The year 2006 marked the completion of the initial field mapping for the National Cooperative Soil Survey in Wisconsin. Wisconsin has had a rich and productive soil survey program. It was not until the latter part of the 1800’s that agricultural land use interest by the public and the United States Department of Agriculture (USDA) convinced the United States Congress to make an inventory of the nation’s soils and their production potential. This interest in 1899 created the soil survey program under the USDA Division of Soils, directed by Milton Whitney. Thereafter, soil survey became a cooperative effort between the U.S. Department of Agriculture and state agencies. The Wisconsin Geologic and Natural History Survey, the Soil Department at the University of Wisconsin, and the U.S. Bureau of Soils did much of the early survey work.
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Workshop Agenda

Monday, November 9, 2015

1:00 pm Opening Remarks

Welcome and Workshop Purpose
The Wisconsin Cooperative Soil Survey is a partnership of federal, regional, state, and local agencies and institutions. This partnership works together to cooperatively investigate, inventory, document, classify, and interpret soils and to disseminate, publish, and promote the use of information about the soils. The purpose of the workshop is to bring our cooperators and other soil survey supporters up-to-date on soil survey activities in the state and to prioritize, plan and coordinate soil survey and technical soil services for future soil data use.

Workbook Discussion
Soil Updates, Technical Soil Services, Web Soil Survey

1:30 pm Reports By Cooperators

Each presentation will be 15 minutes with 5 minutes in between to switch presenters.

1:30 pm Chris Baxter, University of Wisconsin–Platteville
University Report

1:50 pm Tim Gerber, University of Wisconsin–La Crosse
Wetland Delineation Workshops

2:10 pm Peter Jacobs, University of Wisconsin–Whitewater
University Report

2:30 pm Sara Walling, Department of Agriculture, Trade and Consumer Protection
590 Fall N, Slope Restrictions, L&W Bureau Programs

2:50 pm Laura Good, University of Wisconsin–Madison
Nutrient Management Planning, SnapPlus, P Index

3:10 pm Carrie Laboski, University of Wisconsin–Madison
A2809 Soil Groups and Yield Potential

3:30 pm Break

3:40 pm Reports By Cooperators Continued

3:40 pm Joe Baeten, Wisconsin Department of Natural Resources
Nutrient Management Planning/SnapPlus/P Index

4:00 pm Bryant Scharenbroch, University of Wisconsin–Stevens Point
University Report

4:30 pm Adjourn
Tuesday, November 10, 2015

8:00 am  Reports By Cooperators Continued

8:00 am  Francisco Arriaga, University of Wisconsin–Madison
  Soil Health

8:20 am  Dustin Bronson, Wisconsin Department of Natural Resources
  Biomass Harvesting

8:40 am  Kent Peña, Natural Resource Conservation Service
  ArcGIS/Soil Tools

9:00 am  Karla Petges, Wisconsin Society of Professional Soil Scientists
  Organization Update

9:20 am  TBD, Wisconsin Association of Agriculture Consultants
  Organization Update

9:40 am  Break

9:50 am  NRCS Soil Division Priorities

MLRA Regional Offices

9:50 am  Chris Miller, Juneau, Wisconsin

10:10 am  Kevin Traastad, Onalaska, Wisconsin

10:30 am  Scott Eversoll, Rhinelander, Wisconsin

10:50 am  Ryan Dermody, Waverly, Iowa

11:10 am  NRCS–Wisconsin Soil Priorities

Phil Meyer, Area Resource Scientist (NE)
Jeremy Ziegler, Area Resource Scientist (SE)
Tim Miland, Area Resource Scientist (NW)
Jeff Deniger, Area Resource Scientist (SW)

11:40 am  Developing Recommendations for Future Collaboration

12:15 pm  Closing Remarks and Questions

12:30 pm  Adjourn
NRCS Soil Science Division: The Future

Phase 1 - Soil Data Join Recorrelation Initiative (SDJR)

The National Cooperative Soil Survey (NCSS) program under the leadership of the Natural Resources Conservation Service (NRCS) is charged by Congress to inventory the soils of the United States, interpret the soils for various uses, publish information to the public, and maintain the inventory to meet user needs.

Background

In the first 100 years of the National Cooperative Soil Survey (NCSS) Program, soil surveys were conducted county by county on the basis of State priorities and applied statewide and regional guidance documents in survey development. The application of soil survey data and maps was primarily at a local level for planning management. Material that was originally developed as information pertinent to a specific county is now being used on a broader scale, and data differences related to the product's vintage, design and completeness present challenges.

The Soil Science Division has positioned its future program by establishing MLRA soil survey regional offices and MLRA soil survey offices. The organization of these offices fosters the update of soils information in a manner that minimizes historical political or regional bias. Update of soils information will be based on typical conditions within the MLRA.

The Soil Data Join Recorrelation (SDJR) initiative accelerates the soil database improvement phase of the MLRA approach to soil survey within the National Cooperative Soil Survey (NCSS) program. This initiative will focus on creating a continuous and joined coverage within the attribute database through a process of data harmonization.

The Soil Data Join Recorrelation Initiative

Advances in computer technologies allow for sophisticated analysis and modeling of natural resource data across very large areas. The coverage of attribute and spatial data of the nation's soil resources available to the public is considered the 'first generation' of soil mapping. The next major effort is the Soil Data Join Recorrelation (SDJR) initiative. The SDJR Initiative begins the process of bringing attribute data to a common standard through "harmonization" and identifies future projects that require additional fieldwork.

Below on the left is a depiction of soil suitability for "Dwellings with Basements" as the SSURGO product currently would display. Abrupt straight boundaries from one color (suitability rating) to another represents a county line and vintage of survey and data values selected. The map on the right shows the rating after the SDJR "harmonization" is completed:
Basic Objectives

Basic objectives of the Soil Data Join Recorrelation Initiative include the following:

• Support the development of seamless soils data for use with Conservation Delivery Streamlining Initiative, USDA Farm Bill Programs, and value added Soil Survey products

• A process resulting in correlation of similar map units taking into account existing field and laboratory data, and expert knowledge

• Improve and complete the population of the soil properties database

• Reduce the number of map units for same and similarly named soil map units

• Identify priority additional update needs based on SDJR activities (Phases 2→X)

• Rectify the perceived interpretation discrepancies visible in geospatial presentation of soil survey information, and

• Build the foundation for next generation of soil survey – disaggregation and new farm and environmental interpretations (Phases 2→X)

Preview of Phase 2

What would the “disaggregated” soil map look like?

To achieve this future desired product, a process of disaggregating the existing spatial product to represent the probable location of individual soil components based on soil-landscape characteristics is needed.

The foundation for the disaggregation step is a harmonized soils database representing landscape specific, consistent map unit composition and improved soil scientific data through the SDJR activities.

The current soils information and data (SSURGO) is a very useful product; however, additional products will be necessary to continue to serve the public needs. In regards to soil maps, a transition from the current vector depiction (polygons) of soil distribution to raster (pixel based) databases of soil and soil property distribution is desired because of its usability with other GIS data layers.
SDJR Time Frame

In Fiscal Year 2012, the Soil Science Division began a 5-year initiative designed to review the soil survey data and thereby develop a current and common standard. Analysis in 2011 identified over 700 million acres, or roughly 30% of the 2.3 billion acres in the U.S., that included same-named or similarly named map units used in multiple counties. The identified map units were those that would affect the greatest number of the agency customers. The 5-year initiative was coined as “Soil Data Join Recorrelation” (SDJR). SDJR focused on selecting a soil series and harmonizing those county-based map units that had the same map unit concept into a single MLRA map unit concept. This instruction dates back to November 21, 1967, when Soils Memorandum 67 directed the Division to focus on interstate coordination of properties and interpretations across MLRAs. As FY (Fiscal Year) 2015 ends, 470 million acres of the 700 million acre goal have been harmonized.

What SDJR Means to Wisconsin

For the past several years Soil Survey Offices in the East Central Glaciated Region (11) & West Central Glaciated Soil Survey Region (10) have focused their work on the Soil Data Join and Recorrelation (SDJR) National Initiative. The goal of this Initiative has been to increase the consistency of the Soil Survey Geographic database (SSURGO) across political boundaries. A summary of the affected areas in Wisconsin are presented below. FY2016 will be the last official year of the SDJR Initiative. After FY2016, MLRA projects will become the main focus of Soil Survey Offices.

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Updated Acres</th>
<th>Top 5 Soil Series Updated in Wisconsin</th>
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<tbody>
<tr>
<td>2013</td>
<td>753,896</td>
<td>Kewaunee, Manawa, Hochheim, Poygan, Chasburg</td>
</tr>
<tr>
<td>2014</td>
<td>4,270,173</td>
<td>Lupton, Plainfield, Newglarus, Withee, Loyal</td>
</tr>
<tr>
<td>2015</td>
<td>3,799,486</td>
<td>Magnor, Dorerton, Houghton, Newglarus, Palsgrove</td>
</tr>
</tbody>
</table>
Soil Loss Tolerance (T) Simplified

Soil loss tolerance is defined as the maximum rate of annual soil erosion (tons/acre/year) that will permit a high level of crop productivity to be obtained economically and sustainably.

- **T=1**: Decaying Rock/ Fract Rock
- **T=2**: Bedrock/ Broken Bedrock Fragments
- **T=3**: Rocks/ Upper Layer
- **T=4**: Abrupt Clay Increased/ Contrasting Textures
- **T=5**: Sand/ Carbonates

(Units in cm)

**HISTORY**

- **1960**: Guidelines for T were formulated after 15 years of discussion.
- **1961-1962**: At SCS Regional Workshops 5 ton/acre Max tolerance was set.
- **2003**: FSA requested a way to provide consistency for soil interps used in USDA programs.
- **2010**: Implementation plan to roll out the national consistent T's in 2009 & 2010.

The assigned T factor is not used in erosion prediction calculations like RUSLE2. It is a target value that is compared to the results of erosion prediction calculations to determine whether a management system is or is not meeting criteria for controlling erosion.
What is K Factor? The K Factor is an index which quantifies the relative susceptibility of the soil to sheet and rill erosion.

The K Factor equation is based on extensive field research conducted by the USDA, Agriculture Research Service and uses soil properties in the USDA Soil Survey Database.

K Factor is used in the RUSLE2 soil loss prediction equation. Values range from .02 for the least erodible soils to .64 for the most erodible.

Soil Properties used in K Factor:
- Texture
- Permeability
- Organic Matter
What Makes Soil More Erodible?

<table>
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<tr>
<th>Lowest</th>
<th>More erodible</th>
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<tbody>
<tr>
<td>Texture – proportion silt and very fine sand; sand</td>
<td></td>
</tr>
<tr>
<td>Soil structure</td>
<td></td>
</tr>
<tr>
<td>Organic Matter %</td>
<td></td>
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<tr>
<td>Permeability</td>
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</tbody>
</table>

Wisconsin mineral soils with the lowest erodibility have greater than 90% sand and those with the highest erodibility are primary silt and very fine sand.

Structure & Organic Matter, while important in the K factor equation, do not have consistent trends across K factors in Wisconsin.
The soil loss tolerance rate (T) is the maximum rate of annual soil loss that will permit crop productivity to be sustained economically and indefinitely on a given soil. Erosion is considered to be greater than T if either the water (sheet & rill) erosion or the wind erosion rate exceeds the soil loss tolerance rate.

Map only reflects soils where the T-factor changed during the 2014 to 2015 SSURGO update.

Visit the WI NRCS homepage at: www.wi.nrcs.usda.gov for more information on T and K Factors.
Wisconsin Soil K-factor Changes
SSURGO 2014 to 2015 Update

Soils vary in their susceptibility to erosion. The soil erodibility factor K is a measure of erodibility for a standard condition. The soil erodibility factor K represents both susceptibility of soil to erosion and the amount and rate of runoff, as measured under the standard unit plot condition. Fine textured soils high in clay have low K values because they are resistant to detachment. Coarse texture soils, such as sandy soils, have low K values because of low runoff even though these soils are easily detached. Medium textured soils, such as silt loam soils, have moderate K values because they are moderately susceptible to detachment and they produce moderate runoff. Soils having a high silt content are the most erodible of all soils because they are easily detached.

Visit the WI NRCS homepage at: www.wi.nrcs.usda.gov for more information on T and K Factors.

Map only reflects soils where the K-factor changed during the 2014 to 2015 SSURGO update
Soil Erosion Factors are the numbers used to calculate soil erosion rates. USDA and Cooperative Soil Survey partners conduct extensive research and field testing to make sure these Factors are scientifically accurate.

**T factor**: describes the amount of soil which can be eroded without significantly damaging the productive capacity of the soil.

**K factor**: Describes the inherent susceptibility of the soil to erosion.

**Erosion Sensitivity**: $ES = K \times LS / T$

Map reflects only soils with a slope greater than 6% and found on cropland.

**For more information:**
Contact NRCS at your local USDA Service Center.

Visit the WI NRCS homepage at: [www.wi.nrcs.usda.gov](http://www.wi.nrcs.usda.gov) for more information on T and K Factor.
What is the K Factor?

» The K Factor is an index which quantifies the relative susceptibility of the soil to sheet and rill erosion.

» K Factor is used in the RUSLE2 soil loss prediction equation. Values range from .02 for the least erodible soils to .64 for the most erodible.

» Soil properties affecting K Factor include texture, organic matter content, structure, infiltration, and permeability.

» K Factors are based on extensive field research conducted by the USDA, Agricultural Research Service.

What is the T Factor?

» The T Factor is the maximum amount of annual sheet and rill erosion that permits the fertility and productive capacity of the soil to be maintained indefinitely.

» T Factor values range from 1 ton per acre per year for the most fragile soils, to 5 tons per acre per year for soils that can sustain more erosion without losing significant productive potential.

» Soil properties affecting T Factor include texture, permeability, available water capacity, and depth to restrictive layers such as rock, clay or gravel.

» T Factors are based on over 80 years of research establishing rates of soil formation and the effects of erosion on soil productivity.

Why are updates to the Factors needed?

» Updates are needed to reflect the latest research findings.

» As new soil property data is collected and soils are mapped in greater detail, more accurate estimates of T and K Factors can be made.

» Improved guidelines for estimating T and K Factors have been developed based on current research. Updated Factors, using these guidelines, will be more accurate and consistent nationwide.

How will the changes affect compliance?

» The T and K Factors in effect when an NRCS approved Conservation Plan was developed will continue to be used until the Plan is significantly revised.

» When an existing NRCS approved Conservation Plan is significantly revised, or when a new Plan is developed, the updated T and K Factors will be used.

» Compliance with a Self-Certified Conservation System will be determined by using the T and K Factors in effect at the time of the review.

» The T and K Factors in RUSLE2 will be updated as new versions are released.

For more information contact your local USDA, NRCS Service Center or visit the Wisconsin NRCS website: www.wi.nrcs.usda.gov

What is changing?

» Some T and K Factors are changing now because the technical criteria used to calculate the Factors have been updated. The new Factors have a solid research and scientific grounding and will facilitate more effective conservation planning and resource protection.

NRCS is working with state and local partners to assess the policy and planning impacts of T and K Factor changes. Release of the updated Factors in Wisconsin is ongoing as data is updated.

What is the impact?

» A decrease in T Factor or an increase in K Factor may result in more limited conservation system options.

» T and K Factor changes have the most impact on sloping cropland. In Wisconsin, the changes may result in more limited conservation system options on about 4.9 million acres of sloping cropland.

» Large changes in T and K Factors have more impact than smaller changes.

» The most change will occur in the western Wisconsin counties, but significant impacts are expected on individual farms throughout Wisconsin. In some areas the changes will permit more conservation system options, rather than fewer.
How are the Factors calculated?

» T and K Factors are based on research by the NRCS, University partners, the Agricultural Research Service and others, which establishes how soil properties affect erosion. Factors are updated in response to improved soil property data and new research.

» T and K Factors will continue to be updated as new knowledge and research becomes available.

Why do the Factors sometimes change on the county line?

» Soil properties, even within the same soil series, usually vary somewhat from place to place. To summarize this variability in a practical way, past soil survey work in Wisconsin identified representative values for the soil properties of each soil series in each county. Updates provide seamless transitions across county lines.

» T and K Factors are calculated from the representative values for key soil properties, like percent sand or depth to rock. Different representative values for soil properties in adjacent counties sometimes results in different T or K Factors.

» Our knowledge is based on county level research and data, so it is not known precisely where on the landscape a change in representative soil property values occurs.

When the original data supported different T or K Factors in adjacent counties, the updates will adjust for the series so that things are uniform.

What are soil scientists doing now to improve the data?

» In Wisconsin, more than 15 NRCS soil scientists, and many Cooperative Soil Survey partners are working now to conduct new research and improve the soil mapping and property data to better meet user needs.

» Current soil survey work characterizes soil properties across broad natural landforms. Soil scientists identify patterns and natural breaks in soil property values, without concern for county boundaries. This process eliminates "no-joins" across county boundaries. Because work to improve the mapping and data requires significant time and resources, soil scientists are working with data users to ensure they efficiently address the highest priority needs first.

» Soil investigations concentrate on more fully and accurately characterizing soil properties to meet current needs. New technologies such as Ground Penetrating Radar, infrared photography, 3-D mapping software, and digital terrain models are used to validate and improve the soil mapping. New interpretations are developed to meet current needs.

For more information contact your local USDA, NRCS Service Center or visit the Wisconsin NRCS website www.wi.nrcs.usda.gov


**Background**

In accordance with Title 7 Code of Federal Regulations, Chapter VI, Subchapter B — Conservation Operations, Part 610.4—Technical Assistance Furnished, the Natural Resources Conservation Service (NRCS) provides technical assistance to those who are responsible for making decisions and setting policies that influence land use, conservation treatment, and resource management. This technical assistance consists of assistance with programs, planning, application of conservation practices, and in the technical phases of USDA cost-share programs.

These authorities define the Soil Science Division mission as:

1. Make an inventory of the soil resources of the United States
2. Keep the inventory current to meet contemporary needs
3. Interpret the information and make it available in a useful form
4. Provide technical assistance and promote the use of soil survey for a wide range of community planning and resource development issues to both non-farm and farm uses.

The emphasis of this business plan is Mission Objective 4.

**Major TSS Task Areas**

The performance of TSS requires skills in a variety of activities. In alignment with the mission objectives of the SSD, the primary TSS task goals fall into four basic categories, listed below. Knowledge and skill levels for each task can easily be assessed for training needs and also listed in performance plans for each provider by his/her supervisor:

1. Providing TSS consultations
2. Development and execution of TSS plans/projects with cooperator community
3. Outreach and education
4. Improvement of existing data for TSS and planning needs

Numerous TSS tasks are related to each category and can be enumerated and accounted for during the course of the fiscal year, allowing for more accurate and timely allocation of funding from various financial pools. Using the model of alignment of tasks with major responsibility areas also allows for delegation of various tasks to specialty team member who have suitable skills and experience for the tasks. Mid- to long-term cross-training plans can then be more readily developed with SMART goals to incorporate into individual performance plans. The following tasks fall within the assigned categories, following guidance from the National Soil Survey Center and National Headquarters.

**Providing TSS Consultations**

1. Wetland delineations/determinations/compliance/appeals
2. Highly Erodible Lands (HEL) determinations/compliance/appeals
3. Important Agricultural Lands (IAL) and Farmlands evaluations
4. Site specific soil investigations
5. Farmland Protection Policy Act (FPPA)
6. Provide guidance on Web Soil Survey / SoilWeb for external customers
7. Provide Geographic Information System (GIS) support materials (maps, analyses)

**Development and Execution of TSS Plans/Projects with Cooperator Community**

1. Lead/organize or participate in annual meeting of cooperator community to identify TSS needs for region
2. Develop or carry out assigned activities in annual work plan for TSS tasks
3. Lead or participate in writing up annual report on TSS activities to be provided to cooperator community at the annual meeting

**Outreach and Education**

1. Provide training for conservation planners on soils information and TSS activities
2. Provide support for local school conservation and environmental activities (Envirothon, Land Judging contests, etc.)
3. Receive/provide training on relevant subject matter related to TSS activities, e.g., hydric soils, wetland delineation, FPPA, NRI (National Resource Inventory)
Outreach and Education (continued)

4. Interact with other Federal, State, Local, and/or non-governmental agencies to inform about NRCS TSS activities and materials

5. Lead development of / provide current materials for technical publications released by state and local offices, in accordance with review standards of the agency

Improvement of Existing Data for TSS and Planning Needs

1. Lead/participate in NRI data collection and analyses

2. Assist with ecological sites data collection and analyses; review and critique of descriptions

3. Review conservation practices and providing input on job sheet development

4. Help with maintenance of eFOTG as requested

5. Assist with updates for local surveys, as requested by MLRA Regional Office

6. Develop/improve existing soil interpretations to include Wisconsin criteria

7. Lead/participate in special studies of soil characteristics that augment information for soil health and qualities for TSS consultation

8. Annual refresh of all soil survey data from Wisconsin to the Soil Data Warehouse, including transfer of appropriate access database to all field offices

9. Develop/improve soil criteria used in ranking applications for Farm Bill programs

10. Inform MLRA update projects through on-site investigation findings showing discrepancies with current soil survey information

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<th>TECHNICAL ASSISTANCE</th>
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<td>CTA-GENRL: Conservation Technical Assistance – General</td>
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<tr>
<td>Wetland delineations/determinations/compliance/appeals</td>
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<td>HEL/determinations/compliance/appeals</td>
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<tr>
<td>Resource inventories for conservation planning</td>
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<tr>
<td>Site-specific soil investigations</td>
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<tr>
<td>Outreach (preparing/presenting informational or technical materials, Envirothon, Land Judging)</td>
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<tr>
<td>Farmland Policy Protection Act, LESA</td>
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<tr>
<td>GIS (creating maps, performing analyses)</td>
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<td>Hydric soils list</td>
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<td>Important Farmlands list</td>
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<tr>
<td>Ecological Sites – data collection and analyses; review descriptions</td>
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<tr>
<td>Soil technology development/maintenance</td>
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<td>Quality Assurance Reviews (Area/Field Offices)</td>
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<td>Developing workload analysis and business plans</td>
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<td>Providing soils information to internal and external customers</td>
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<td>Reviewing conservation practice standards</td>
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<td>Receiving and presenting training</td>
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<td>Maintain eFOTG</td>
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<tr>
<td>Liaison to other Federal, State, Local, or non-governmental agencies</td>
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<tr>
<td>Program Management and Support (preparing reports, drafting bulletins, supervision, performance plans and reviews, recruiting/hiring)</td>
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<tr>
<td>CTA-NRI: Conservation Technical Assistance – National Resources Inventory</td>
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<td>-------------------------------------------------------------</td>
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<tr>
<td>Data collection and analyses</td>
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<tr>
<td>Product publications (fact sheets, summary reports)</td>
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<td>Program Management and Support</td>
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<td><strong>SOIL: Soil Survey</strong></td>
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<tr>
<td>Soil survey – initial (mapping, database, compilation, field reviews)</td>
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<tr>
<td>Soil survey – update and maintenance (transects, database, spatial data edits, reviews)</td>
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<tr>
<td>Special studies (carbon, soil quality, other characterization studies)</td>
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<tr>
<td>Soil interpretations development</td>
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<tr>
<td>Maintaining soil databases for Planning and Programs (RUSLE2, initiatives)</td>
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<tr>
<td>GIS (creating maps, performing analyses)</td>
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<tr>
<td>Program Mgt and Support (organizing annual work planning conference, developing business plan, reviewing/approving MLRA Soil Survey Office projects)</td>
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<tr>
<td><strong>FARM BILL PROGRAMS</strong></td>
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<tr>
<td><strong>EQIP: Environmental Quality Incentive Program; WHIP: Wildlife Habitat Incentive Program; CSP: Conservation Security/Stewardship Program; CRP: Conservation Reserve Program</strong></td>
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<tr>
<td>Site-specific soil investigations</td>
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<tr>
<td>Developing soil criteria to use in ranking applications</td>
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<tr>
<td>GIS (creating maps, performing analyses)</td>
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<tr>
<td>Ecological Sites – data collection and analyses; review descriptions</td>
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<td>Review and update soil rental rates</td>
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<td><strong>EASEMENT PROGRAMS</strong></td>
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<tr>
<td><strong>FRPP: Farm and Ranch Lands Protection Program; WRP: Wetlands Reserve Program; GRP: Grasslands Reserve Program; HFRP: Healthy Forests Reserve Program</strong></td>
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<tr>
<td>Important farmlands identification</td>
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<td>HEL and wetland compliance</td>
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<tr>
<td>GIS/GPS (creating maps, performing analyses, verifying easement boundaries)</td>
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</table>

(Source: PIA_TSS_FY2014_business_plan.pdf)
Wisconsin continues to improve soils data and products to meet the current and emerging resource concerns.

**Request Type**

- Interpretation Development: 9.68%
- Technical consultation: 4.59%
- Presentation: 8.56%
- Offsite determination: 12.83%
- On-Site Investigation: 60.93%
- Other: 3.41%

**Explanation**

A surge in onsite wetland determinations was due to the Farm Bill relinking highly erodible land conservation and wetland conservation compliance with eligibility for premium support paid under the federal crop insurance program.

**Number of Technical Soil Services Incidences**

In 2015, Wisconsin also ranked 4th in the Nation for the number of Technical Soil Services Requests.
Within NRCS, Technical Soil Services provided by the soil scientists span and assist the agency’s operations from national headquarters to the county-based conservation field office. A key role of the soil scientist is to provide tailored, accurate information for site-specific planning.

**Wetland Determinations**

Wisconsin had the 4th highest workload in the Nation related to conservation compliance.

At 131% of last year's numbers!

<table>
<thead>
<tr>
<th>Year</th>
<th>Numbers</th>
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<tr>
<td>2014</td>
<td>2,220</td>
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<tr>
<td>2015</td>
<td>2,900</td>
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“Reliable interpretations can result only from a synthesis of basic data about the soils themselves, obtained from field and laboratory research, data from field experiments, and the experience of users of soils, especially farmers, ranchers, foresters, and engineers.” – Charles Kellogg.
• Promote the soil survey and provide technical assistance in its use for a wide range of community planning and resource development issues related to non-farm and farm uses.

Why do we do these things called “Soil Survey Interpretations”?

How are they related to the soil survey program as a whole? Soil interpretation began to be recognized as an integral part of soil survey about 1930. Soil scientists had varying abilities in capturing and transferring the experience of land users. Early soil surveys were thematic maps “where will tobacco grow”, for example. Later it was decided that mapping soils as suites of properties is a better deal, because that allows us to make new interpretations form the same data.

Define a “Soil Property”

• Attributes of soils or sites that are or can be directly measured
• They may be dynamic (temporal or changeable) conditions.
• Attributes such as reaction, cation exchange capacity, content of clay, shape of the landform, parent material and so on

Soil Property vs Soil Interpretation

• **Soil Interpretations** are Texture, K-Factor, Septic Tank Adsorption fields
• **Soil Properties** are Sand, Silt, Clay, KSAT

(Source: Bob Dobos, National Soil Survey Center)

Needed Wisconsin Interpretations from Partners

• Wisconsin Commodity Crop Index for Corn
• Forage Suitability Groups
• Forested Biomass Harvesting
• Biomass Waste Application Interpretations
• Industrial Waste Water and By-Product Solids
• Industrial Sludge
• Municipal Bio-solids
• Seepage, Holding Tank and Grease Traps
• Conventional On-Site Septic Systems
• Geothermal Installation
• Potential Ginseng Production
• Potential Hop Production – Commercial Soil and Site Suitability – (Non-irrigated)
## SPECIALIZED SOIL DATA ACCESS SCRIPTS

<table>
<thead>
<tr>
<th>Count</th>
<th>Lookup from County, Soil Map Unit Symbol</th>
<th>How it is used</th>
<th>Source of information for 2014 update</th>
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<td>Soil series name, texture</td>
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<td>Extracted from RUSLE2 soils databases, downloaded from the RUSLE2 web site</td>
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<td>Default slope, slope length</td>
<td>Used for erosion and P Index calculations, winter manure application restrictions</td>
<td>RUSLE2 soils databases, same as above</td>
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<td>3</td>
<td>T (Tolerable soil loss)</td>
<td>Check against calculated soil loss</td>
<td>RUSLE2 soils databases, same as above</td>
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<td>4</td>
<td>Soil based restrictions for S90 (r,w,p, +)</td>
<td>Checking applications to make sure they are within S90.</td>
<td>Soil Data Access</td>
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<td>5</td>
<td>Soil group (sandy, loamy, organic)</td>
<td>Crop nutrient recommendations</td>
<td>A2809 Soil Group lists (defined by Carrie Laboski from SSURGO data)</td>
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<td>6</td>
<td>Corn yield potential (sandy, medium, high)</td>
<td>Corn N recommendations</td>
<td>A2809 Yield Potential Lists (defined by C. Laboski as above)</td>
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<td>7</td>
<td>Drainage class, Available water Capacity, Bedrock depth, Soil Temp Regime</td>
<td>Checking limitations on corn yield potential that may be overcome by irrigation or drainage</td>
<td>SSURGO</td>
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<td>Subsoil Fertility Group Factors (A,B, C, D, E,)</td>
<td>P Index</td>
<td>Old A2809 (by soil series), new series are assigned to a group by Laura Good (note; these factors will no longer be used within about 2 years)</td>
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<tr>
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<td>NR243 w soils</td>
<td>Listed with restrictions for CAFO plans</td>
<td>CAFO restriction map layer data</td>
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<td>10</td>
<td>NRCS soil-based yield potential for key crops</td>
<td>Assign yields for RUSLE2 erosion calculations</td>
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<td>11</td>
<td>Erodibility Index</td>
<td>To select most erodible soil map unit in field</td>
<td>Calculated by from K (erodibility), Slope, slope length, T</td>
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<td>12</td>
<td>Lateral Effects</td>
<td>The lateral effect distance is the distance on either side of a ditch or tile over which the water in the soil is affected by the presence of the ditch or tile within a given period of time and is effectively drained</td>
<td>NRCS/DNR (SSURGO)</td>
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Estimated Technical Soil Service Hours by State
(Wisconsin is one of the top two)

NEW Soil Data Viewer Alternative!

The SSURGO OnDemand Dynamic Spatial Interpretations Tool can process soils data from large geographic areas rapidly and is a one-stop shop for any number of soil survey areas at once for any and all interpretations or properties. It accesses authoritative soils data without the need for downloading external tabular data sets. Please direct questions and comments to Chad Ferguson at charles.ferguson@nc.usda.gov or Jason Nemecek at jason.nemecek@wi.usda.gov.

Two attachments are available online at www.nrcs.usda.gov/wps/portal/nrcs/main/wi/soils/
- Python scripts and ArcGIS SSURGO OnDemand toolbox (48 KB ZIP)
- SSURGO OnDemand Dynamic Spatial Interpretations Tool (documentation and instructions) (215 KB)
WI NRCS
Number of Wetland Determinations by County FY 15

FY15 Wetland Determinations
1 - 13
14 - 40
41 - 74
75 - 117
118 - 211
The Web Soil Survey (WSS) provides agricultural producers, agencies, Technical Service Providers, and others electronic access to relevant soil and related information needed to make land-use and land management decisions.

**Web Soil Survey provides a simple yet powerful way to analyze soil data in three basic steps.**

Starting Web Soil Survey
- Open the NCSS WSS site at http://websoilsurvey.nrcs.usda.gov
- Click the “Start WSS” button to begin

Step 1
**Define Your Area of Interest (AOI)**
- Under “Navigate By...,” click on “Address” or “County” to view your area of interest (other navigation options are also available).
- Click the Zoom tool (plus sign) and drag a box to zoom in on a specific area. Repeat as necessary.
- Click the rectangular AOI tool to drag a box or use the polygon AOI tool to click around your specific area of interest.

Step 2
**View and Explore Your Soil Map**
- Click on the “Soil Map” tab
- View your soil map by clicking “View All” button
- To redefine the soil map location, click on the “Area of Interest” tab and click the “Clear AOI” button and redraw area of interest.
- Click the “View” button
- Click on Soil Data Explorer for checking soil suitabilities and limitations or soil properties.
- Interpretive maps will be produced with your specific inquiry.
- The items that you want saved can be added to a customized report in your shopping cart. Add a custom report of soils information in your AOI by clicking on the “Add to Shopping Cart” button

http://websoilsurvey.nrcs.usda.gov
Wisconsin Area GIS Specialists

**NW Area**
Alex Dvoracek  
715-832-6547  x126  
alex.dvoracek@wi.usda.gov

**NE Area**
Duane DeVerney  
920-733-1575  x124  
duane.deverney@wi.usda.gov

**SW Area**
Craig Surman  
608-647-8874  x131  
craig.surman@wi.usda.gov

**State Office**
Kent Peña, State GIS Coordinator  
608-642-4422  x274  
kent.pena@wi.usda.gov

**SE Area**
Kevin Lamken  
920-386-9999  x109  
kevin.lamken@wi.usda.gov

USDA is an equal opportunity provider and employer.
NRCS divides the United States into Major Land Resource Areas (MLRAs). An MLRA consists of a set of geographically associated land resource units featuring a particular pattern of soils, water, climate, vegetation, land use, and type of farming.
MLRA 110
Northern Illinois and Indiana Heavy Till Plain
Acres: 5,233,195
Square Miles: 8,177
### Major Land Resource Areas

**MLRA 90A**  
Wisconsin and Minnesota Thin Loess and Till, Northern Part  
Acres: 3,462,351  
Square Miles: 5,410

**MLRA 91B**  
Wisconsin and Minnesota Sandy Outwash  
Acres: 2,286,969  
Square Miles: 3,573

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**MLRA 90B**  
Superior Lake Plain  
Acres: 1,792,501  
Square Miles: 2,801
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</table>

**Rhinelander Major Land Resource Area**

**Soil Survey Office Region**

**MLRA 90A**
Wisconsin and Minnesota Thin Loess and Till, Northern Part
Acres: 7,719,563
Square Miles: 12,062

**MLRA 90B**
Wisconsin and Minnesota Thin Loess and Till, Southern Part
Acres: 4,051,063
Square Miles: 6,330

**MLRA 93B**
Superior Stony and Rocky Loamy Plains and Hills, Eastern Part
Acres: 4,209,132
Square Miles: 6,577

**MLRA 94B**
Michigan Eastern Upper Peninsula Sandy Drift
Acres: 6,098,112
Square Miles: 9,528

**MLRA 94D**
Northern Highland Sandy Drift
Acres: 1,347,830
Square Miles: 2,106
Waverly Major Land Resource Area
Soil Survey Office Region

MLRA 104
Eastern Iowa and Minnesota Till Prairies
Acres: 7,693,689
Square Miles: 12,021
Major Land Resource Areas

Juneau Major Land Resource Area
Soil Survey Office Region

MLRA 95A Northeastern Wisconsin Drift Plain
Acres: 4,127,214.97
Square Miles: 6,448.77

MLRA 95B Southern Wisconsin and Northern Illinois Drift Plain
Acres: 7123,976.90
Square Miles: 11,131.21

FIPS County State MLRA Acres
007 Boone IL 180,458
031 Cook IL 5,585
037 Dekalb IL 139,074
089 Kane IL 211,411
097 Lake IL 43,525
111 McHenry IL 390,862
141 Ogle IL 41,187
177 Stephenson IL 178,483
201 Winnebago IL 285,439
041 Delta MI 91,178
103 Marquette MI 2,619
109 Menominee MI 358,638
001 Adams WI 59,587
009 Brown WI 342,098
015 Calumet WI 253,860
021 Columbia WI 503,064
025 Dane WI 598,047
027 Dodge WI 580,381
029 Door WI 312,728
039 Fond du Lac WI 489,805
045 Green WI 227,012
047 Green Lake WI 243,343
055 Jefferson WI 372,838
059 Kenosha WI 43,382
061 Kewaunee WI 219,967
071 Manitowoc WI 380,712
075 Marinette WI 211,636
077 Marquette WI 297,622
078 Menominee WI 5,724
079 Milwaukee WI 11,304
083 Oconto WI 315,352
087 Outagamie WI 412,366
089 Ozaukee WI 129,888
097 Portage WI 117,335
101 Racine WI 50,696
105 Rock WI 464,630
111 Sauk WI 73,630
115 Shawano WI 291,135
117 Sheboygan WI 331,024
127 Walworth WI 368,734
131 Washington WI 271,137
133 Waukesha WI 306,437
135 Waupaca WI 306,338
137 Waushara WI 367,130
139 Winnebago WI 370,394

Total Acres: 11,251,191.87
Total Sq. Miles: 17,579.98
Onalaska Major Land Resource Area
Soil Survey Office Region 10-10

Total Acres: 14,654,975
Total Sq. Miles: 22,898

MLRA 89: Wisconsin Central Sands
Acres: 2,239,689
Square Miles: 3,500

MLRA 105: Northern Mississippi Valley Loess Hills
Acres: 12,415,285
Square Miles: 19,399
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