mart
    - Tabular Only in Soil Data Mart
    - Unpublished
  - SDM.DBO.MUPOLYGON
  - cnty_carol_alb
  - us30mdem_hs
    - Value
    - High : 254
    - Low : 0



Identify

Identify from: sc_grid_10m

- sc_grid_10m
  - 15

Location: 79°59'35.166"W 32°51'26.064"N

Field	Value
Class value	2
Pixel value	1544801
sc_grid_10m.vat:Rowid	2843
sc_grid_10m.vat:COUNT	1119202
hydric_like_ssurgo_mu_comp_flag_summ_nonulls.OBJECTID	14531
hydric_like_ssurgo_mu_comp_flag_summ_nonulls.areatypename	Non-MLRA Soil Survey Area
hydric_like_ssurgo_mu_comp_flag_summ_nonulls.areasymbol	SC690
hydric_like_ssurgo_mu_comp_flag_summ_nonulls.areaname	Charleston County Area, South Carolina
hydric_like_ssurgo_mu_comp_flag_summ_nonulls.cordate	3/1/1967
hydric_like_ssurgo_mu_comp_flag_summ_nonulls.mukey	1544801
hydric_like_ssurgo_mu_comp_flag_summ_nonulls.musym	UR
hydric_like_ssurgo_mu_comp_flag_summ_nonulls.muname	Urban land-Yauhannah-Yemassee-Ogeeche
hydric_like_ssurgo_mu_comp_flag_summ_nonulls.sum_comppct	15
hydric_like_ssurgo_mu_comp_flag_summ_nonulls.hydric_like_flag	1
hydric_like_ssurgo_mu_comp_flag_summ_nonulls.mukey_int	1544801

Identified 1 feature

Using a gridded national SSURGO database at Agricultural Research Service's

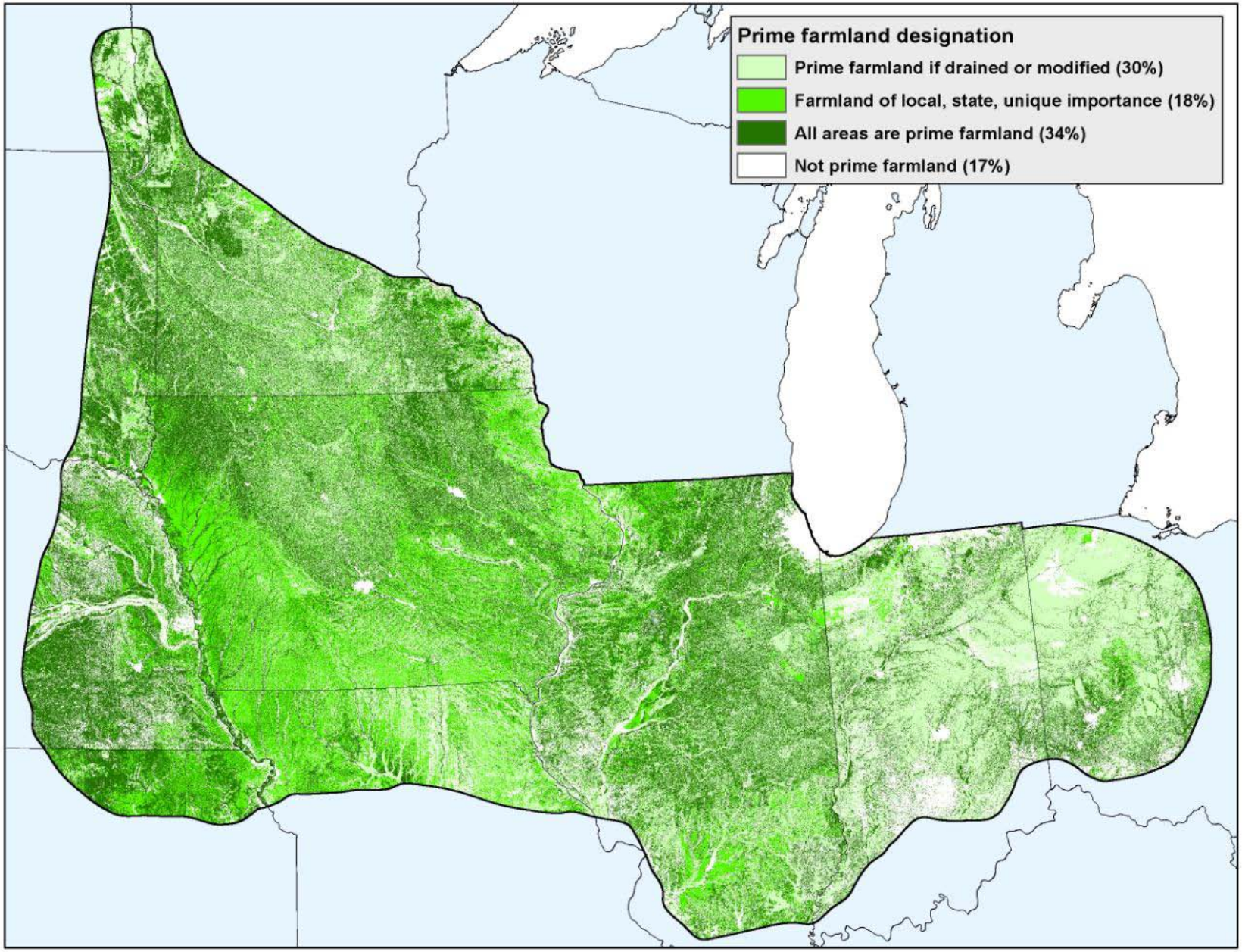
USDA ars

~~NATIONAL SOIL TILTH LABORATORY~~

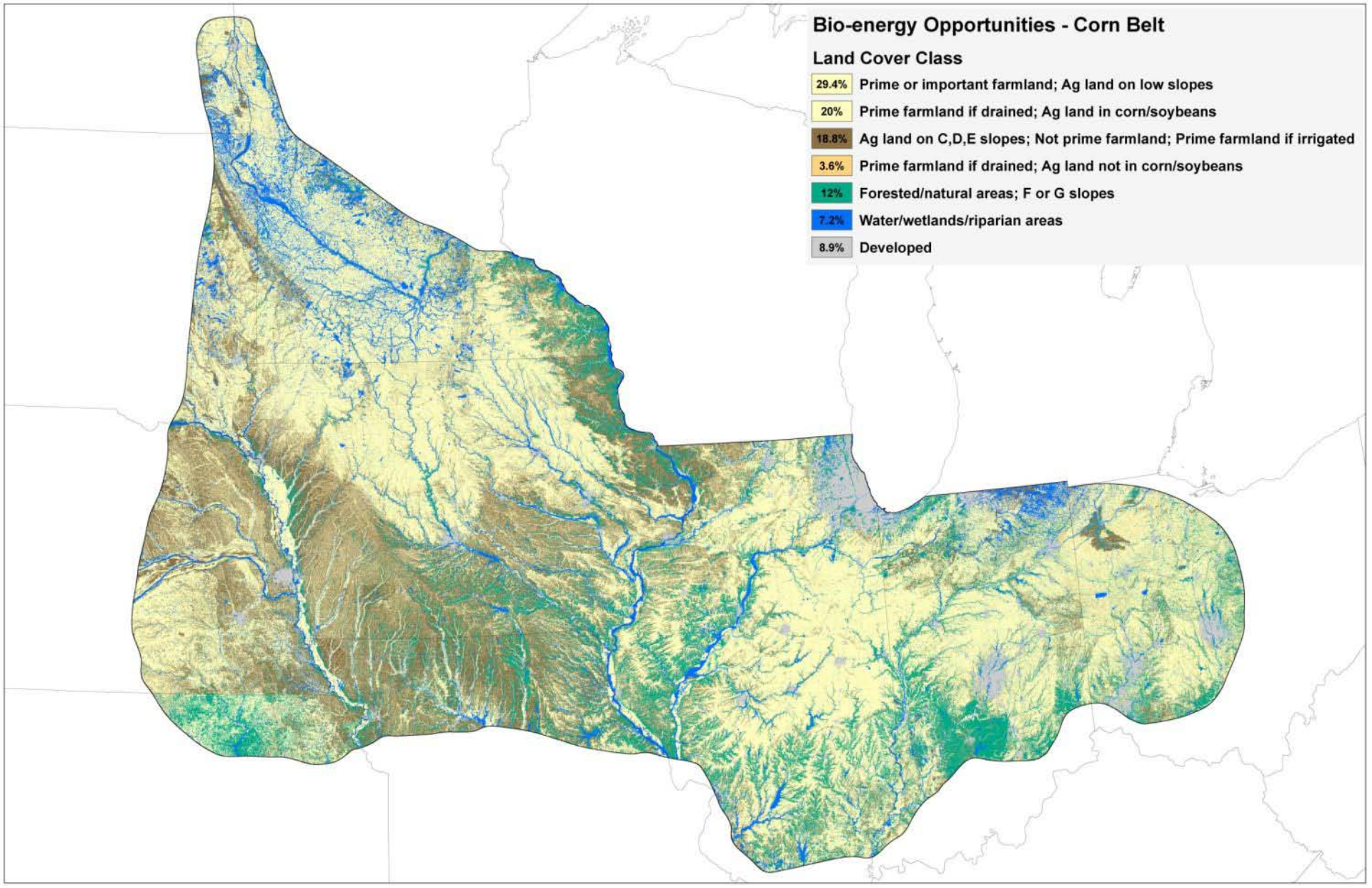
NLAE

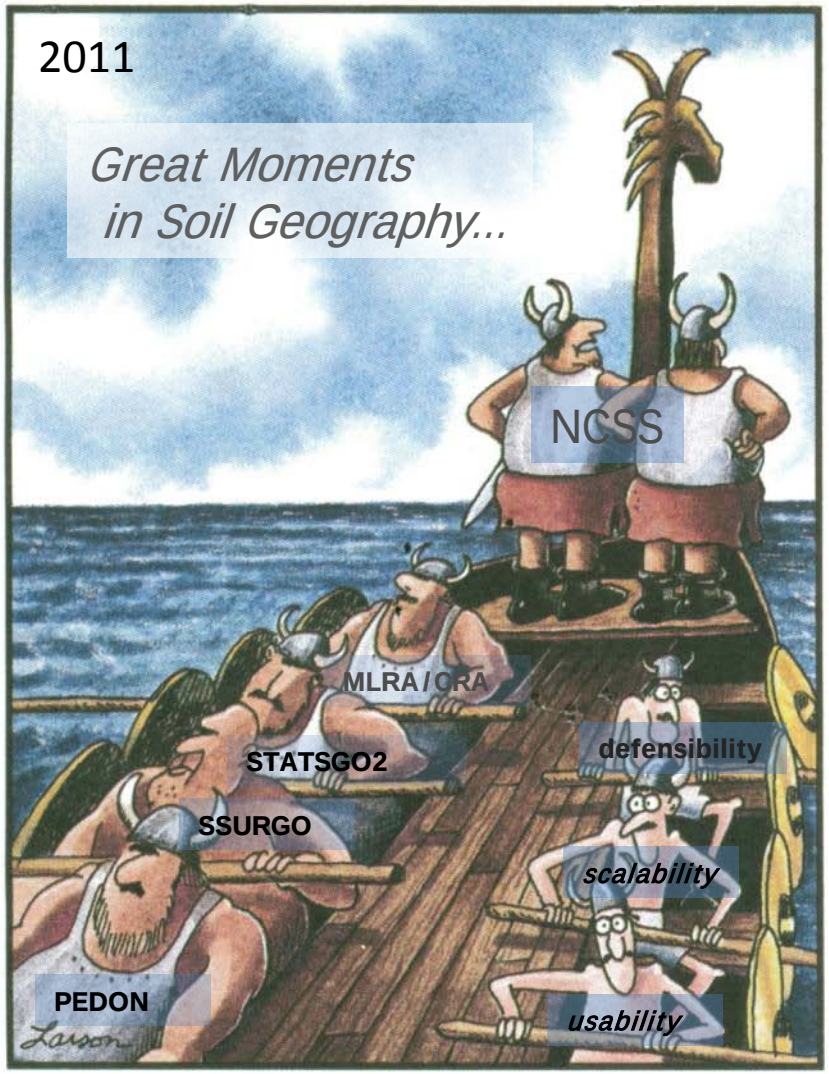
National Laboratory for Agriculture and the Environment

The Opportunities



The Result


Bio-energy Opportunities - Corn Belt
Land Cover Class
29.4% Prime or important farmland; Ag land on low slopes
20% Prime farmland if drained; Ag land in corn/soybeans
18.8% Ag land on C,D,E slopes; Not prime farmland; Prime farmland if irrigated
3.6% Prime farmland if drained; Ag land not in corn/soybeans
12% Forested/natural areas; F or G slopes
7.2% Water/wetlands/riparian areas
8.9% Developed



"I've got it, too, Omar … a strange feeling like we've just been going in circles."

Far Side Cartoons
Gary Larson

- END