An aerial photograph of a large, winding river or lake system. The water is a light blue-grey color. The surrounding land is a mix of green fields, dense forests, and some residential or commercial buildings. A long bridge with many piers spans across the river in the lower right portion of the image. The sky is a clear, pale blue.

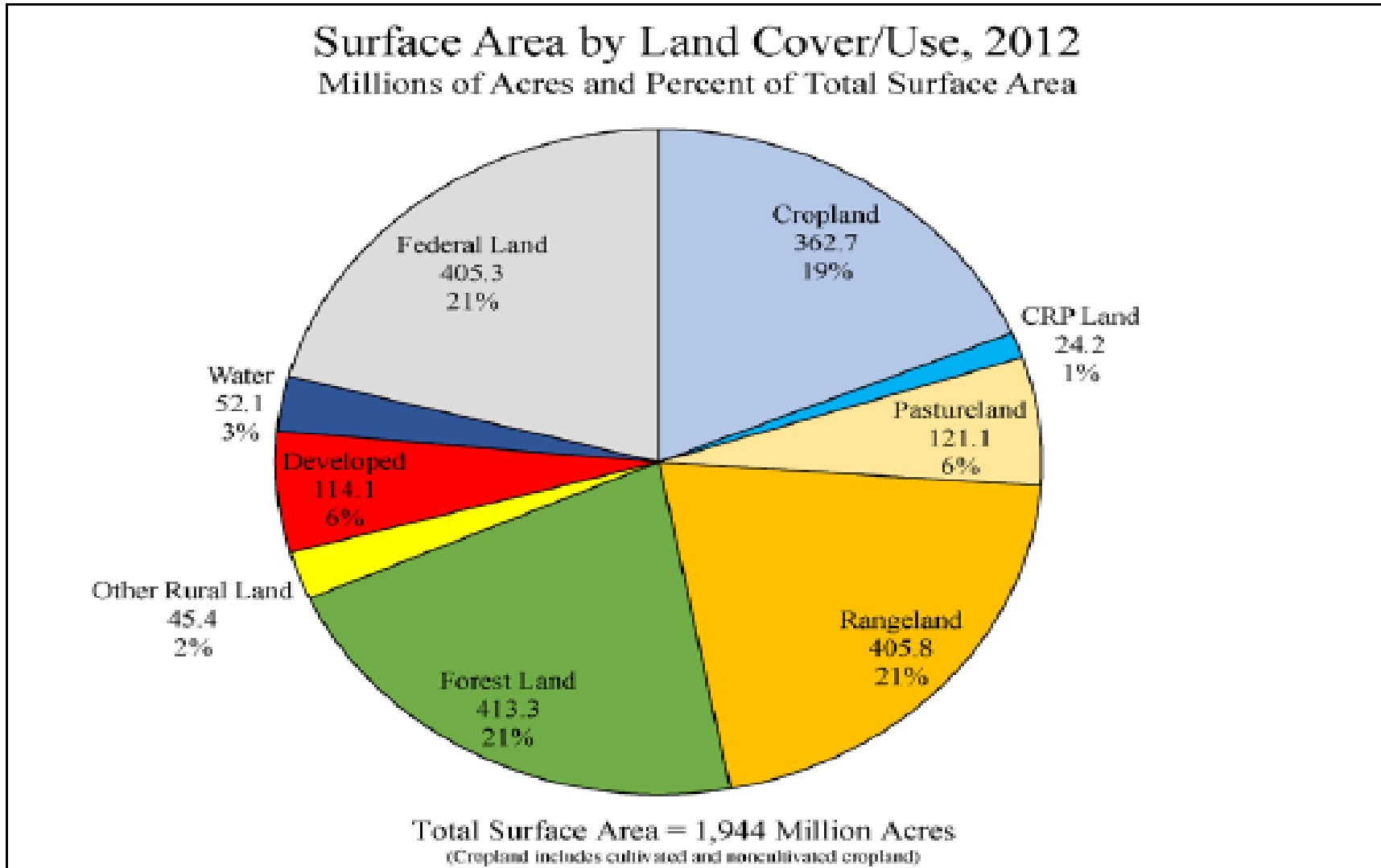
Wisconsin Nutrient Management where food, land, and water meet

Sue Porter WDATCP

How much of the US is cropland?
What is our largest surface water pollutant?
What is our largest groundwater pollutant?

USDA National Resources Inventory - 2012 data pub. August 2015

Broad Land Cover of the contiguous 48 states, Hawaii, Puerto Rico, and the US Virgin Islands cover over 1.94 billion acres of land and water. About 71% of this area is non-Federal rural land – 1.4 billion acres. Non-Federal rural lands are predominately forest land (413 million acres), rangeland (406 million acres), and **CROPLAND** 363 million acres = 19%.



Differences in Tilled and No Till Soils



WI Agricultural Water Quality Performance Standards

NR151 & ATCP 50 Wis. Admin. Codes

NR 151 Performance Standards

- Meet T for fields and pastures
- Follow 590 NM plan
- Follow a 5' to 20' tillage setback from water
- Prevent direct runoff: feedlots, feed, waste water, or manure storage to waters
- Limit livestock access waters to maintain banks
- Follow manure storage technical stds. when constructing/ abandoning. Maintain to prevent leaking or overflow.

Near surface water or areas susceptible to groundwater contamination

- Do not stack manure in an unconfined pile
- Divert clean water away from barnyards, feedlots, and manure storage

ATCP 50 conservation practices

Describes how farms need NM plan when offered cost share \$ or without cost share if:

1. Participating in the **Farmland Preservation**
2. Regulated by **DNR WPDES** permit or **local ordinance** manure storage or livestock siting
3. Accepting manure storage cost share
4. Causing a significant **discharge**

Exceeding state standards ATCP 50.04 is only allowed if approved by either DATCP or DNR. A local governmental unit is responsible for analyzing the legal adequacy of its regulations.

What's in a 590 Nutrient Management Plan?

- Follows USDA NRCS WI **590** Standard and UWEX Pub. **A2809** *Nutrient application guidelines for field, vegetable, and fruit crops in Wisconsin* **to protect farm profitability, water, and soil** with nutrient application requirements
- Accounts for **ALL** N-P-K nutrient applications for the crop rotation **showing adequate acreage for manure**
 - nutrients shall not run off the field during or immediately after application
 - **Annually** update of changes to last year's planned crops, yield ranges, nutrients, and tillage refining current and future crop needs
- Soil test sample every 5 acres every 4 years using a DATCP certified lab.

**Soil test – nutrient credits
= fertilizer to apply**

DATCP Certified Soil Testing Laboratories

1. A&L Great Lakes, Fort Wayne IN
2. AgSource, Bonduel WI
3. Dairyland, Arcadia WI
4. MVTL, New Ulm MN
5. Midwest Laboratories, Omaha, NE
6. Rock River, Watertown WI
7. UW-Madison Soil & Forage Analysis, Marshfield WI

All these labs are Manure Analysis Proficiency program participants

Nutrient Management – Septage & Biosolids



ATCP 65.22(6)(c) There shall be no mixing or storage of human waste or septage with animal manure on a dairy farm.

- Preventing typhoid fever, dysentery, and other infections from being carried from excreta to the milk.

ATCP 50.04(3) explains how NM is conducted in WI.

- The plan shall be consistent with any NM plan required under ch. NR 113, 204, or 214 if the landowner applies septage, municipal sludge, industrial waste, or industrial by-products to the land and in accordance with s. ATCP 65.22(6)(c). A landowner is not required to have a NM plan under this subsection if the landowner applies primarily septage, municipal sludge, industrial waste, or industrial byproducts according to ch. NR 113, 204, or 214.
- Follow the NRCS 2015-590 Standard.

Follow the NRCS 2015-590 Standard

- IV.A.1. m. Organic by-products other than manure shall be analyzed for total N, ammonium N, total P, total K, and solids content and applied to fields in accordance with this standard and any applicable regulations including restrictions on heavy metal content, mandatory separation distances and land application rates.
- VI. Plans and Specifications D. Industrial wastes, municipal sludge and some organic by-products are regulated by the Wisconsin Department of Natural Resources (WDNR). They must be spread in accordance with a Wisconsin Pollution Discharge Elimination System (WPDES) permit as obtained from the WDNR and also in accordance with IV.A.1.m.

ATCP 50 Admin. Code Changes

1. Replacing 2005 Nutrient Management (NM) 590 Standard with 2015-590 NM Std. Increases cost share from \$7 to \$10/ac X 4 years = \$28/ac to \$40/ac.
2. Clarifies when applying manure or organic by-products the phosphorus (P) strategy alternative to the *P INDEX ≤ 6 performance standard* is managing **SOIL TEST** *P balance when 50-100, draw down when is >100 PPM* consistent with 2005 and 2015-590 NM Stds.
3. Requires NM planners to follow ATCP 50.04(3). Complete a NM plan Checklist, substantiate responses, and provide to DATCP or DATCP's agent if requested.
4. Clarifies the standards for **cost-sharing**, specifically that a **manure storage** system's capacity is based on the farm's inability to comply with the NM plan. When the facility is emptied, the manure must be applied to non-frozen soil in compliance with a NM plan under s. ATCP 50.04(3).
5. Clarifies that a local manure storage **ordinance** may include provisions to monitor the adequacy of manure storage systems including the annual submission of a NM plan that complies with ATCP 50.04(3).
6. Prevents a conflict of interest for a privately owned DATCP certified soil testing laboratory to not perform soil test analysis in-house on cropland managed or owned by a person managing or having a substantial financial interest in the laboratory.



2015-590 Changes Surface water and groundwater protection



- No applications within 50' of direct conduits to groundwater unless deposited by gleaning or pasturing animals or as corn starter fertilizer.



- Do not apply to areas locally delineated by the Land Conservation Committee or in a conservation plan as areas contributing runoff to direct conduits to groundwater unless manure is substantially buried within 24 hours
- New: Provides methods for rescue N applications and refining NM recommendations through on-farm research using 590's Technical Note Appendix 3, Guidelines for Adaptive Nutrient Management
- New: Do not apply to areas near public water supplies unless manure is treated to substantially eliminate pathogens. Area within:
1000' of a *Community potable water well - Municipal*; or
100' of a *Non-community potable water well – Public* (church, school, restaurant...)

590 criteria for surface water protection

Nutrients Applied In **Surface Water Quality Management Area**

(**SWQMA**) 1000' from ponds or lakes and
300' from rivers or streams

In fall, spring, summer use 1 or more of the following:

- Effective incorporation within 72 hours of application
- Establish crops prior to, at, or promptly following application
- Install/maintain vegetative buffers or filter strips
- Maintain $\geq 30\%$ cover after nutrient application
- Apply nutrients within 7 days of planting on fields with $< 30\%$ cover and have 3 or more consecutive years of no-till *example corn silage*
- In the **SWQMA** or where subsurface drainage is present limit mechanical applications of unincorporated liquid manure with 11.0% or less dry matter to 12,000 gals/acre. Sequential applications may be made to meet the nutrient need waiting at least 7 days between applications. Visually monitor accessible tile outlets before, during, and after applications for discharge of liquid manure or organic by-product. If a discharge is observed, stop applications.

Winter - when temperature/snow prevents effective incorporation:

- Do not **mechanically** apply nutrients within the **SWQMA**; but gleaning or **pasturing** animals are allowed in **SWQMA** and on all slopes in winter while following 590.





590 Protecting surface and ground water

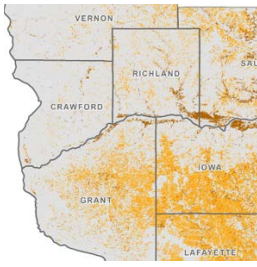
Winter, when temperature or snow prevents effective incorporation:

No commercial N or P fertilizer application except on pastures and winter grains.

New:

- Farms mechanically applying manure or organic by-products must have a Winter Spreading Plan: amount available storage, winter applied, or generated in 14 days, whichever is greater.
- Do not exceed the P removal of the following growing season's crop. Limit liquid manure applications to 7,000 gal/acre. All winter manure applications 60 lbs. of P₂O₅/ac or less.
- Do not apply within **300 feet** of direct conduits to groundwater.
- Do not surface apply **liquid manure during February and March** on:
 - **DNR Well Compensation** areas funds provided to replace wells when contaminated with livestock manure or
 - **Silurian dolomite within 5 feet** of soils surface.
- Do not apply **where concentrated flow channels are present** (options 1.- 7.) or on **slopes > 6%** (options 1.- 5.) unless 2 practices are used:
 1. **Contour buffer strips or contour strip cropping**
 2. **Leave all crop residue and no fall tillage**
 3. **Apply manure in intermittent strips on no more than 50% of field**
 4. **Apply manure on no more than 25% of the field during each application waiting a minimum of 14 days between applications**
 5. **Reduce manure app. rate to 3,500 gal. or 30 lbs. P₂O₅, whichever is less**
 6. **No manure application within 200 feet of all concentrated flow channels**
 7. **Fall tillage is on the contour and slopes are lower than 6%**





590 criteria for groundwater protection

New: Nitrogen (N) restricted soils limit N applications to A2809 and these 590 rates for all N sources to reduce leaching.

Late summer or fall **commercial N fertilizer rates** on fall seeded crops or commercial fertilizers **blends** needed, Pub. A2809. Do not exceed **36 lbs. N/ac.** on these features:

(P) high permeability soils Use 1 of **Split, Slow-release, NO3 inhibitor** to reduce **spring** leaching

(R) rock soils with less than 20 inches to bedrock

(W) wet soils with less than 12 inches to apparent water table

Soil depth 5 feet or less over bedrock

Within 1,000 feet of a community well



Late summer or fall **manure or organic by-products rate limits** do not smother crops:

Use ≤ 120 lbs. available N/acre

P & R soils on all crops, except annual crops.

Additionally, manure with ≤ 4% DM wait until after soil temp. < 50°F or Oct. 1 use either a nitrification inhibitor or leave on surface for 3 days.

W soils or combination W soils on all crops.

Additionally, manure with ≤ 4% DM on all crops use at least 1 of 5 practices:

1. Use nitrification inhibitor.
2. Apply on an established cover crop, an overwintering annual, or perennial crop.
3. Establish a cover crop within 14 days of application.
4. Surface apply and do not incorporate for at least 3 days.
5. Wait until after soil temp. < 50°F or Oct. 1.

Use ≤ 90 lbs. available N/acre

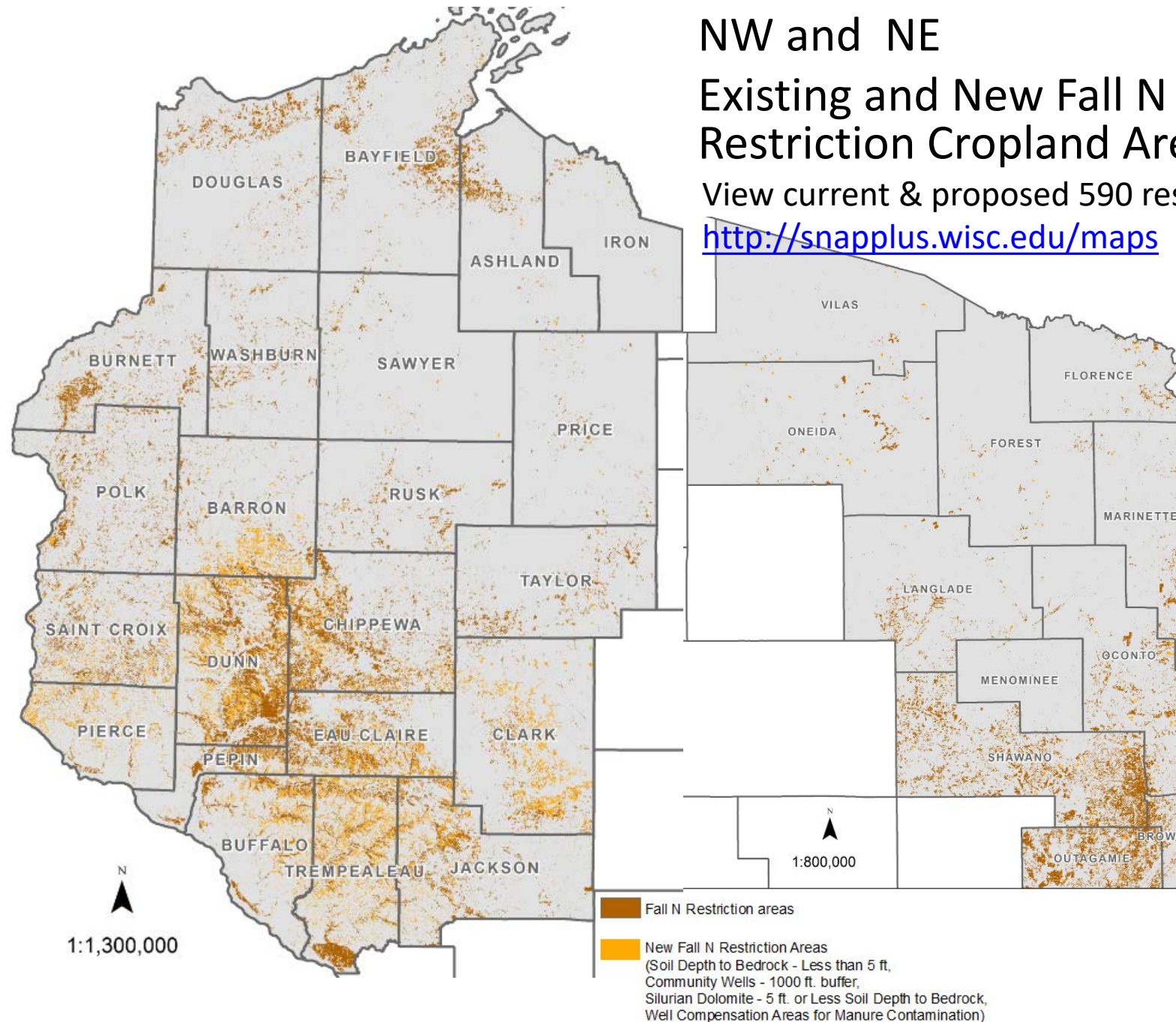
P & R soils wait until after soil temp. < 50°F or Oct. 1 **on annual crops.**

Additionally, manure with ≤ 4% DM on all crops use either a nitrification inhibitor or leave on surface for 3 days.

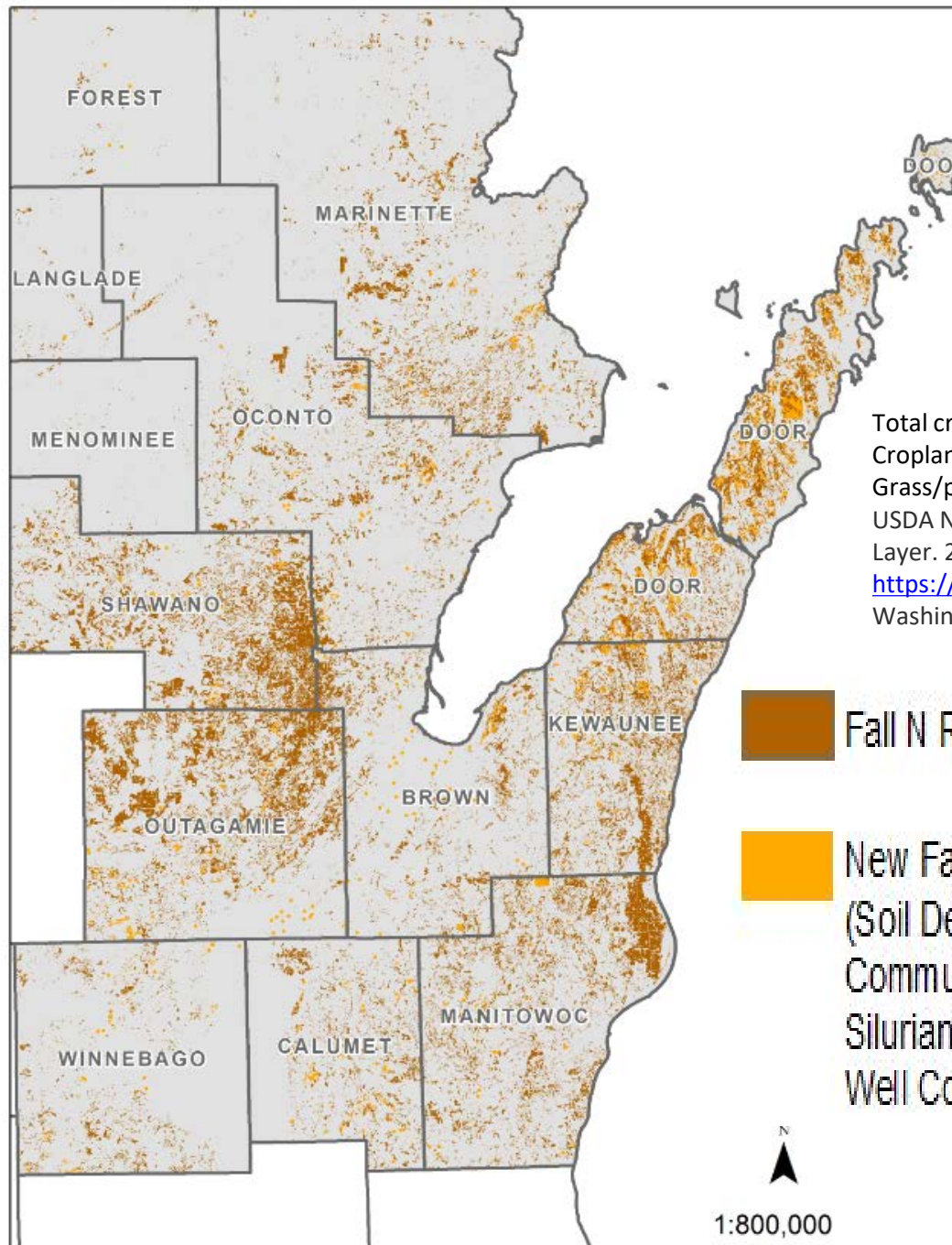
W soils or combination W soils ≤ 4% DM on all crops.

NW and NE Existing and New Fall N Restriction Cropland Areas

View current & proposed 590 restrictions at
<http://snapplus.wisc.edu/maps>



Total cropland in WI (11,866,674 acres). Cropland Data Layer as the source of cropland acreage data. Grass/pasture was include in the cropland total. USDA National Agricultural Statistics Service Cropland Data Layer. 2015. Published crop-specific data layer. Available at <https://nassgeodata.gmu.edu/CropScape/> USDA-NASS, Washington, DC.

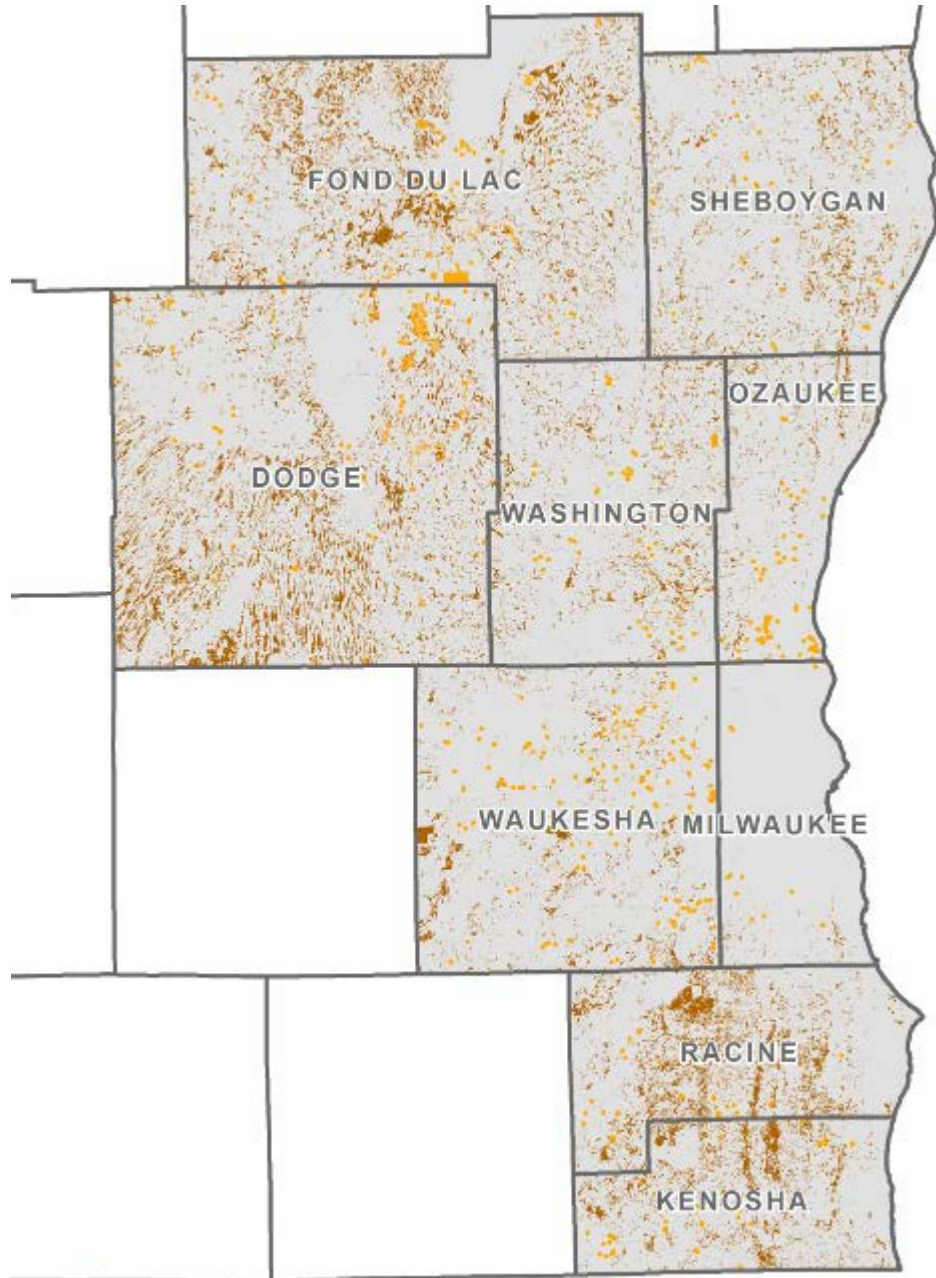


NE Existing and New Fall N Restriction Cropland Areas

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 Washington, DC.

- Fall N Restriction areas
- New Fall N Restriction Areas
 (Soil Depth to Bedrock - Less than 5 ft,
 Community Wells - 1000 ft. buffer,
 Silurian Dolomite - 5 ft. or Less Soil Depth to Bedrock,
 Well Compensation Areas for Manure Contamination)

N
▲
1:800,000



SE Existing and New Fall N Restriction Cropland Areas

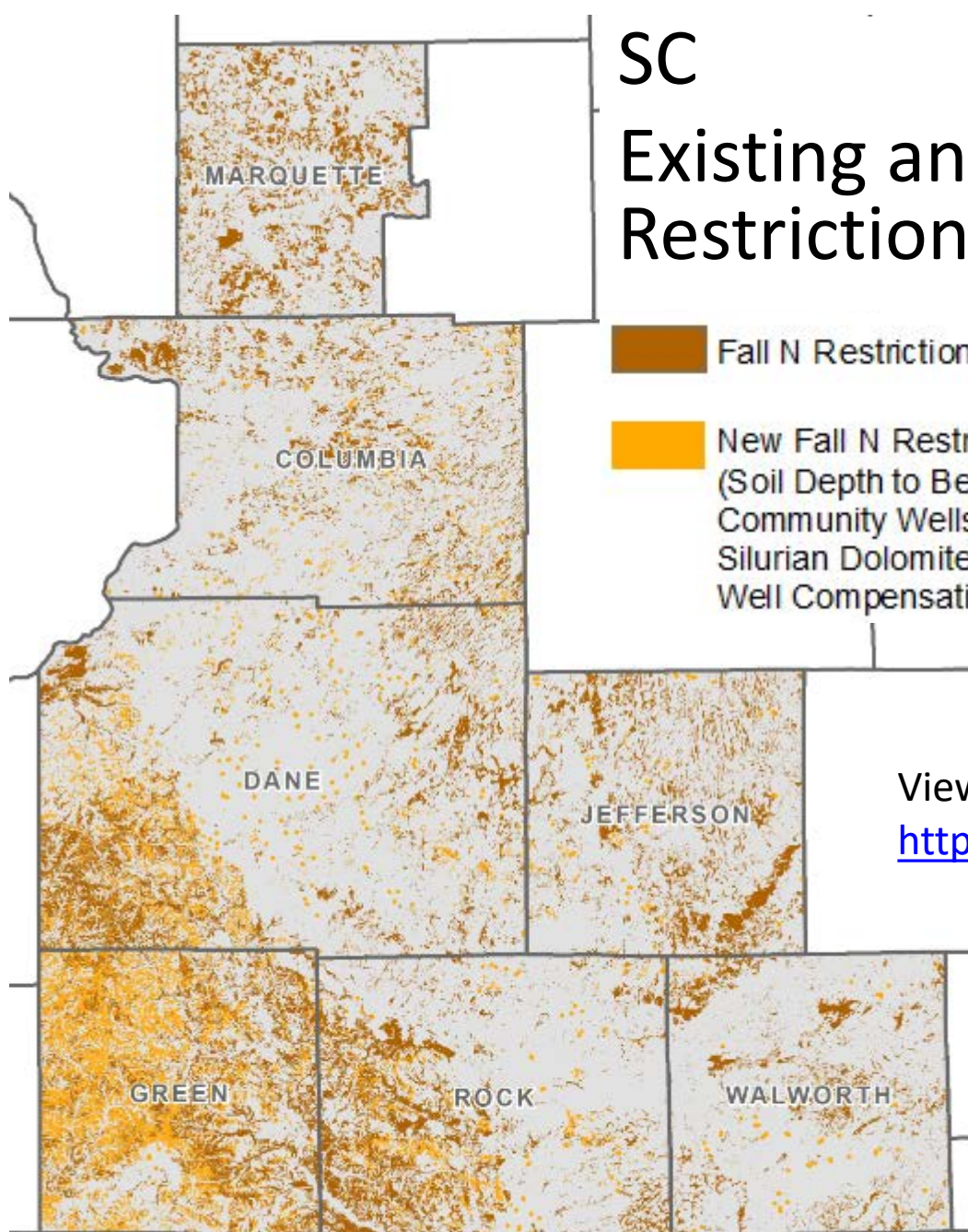
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 Silurian Dolomite - 5 ft. or Less Soil Depth to Bedrock,
 Well Compensation Areas for Manure Contamination)

SC

Existing and New Fall N Restriction Cropland Areas



 Fall N Restriction areas

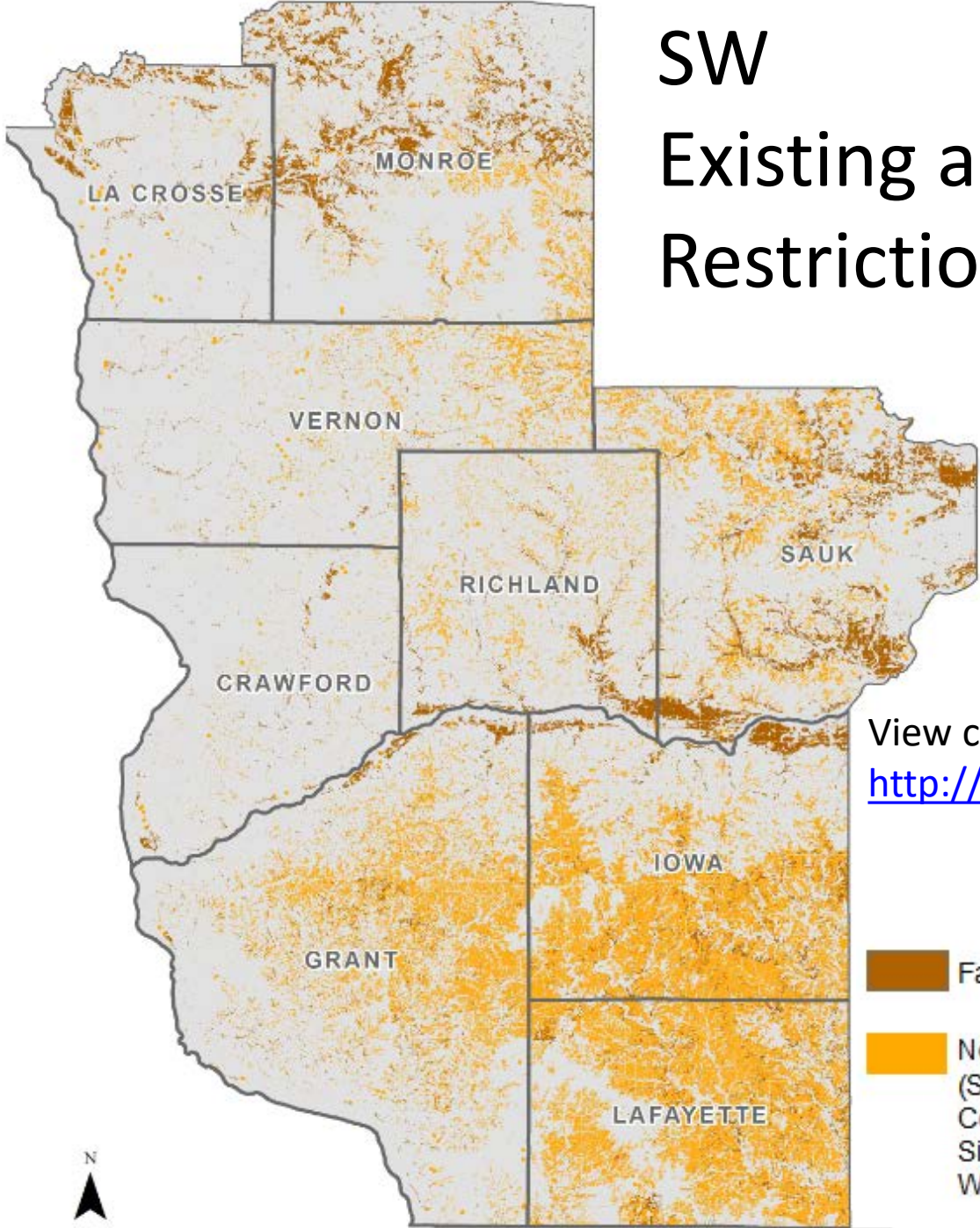
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Washington, DC.



SW

Existing and New Fall N Restriction Cropland Areas



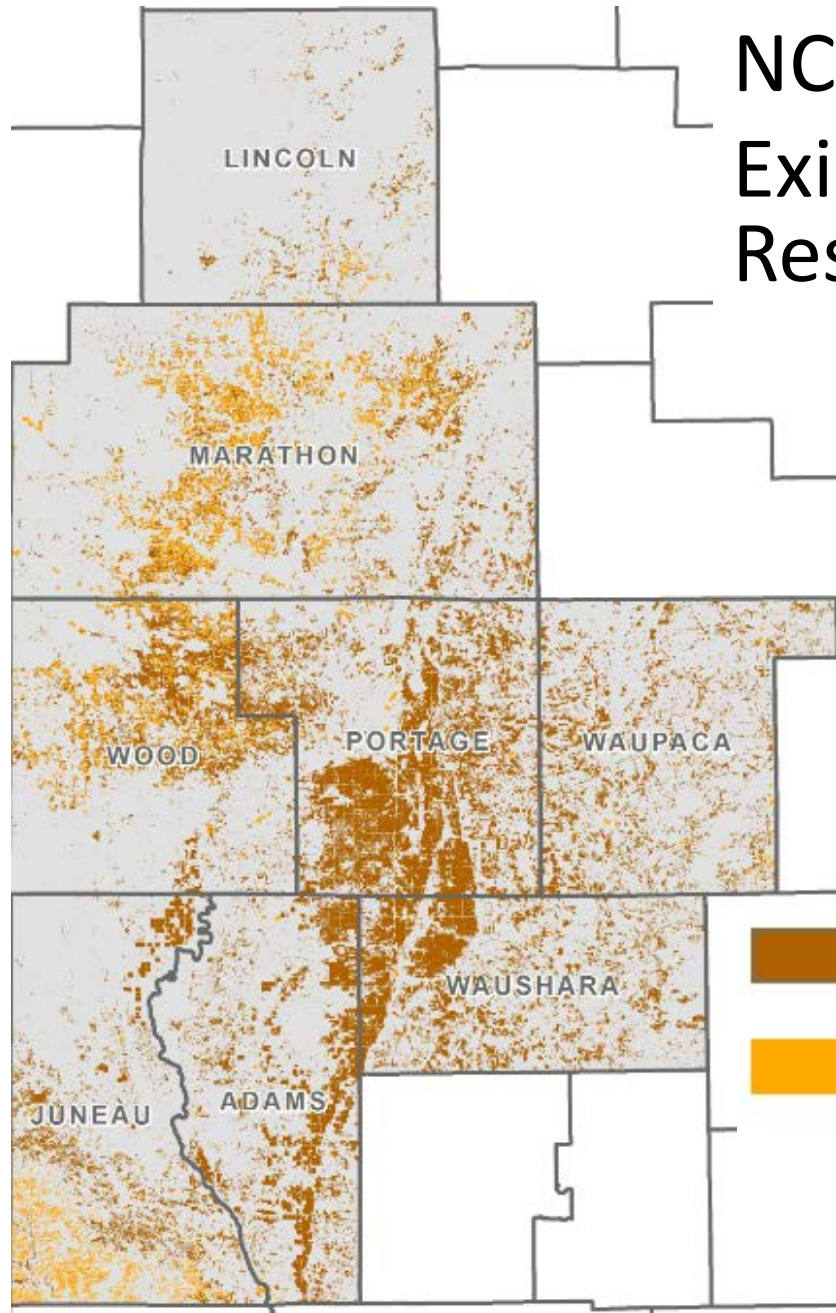
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View current & proposed 590 restrictions at <http://snappplus.wisc.edu/maps>

-  Fall N Restriction areas
-  New Fall N Restriction Areas
(Soil Depth to Bedrock - Less than 5 ft,
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Silurian Dolomite - 5 ft. or Less Soil Depth to Bedrock,
Well Compensation Areas for Manure Contamination)



NC

Existing and New Fall N Restriction Cropland Areas



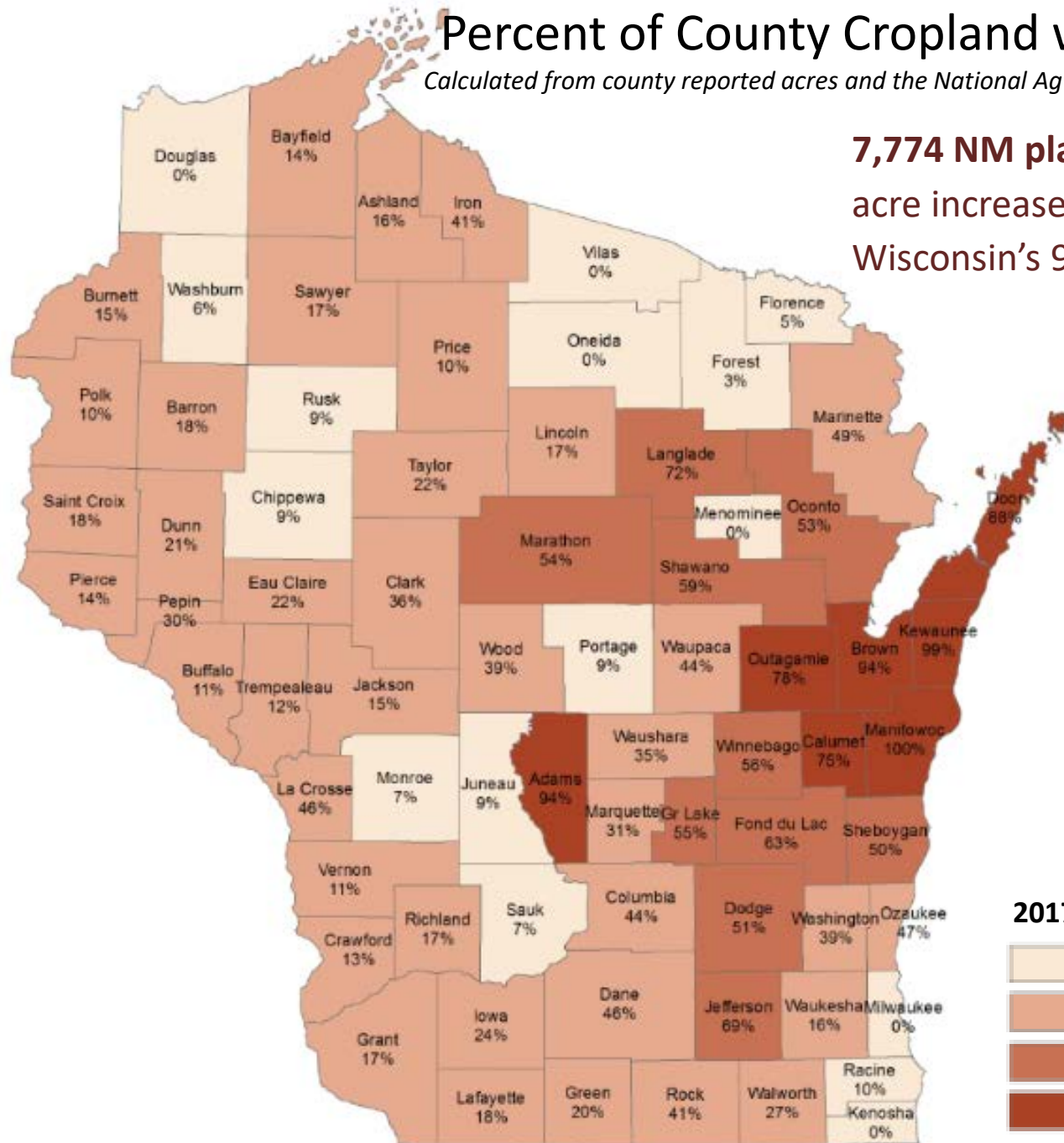
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Percent of County Cropland with 2017 NM Plans

Calculated from county reported acres and the National Ag Statistics Service county cropland 2012



7,774 NM plans on 3,345,174 acres a 13% acre increase from 2016, covering 36% of Wisconsin's 9 million cropland acres.

1,841 farmers wrote their own plans on 536,515 acres 40,761 more acres than 2016.

24% of plans 16% of acres

5,933 farmers hired 93 **agronomists** to plan 2,808,659 acres 346,129 more acres than 2016.

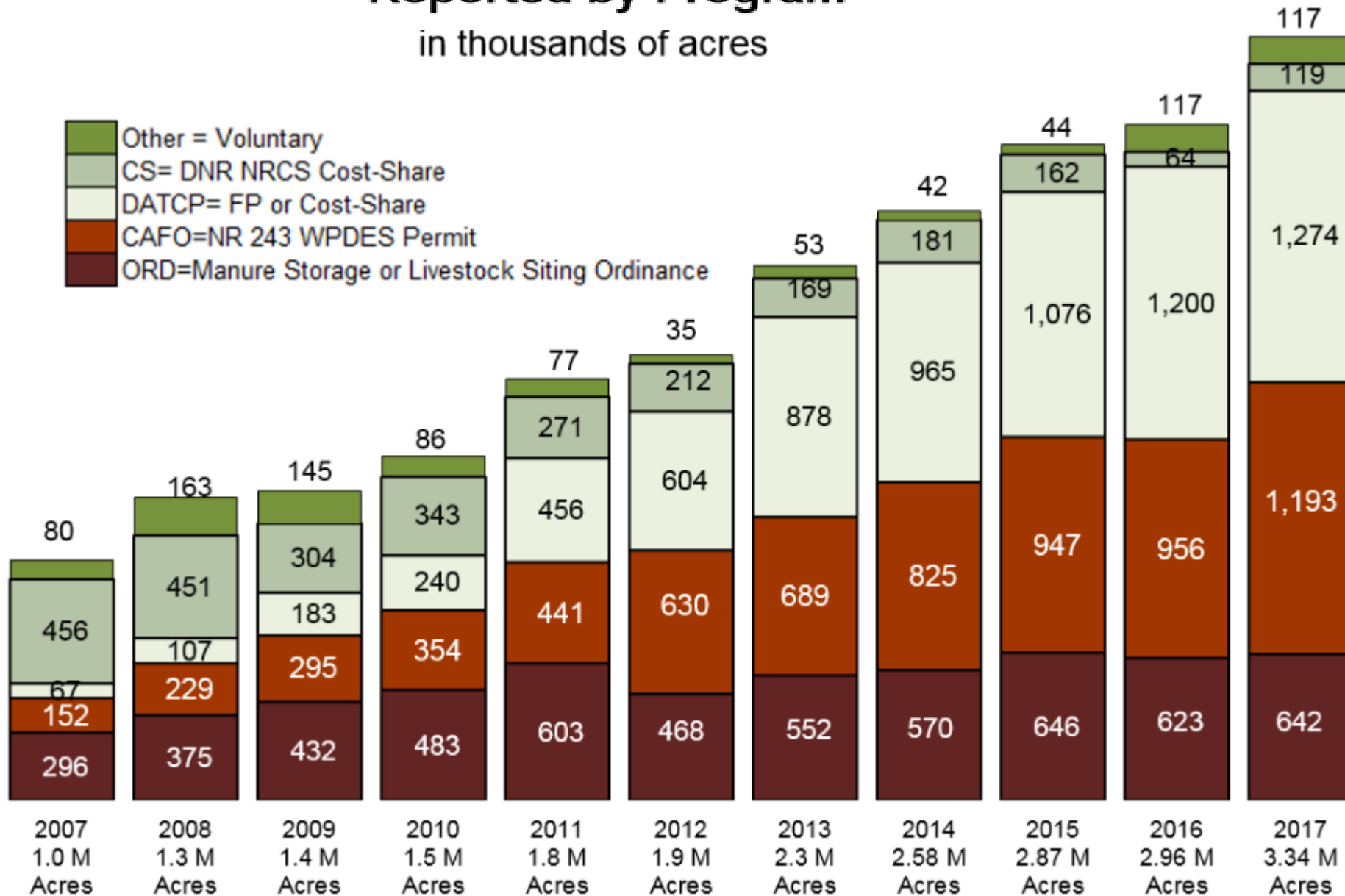
76% of plans 84% of acres

2017 % cropland with NMPs

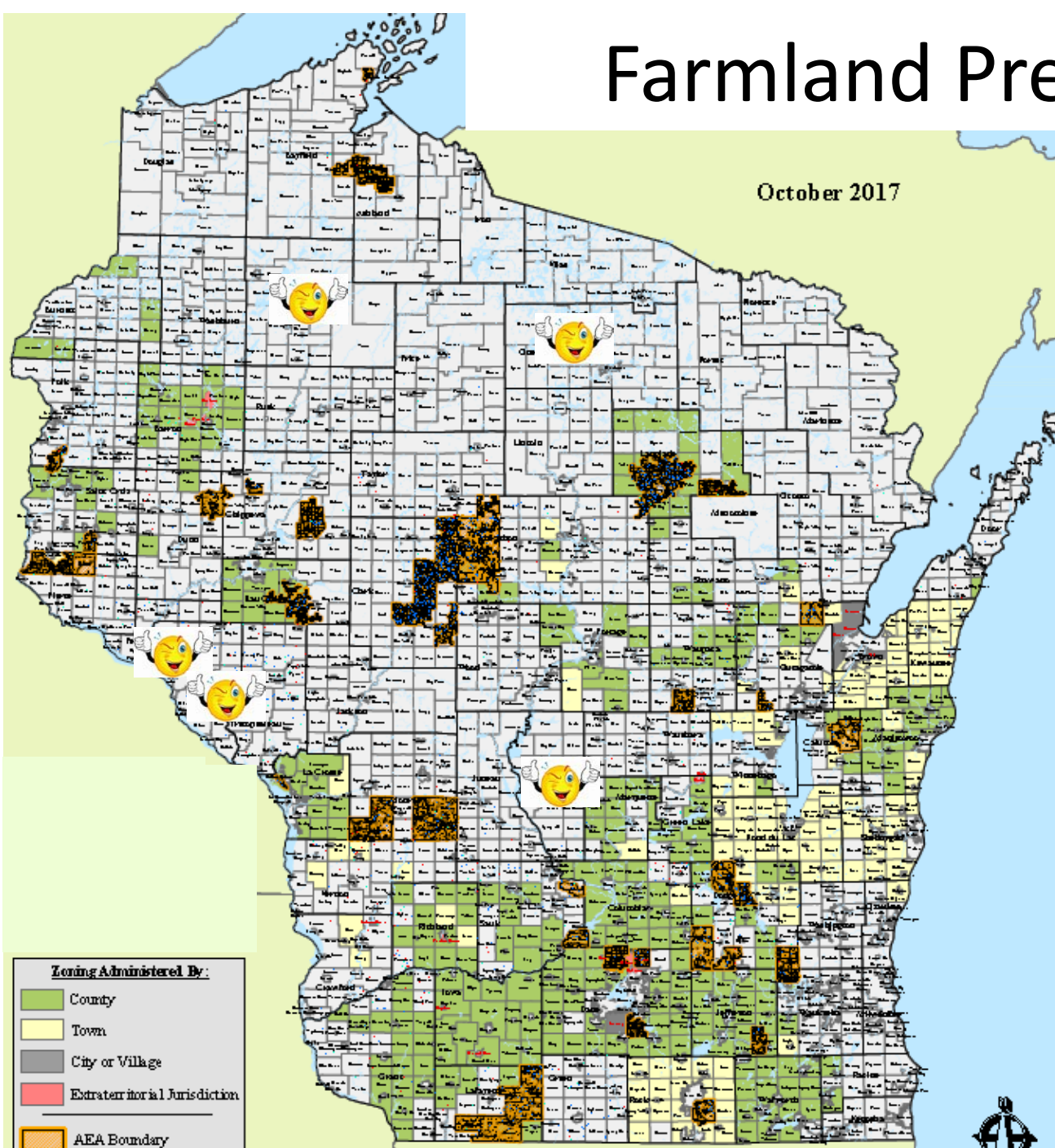
- 0% - 9%
- 10% - 49%
- 50% - 74%
- 75% - 100%

2007-2017 Nutrient Management Plan Acres Reported by Program

in thousands of acres



Farmland Preservation



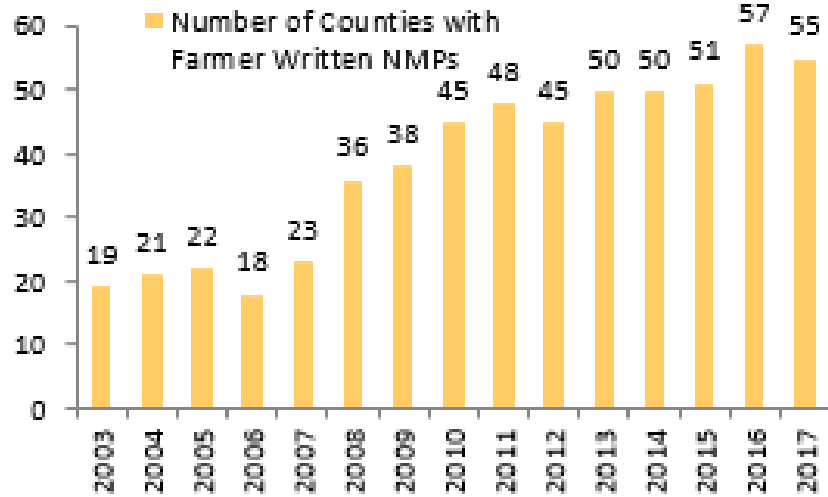
Encourages:

- ✓ Agricultural land use
- ✓ Economic development
- ✓ Protects soil and water

- FP Annually covers 2.5 M acres = \$18 M sum sufficient income tax refund/credit
- New FP zoned areas are coming in 2018 (\$7.50/A) 🤗
- AEA cover 1.1 M acres with 650 agreements on 142,000 acres (\$5/A or \$10/A if FP zoned)
- Landowners outside FP zoned areas or AEAs who want to participate may create an AEA when at least 5 landowners work with local governments to petition DATCP for designation.

Number of Counties with Farmer Written

NM Plans



Nutrient Management Farmer Education Grants

- Max. grant \$20K to produce 590 compliant NMPs
- Applications available by January 31 of every year, due on April 15 of that same year
- Max. \$500 stipend and \$750 for soil testing
- Who can apply? Organizations of: **educators, conservationists, producers, lakes/watersheds, or agronomists**

