

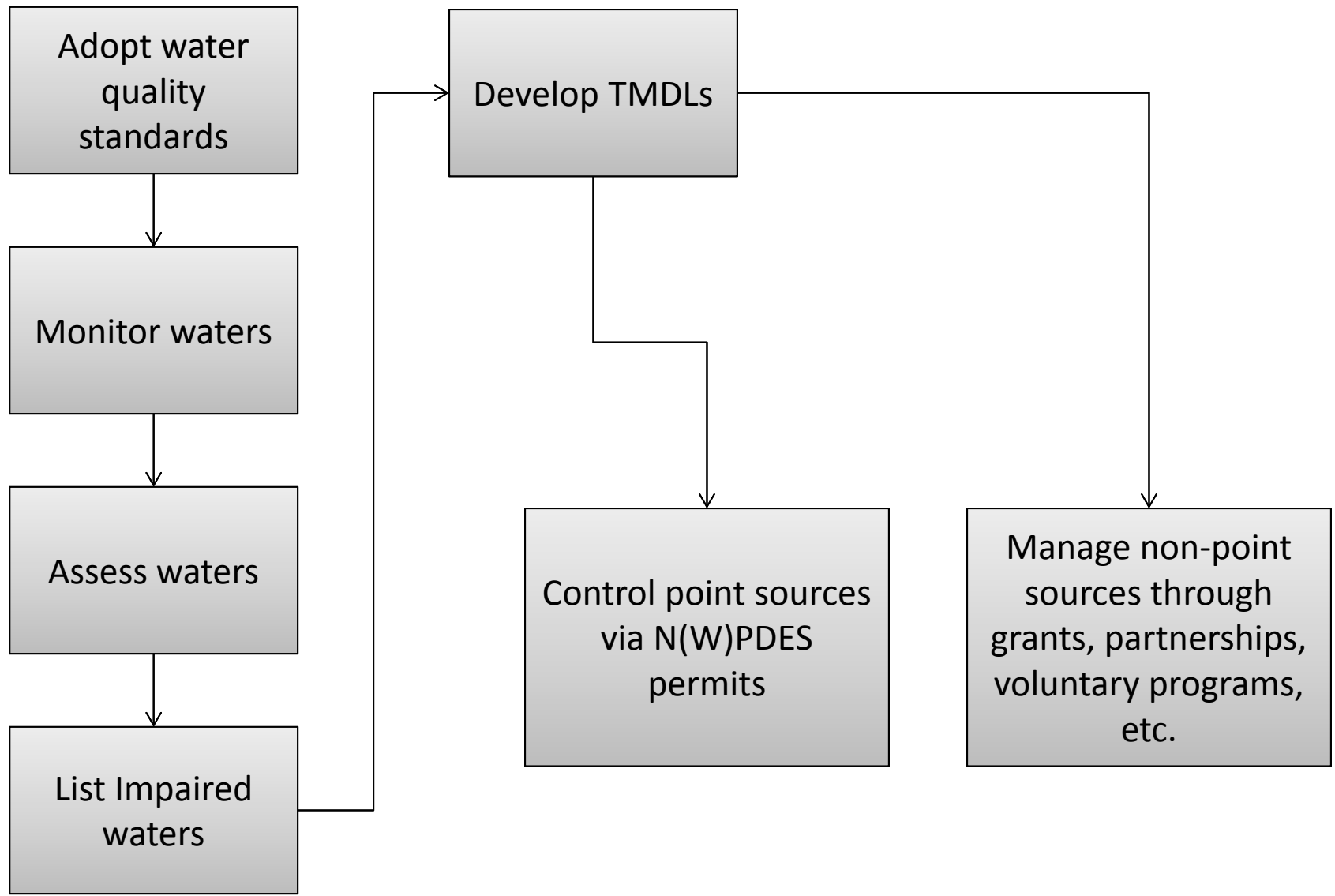
Communicating TMDL Goals on Agricultural Lands



***Aaron Ruesch, Kevin Kirsch, and Andrew Craig
Bureau of Water Quality
Wisconsin DNR***







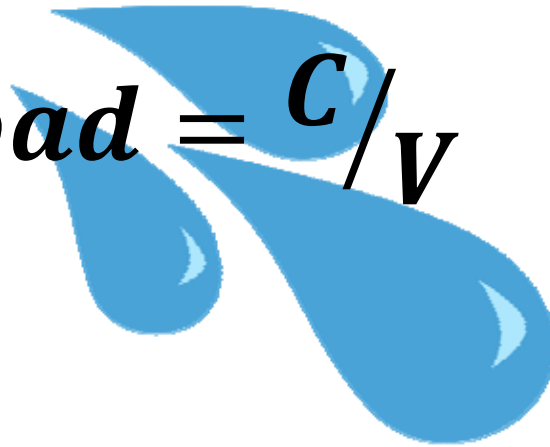
Point sources and N(W)PDES



$$\frac{\textit{Mass}}{\textit{Volume}}$$



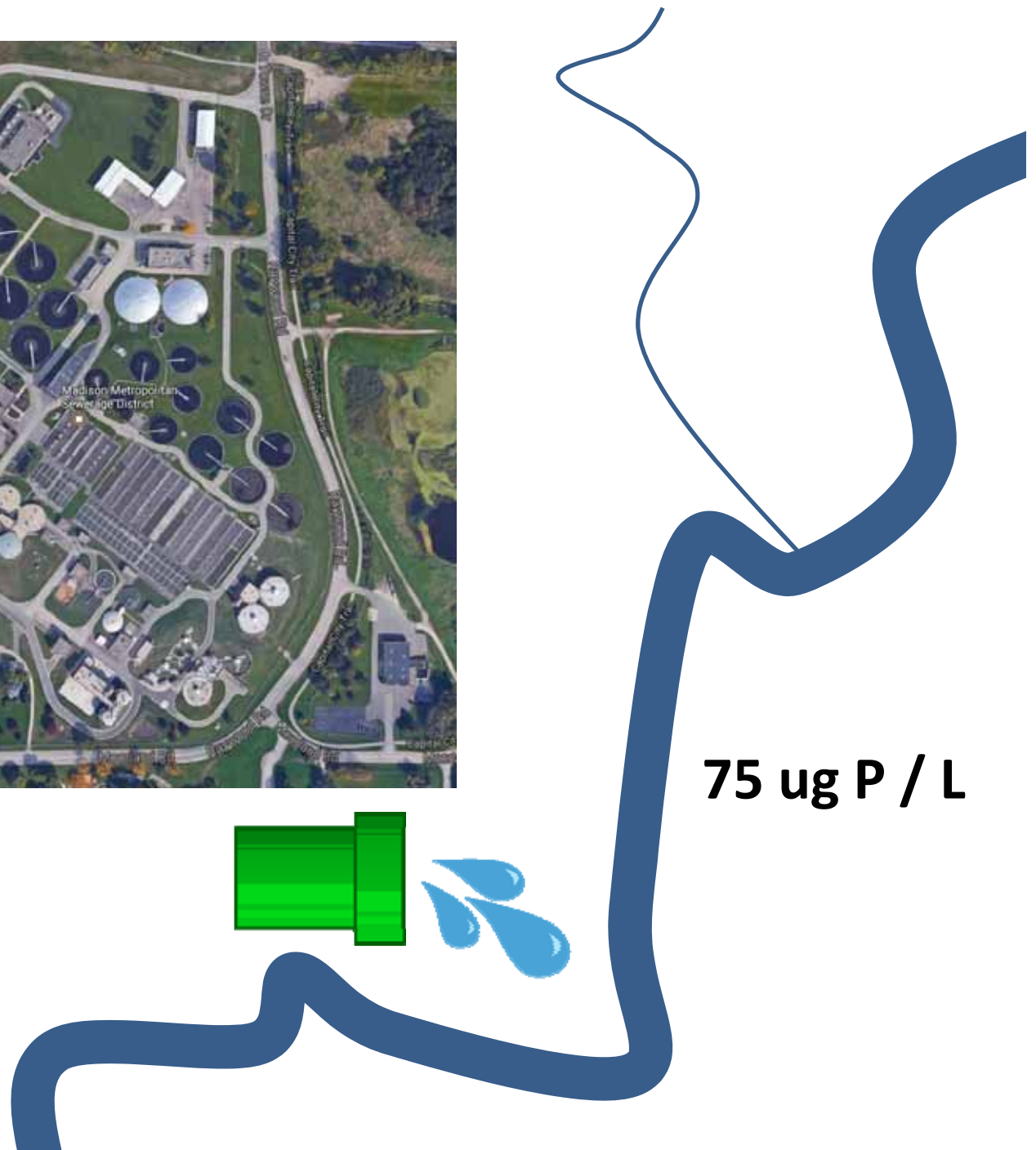
$$\textit{daily load} = C/V$$

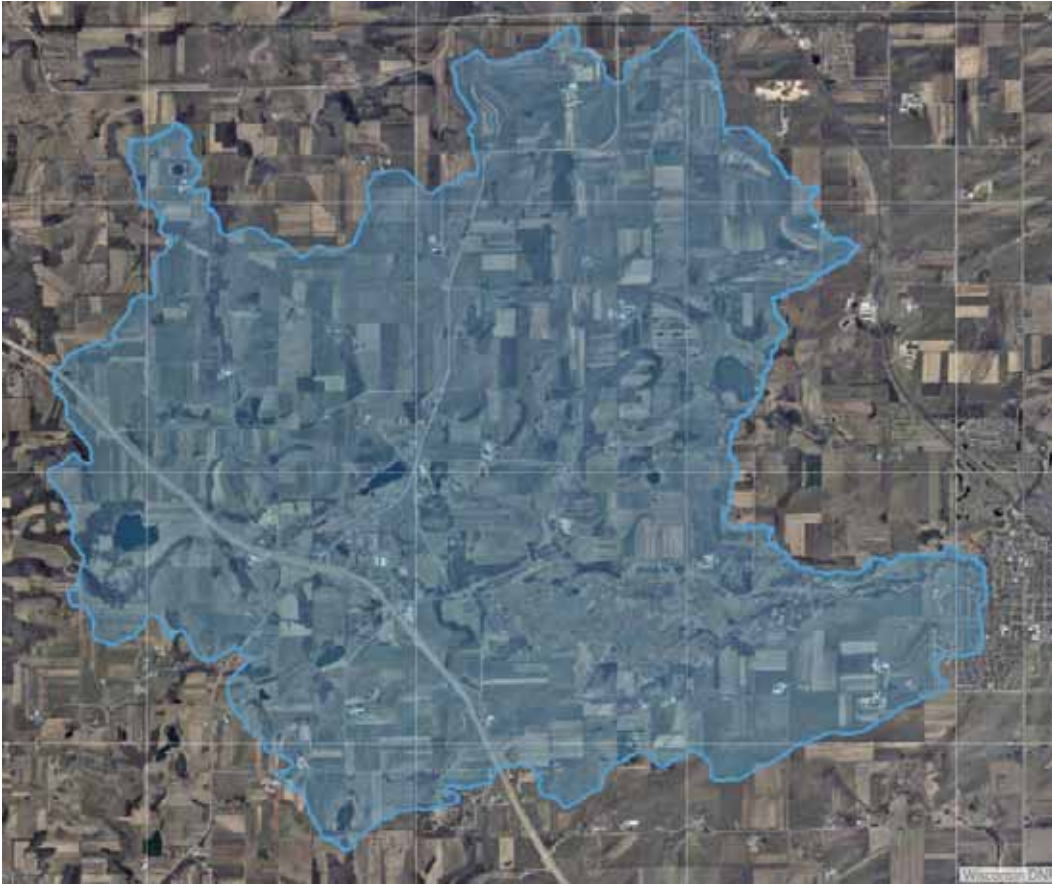


Volume

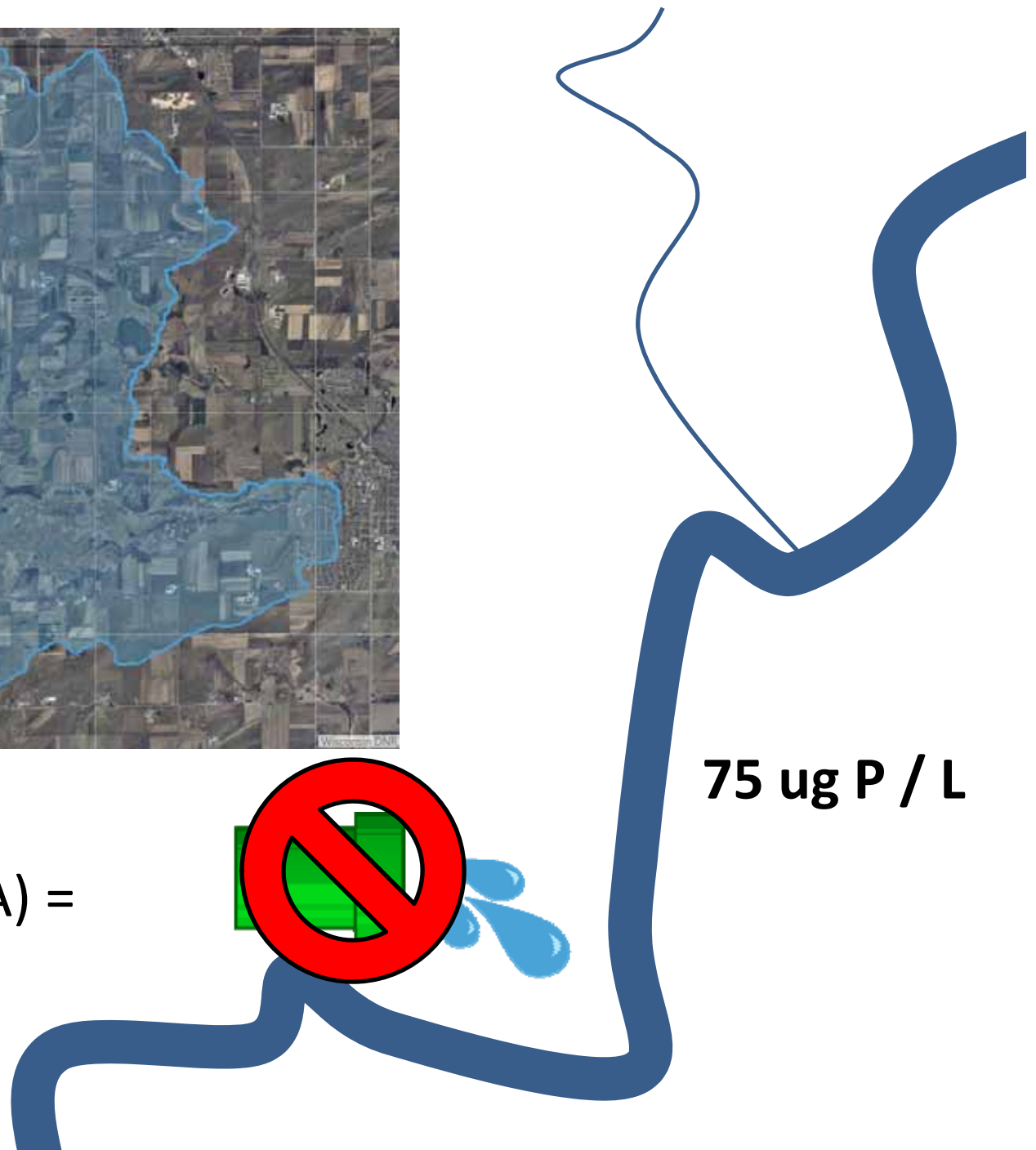


Waste Load
Allocation (WLA) =
8 lbs P / day





Load Allocation (LA) =
6 lbs P / day



Agricultural LA typically lumps The Good, The Bad, and The Ugly



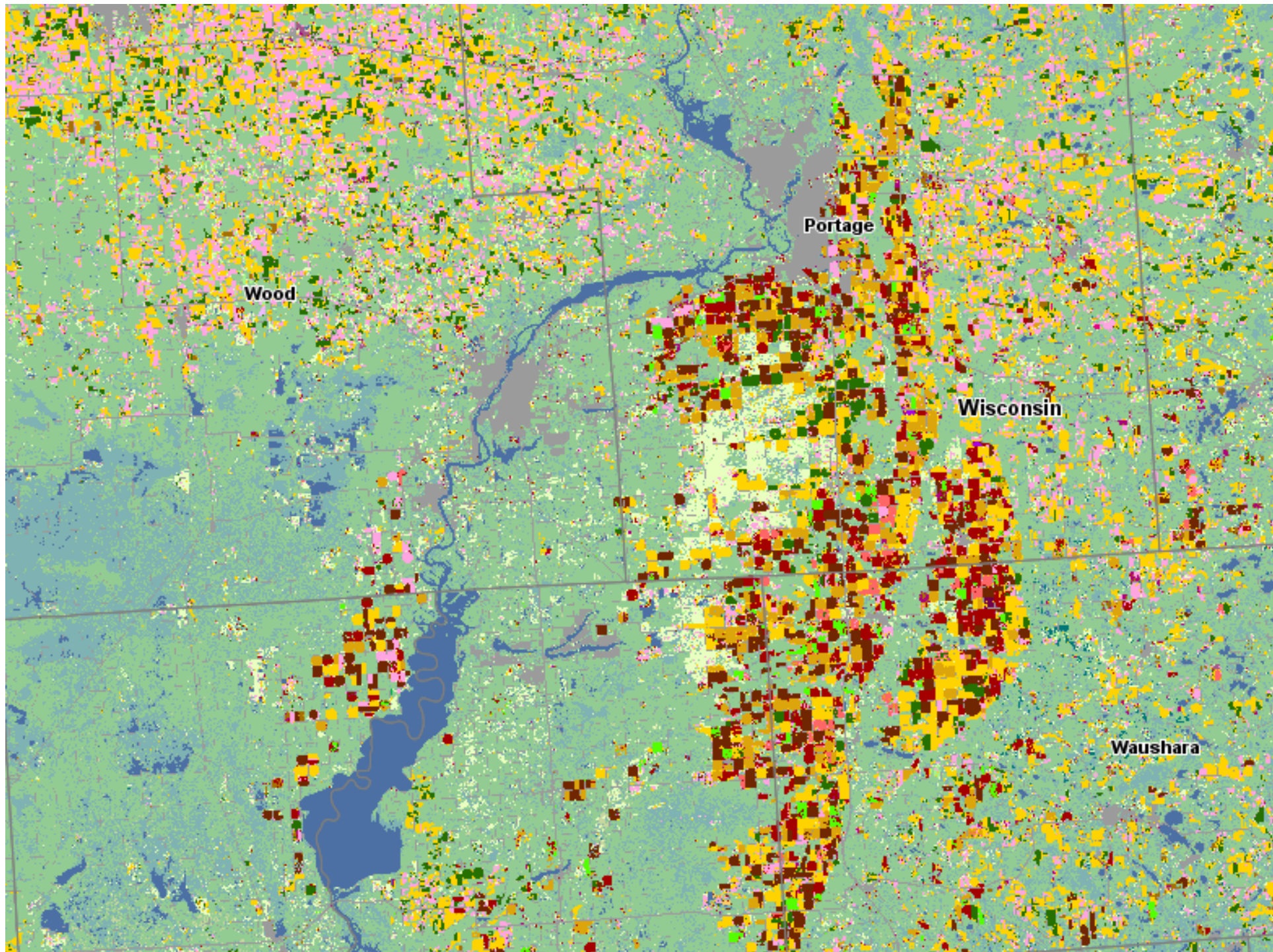
Another **problem**:

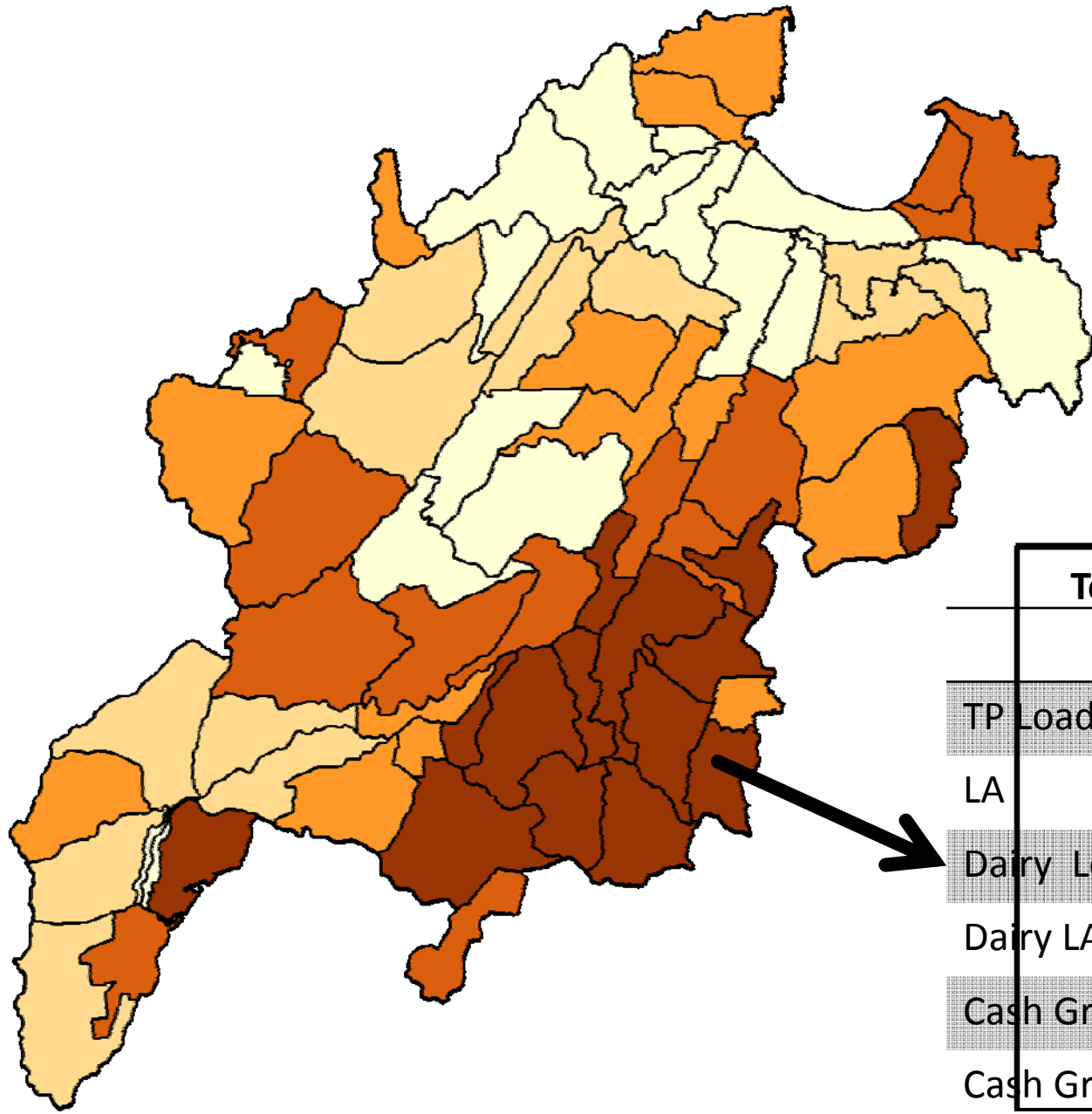
o
t
a
l

a
x
i
m
u
m

Solution: A Better Defined Load Allocation

1. Split LA by land use
 1. Developed land
 2. Agricultural fields and pasture
 1. Dairy vs. cash grain vs. potato/vegetable
2. Use % reduction instead of LA
3. Link the LA to an implementation mechanism or field-scale tool





Total Phosphorus Yield	
(lbs/acre)	
TP Load	0 – 0.12000 lbs
LA	0.1 – 0.20 lbs
Dairy Load	0.3 – 0.500 lbs
Dairy LA	0.5 – 1.150 lbs
Cash Grain Load	> 1 500 lbs
Cash Grain LA	50 lbs

Percent reduction vs. load allocation

1. Allows watershed managers to use their own models for simulating compliance scenarios
2. Allows producers to estimate their own load allocation from their own estimated baseline

Plum-Kankapot 9-Key Element Plan

- STEPL
 - Watershed model that estimates load and BMP efficiency
- 1. Estimated baseline load in STEPL
- 2. Ran compliance scenarios
 - 1. Cover crops
 - 2. Streambank stabilization, etc.
- 3. Did the compliance scenario meet the TMDL percent reduction from the baseline calculated in STEPL?

Percent reduction vs. load allocation

1. Allows watershed managers to use their own model for simulating compliance scenarios
2. Allows producers to estimate their own load allocation from their own estimated baseline



DEPARTMENT OF
SOIL SCIENCE
University of Wisconsin-Madison



Published under s. 19.33, Wis. Stat., by the Legislative Reference Bureau.
DEPARTMENT OF NATURAL RESOURCES
NR 151.002

Subchapter 1 - General Provisions
NR 151.001 Purpose
NR 151.002 Definitions
NR 151.003 Short Title
NR 151.004 Scope
NR 151.005 Authority
NR 151.006 Construction
NR 151.007 Interpretation
NR 151.008 Severability
NR 151.009 Repeal
NR 151.010 Effective Date

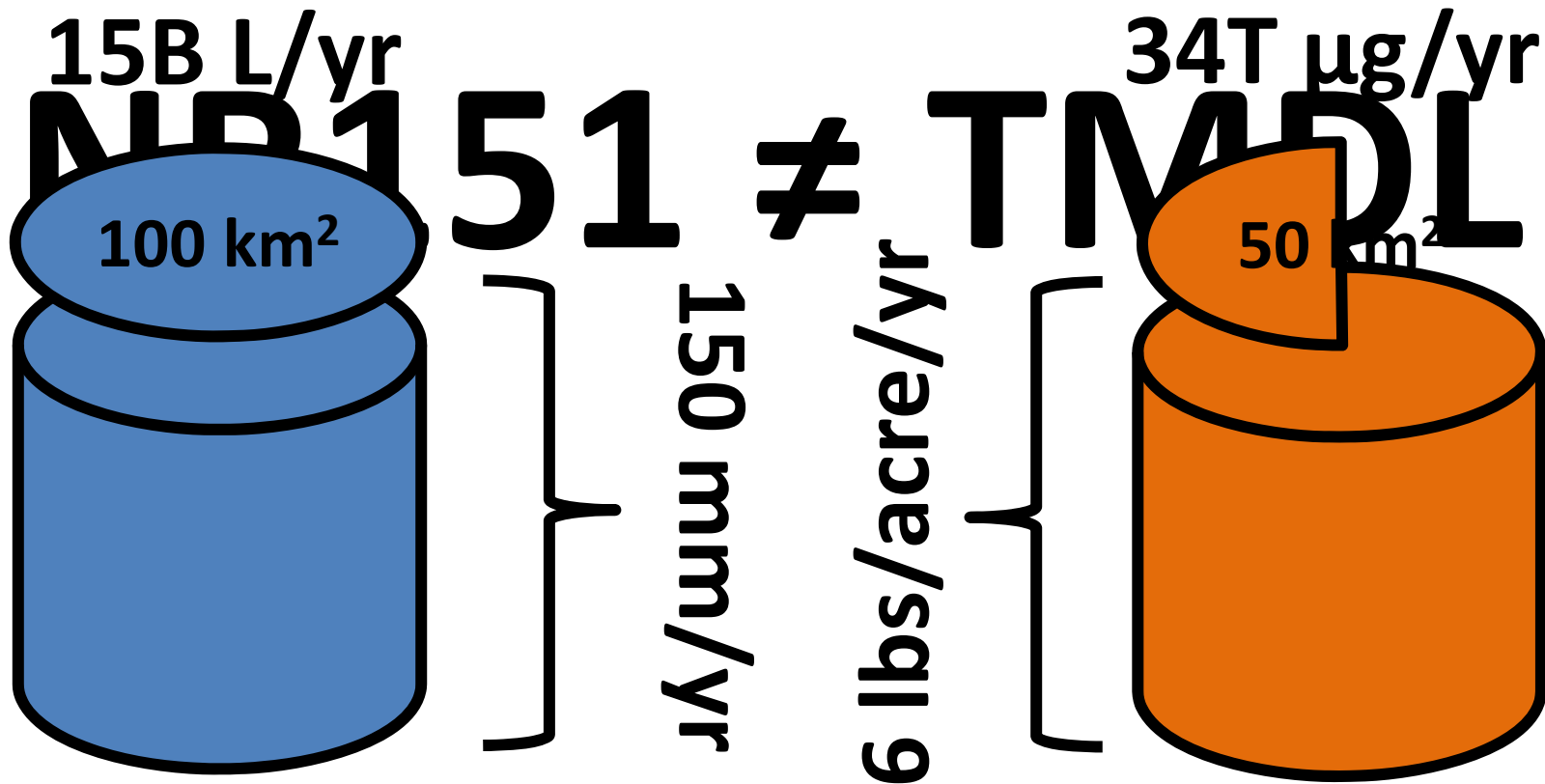
$A < T$

TP < 6 lbs/acre

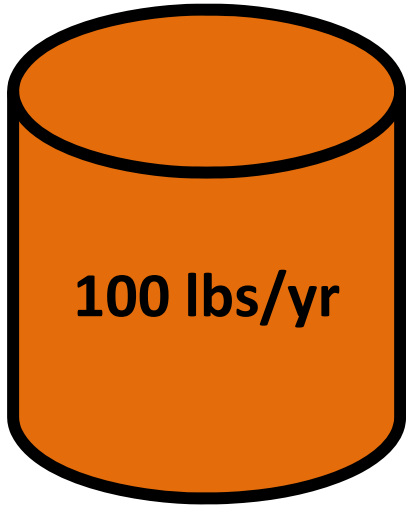
(1) "Average annual precipitation" means the average annual precipitation as determined by the State of Wisconsin, such as SCA, P, or any other method approved by the Department of Natural Resources, based on the location closest to the water quality site.
Note: Information on how to access the SCA, P, and other data is available on the website of the Department of Natural Resources at <http://dnr.wisconsin.gov>.

Published under s. 19.33, Stats. Updated on the first day of each month. Entire code is always current. The Register date on each page is the date the chapter was last published.
Register Issues: 2017 No. 151

$$2,200 \mu\text{g/L} \div 2 = 1,100 \mu\text{g/L}$$

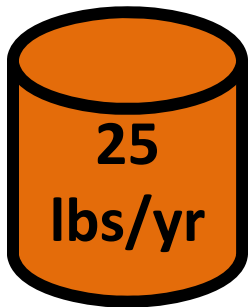


**Ag will have to
do more than
NR151 to meet
TMDL goals**



100 lbs/yr

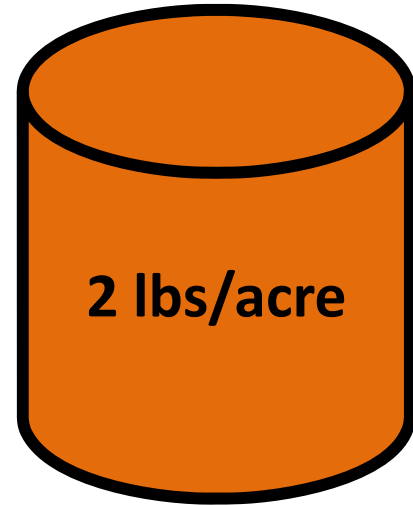
TMDL baseline TP



25
lbs/yr

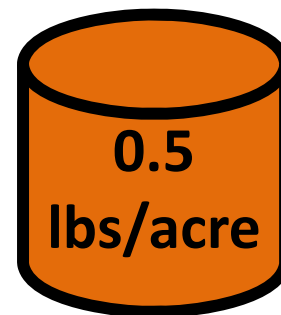
TMDL LA

75% reduction



2 lbs/acre

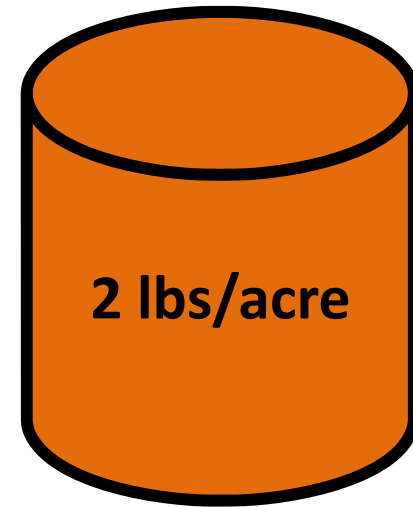
*SnapPlus baseline TP



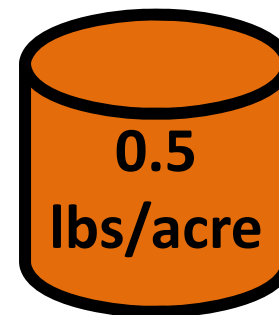
0.5
lbs/acre

TMDL LA

***SnapPlus
baseline must
use the same
model
assumptions
about ag that
were used in the
baseline TMDL
model.**

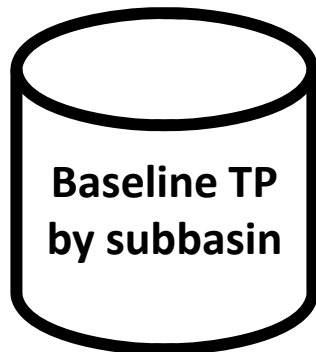
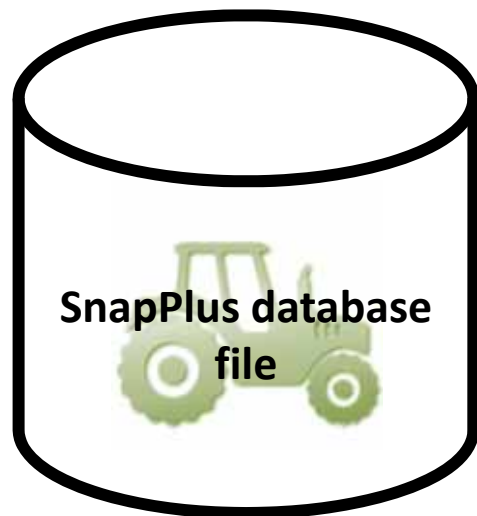


***SnapPlus baseline TP**



TMDL LA

SnapPlus automation

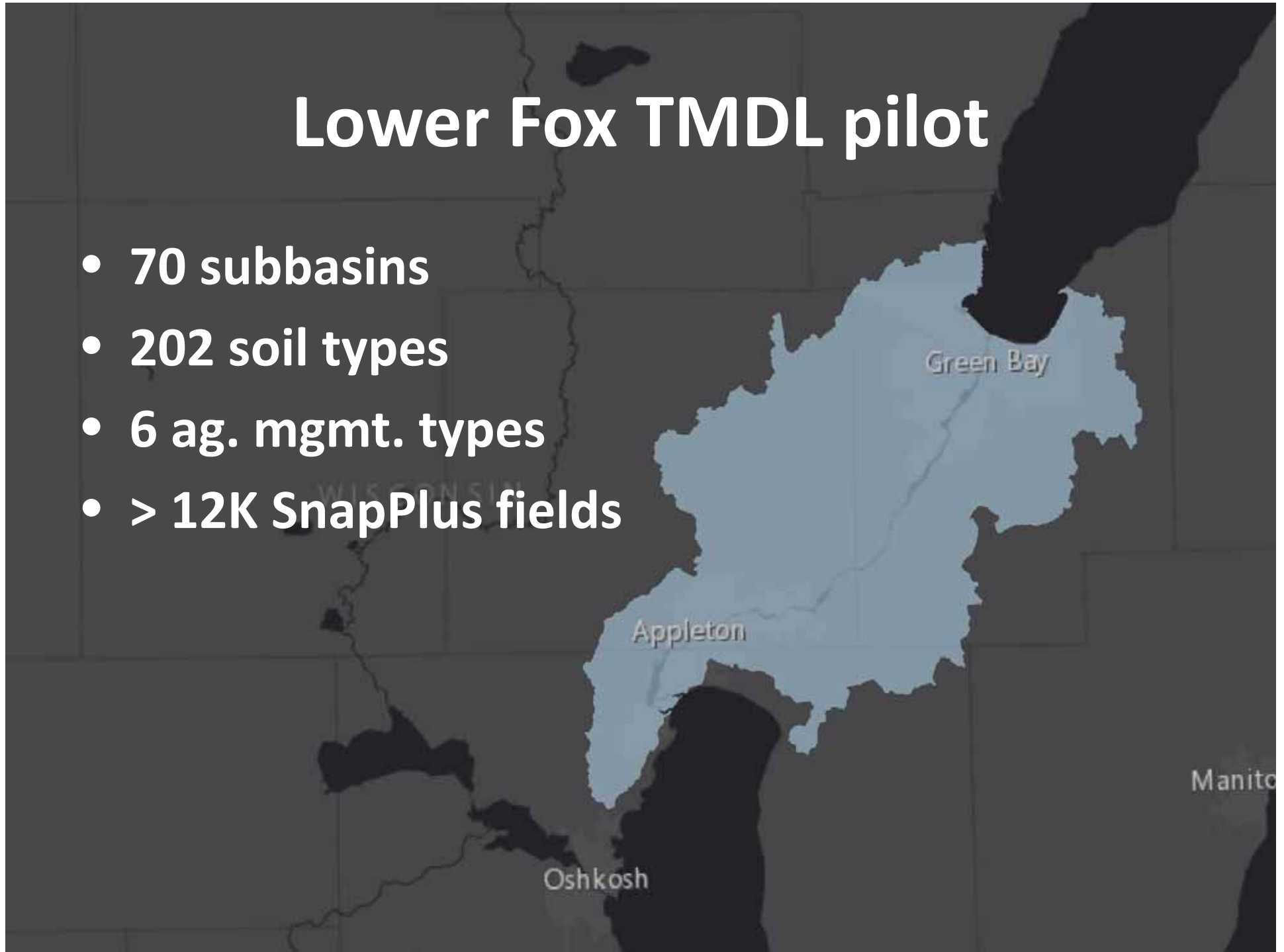


Thousands of subbasin, landuse, soil combinations

SUB	TMDL model LU	Soil type	AREA
1	dairy1	WtA	8
1	dairy1	MtA	5
1	dairy2	ShA	6
1	dairy2	MeC	1
1	cash1	FeC	1

Lower Fox TMDL pilot

- 70 subbasins
- 202 soil types
- 6 ag. mgmt. types
- > 12K SnapPlus fields



Deliverables

Subbasin	Baseline LA (lbs/acre)	TMDL % reduction	SnapPlus LA (lbs/acre)
1	2	50	1
2	1	50	0.5
3	0.5	0	0.5
4	1.5	20	1.2

Subbasin	Soil type	Baseline LA (lbs/acre)	TMDL % reduction	SnapPlus LA (lbs/acre)
1	WtA	2	50	1
1	MtA	1	50	0.5
2	ShA	0.5	0	0.5
2	MeC	1.5	20	1.2

The goal

“SnapPlus can help me figure out how to meet a LA of 1.5”

“daily load?”



Questions

