After TMDL Approval: The Next Steps in the Lower Fox River Watershed

Keith Marquardt
Water Resource Management Specialist, WDNR

Wisconsin Crop Management Conference
Jan 16, 2013

WISCONSIN
DEPT. OF NATURAL RESOURCES

Total Maximum Daily Load

Watershed approach

TMDL = WLA + LA + MOS

for a particular pollutant
(examples: pathogens, nutrients, etc.)

How did we get to TMDLs?

- Clean Water Act of 1972- Federal Law
  - Amended in 1977
  - Established 303(d) and TMDL in law
- Reliance on NPDES process with little early use of TMDL process
- Legal challenges in 80s - 90s because of the non-use of TMDLs
- EPA ramps up 303(d) + TMDL processes in 2000

What is an 303(d) or Impaired Water?

- Waters that do not meet designated uses
- Waters that do not meet water quality criteria

Water Quality Standards

Designated Uses:

- Fish & Aquatic Life
- Public Health
- Recreation

Water Quality Criteria:

- Numeric: dissolved oxygen, pH, bacteria, toxic substances, phosphorus, etc.
- Narrative: “no objectionable deposits,” “substances in concentrations or combinations shall not be harmful to humans, fish, plants, or other aquatic life.”

Phosphorus Criteria NR 102.06

Rivers NR 102.06(3)(a) = 100 µg/L

Streams = 75 µg/L

- All unidirectional flowing waters not in NR 102.06(3)(a)

Reservoirs

- Stratified = 30 µg/L
- Not Stratified = 40 µg/L

Lakes range from 15-30 µg/L

Lake Michigan =7 µg/L

Lake Superior = 5 µg/L

Exclusions

- Ephemeral Streams
- Wetlands
- Lakes <5 ac

What are TMDLs?

The amount of a pollutant a waterbody can receive and still meet water quality standards

otal **M**aximum **D**aily **L**oad =

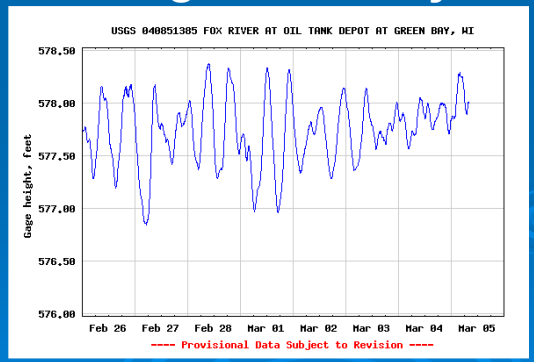
Load Allocation

+

Waste Load Allocation

+

Margin of Safety



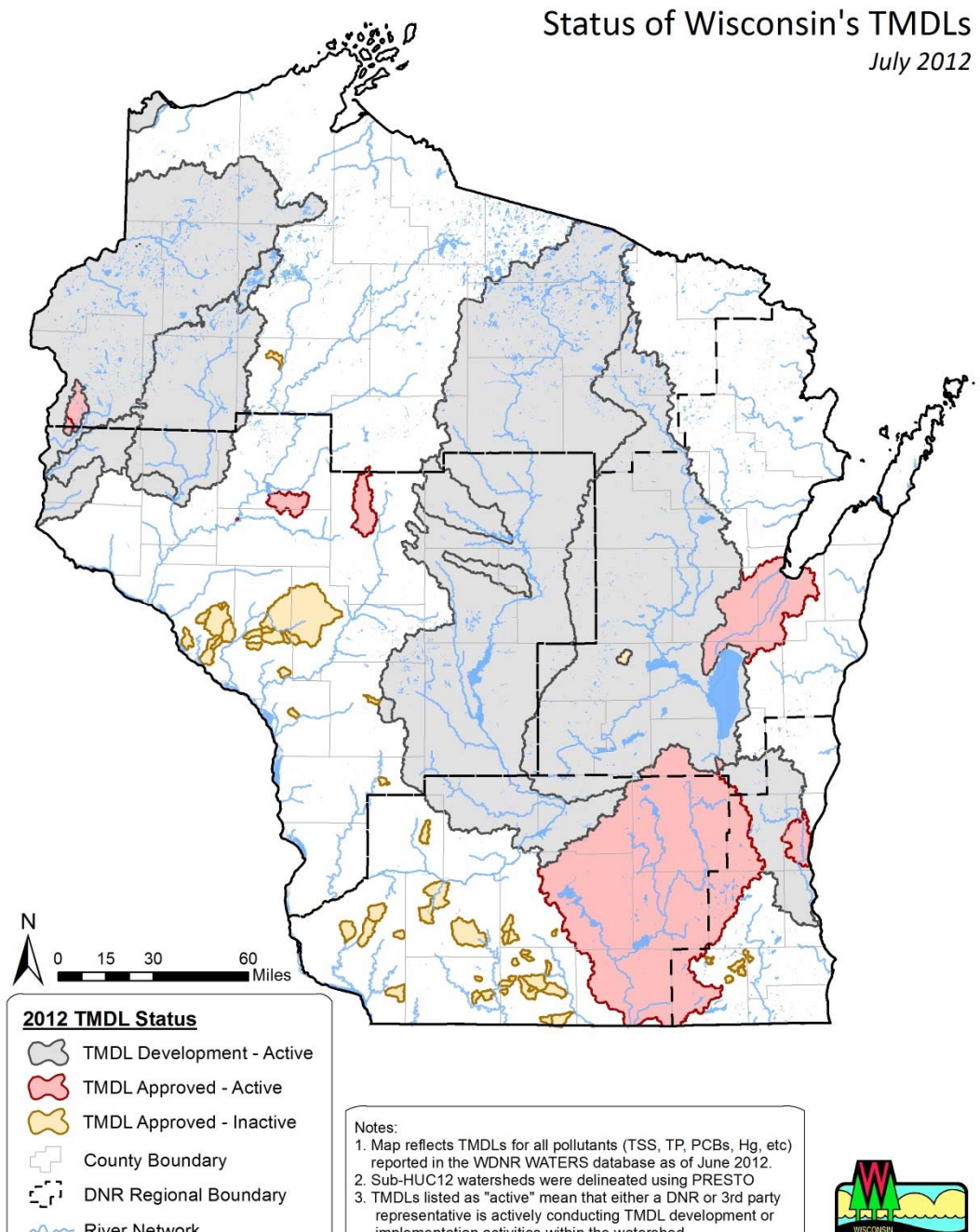
012 TMDL Status

ultiple TMDLs approved 2012.

MDLs under development Milwaukee and sconsin Basins.

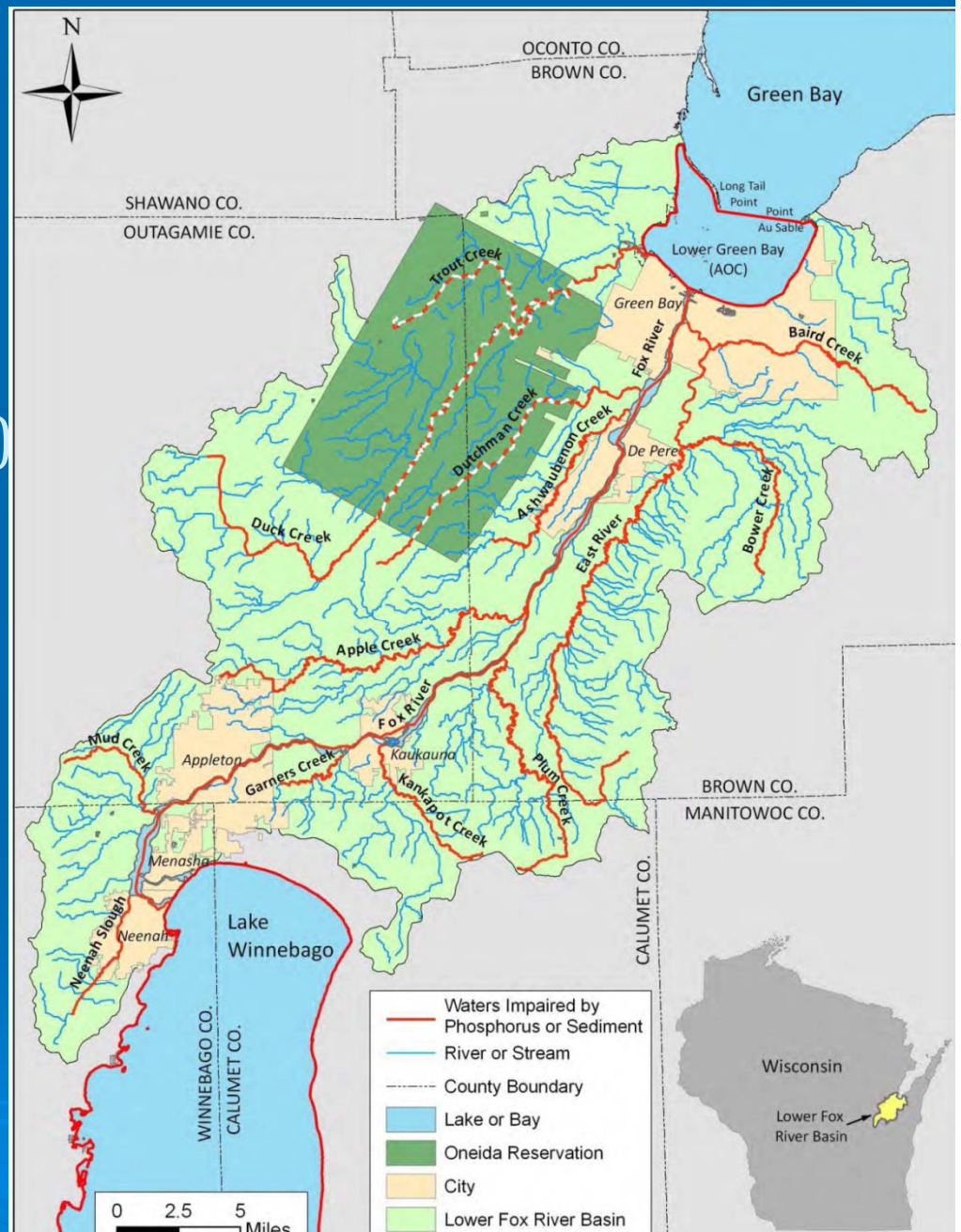
pper Fox River TMDL anned.

ercury TMDL….



r Fox River Basin

Winn to GB
sq mi
miles (17 locks, 12 dams)
ounties &
eida Nation
watersheds
mpaired waters
stretches impaired
mdls
nd TSS
e Winnebago



Phosphorus

Nonmetal, +15

DNA, RNA, cell

Uses: fertilizers

Supplies? Calcium phosphate in rock----------fertilizer

Effects: blue green algae = some toxic

TSS – Total Suspended Solids

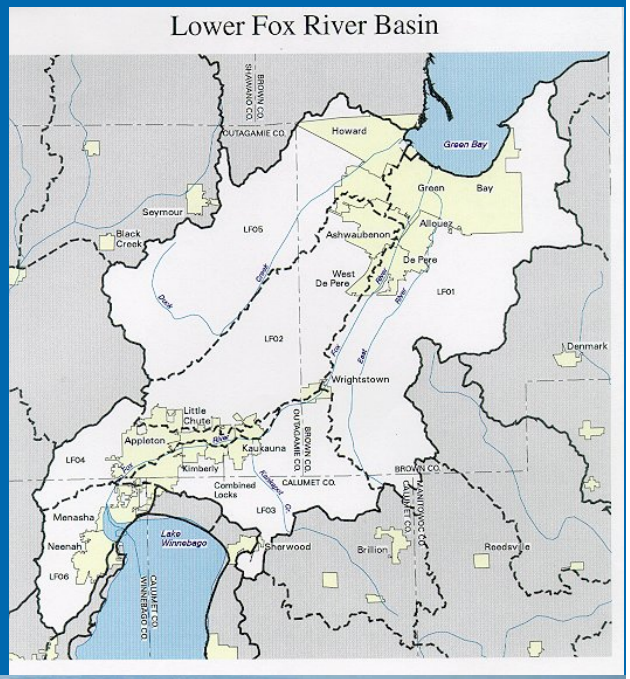
Number 1 pollutant to Wisconsin waters

Effects: irritant, covers nooks in substrate, fills in streams, warms water, depletes oxygen, carries pollutants with it

Sources:

Lower Fox River Basin

VWTF
Municipal (14)
Industrial (20)
IS4s (29)
AFOs (15)
P (##)
rban non-regulated
ackground
forest
other



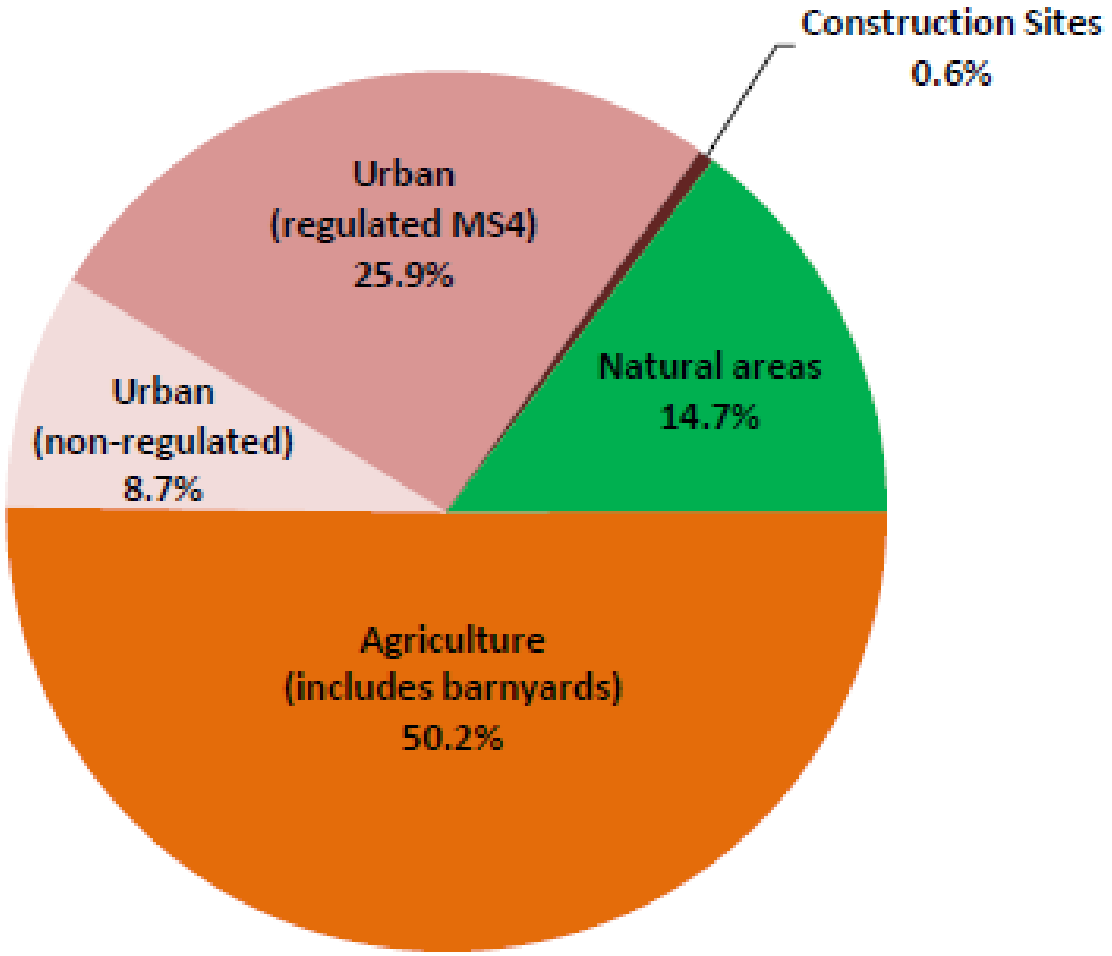
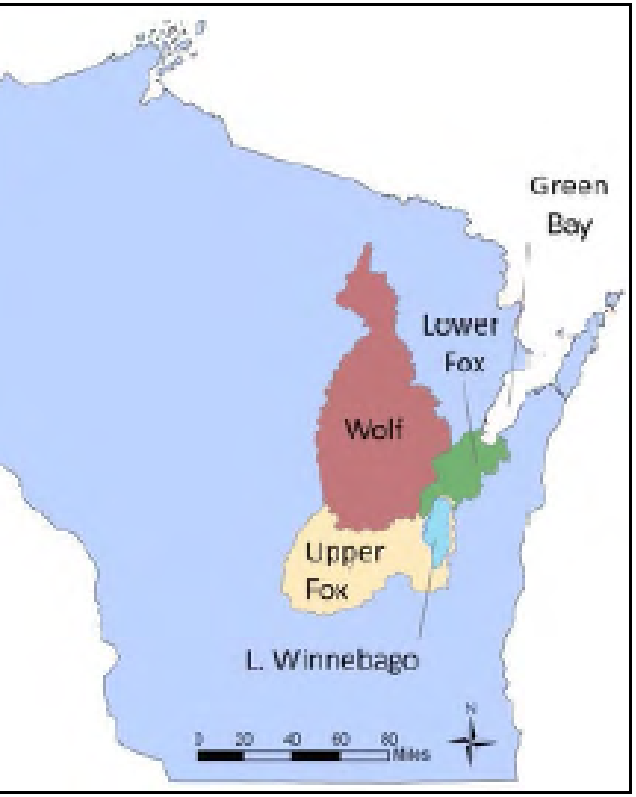


Figure 4. Summary of land use in Lower Fox River Basin

Land Use



7. Drainage basins for the Upper Fox
, Lower Fox River, and Wolf River

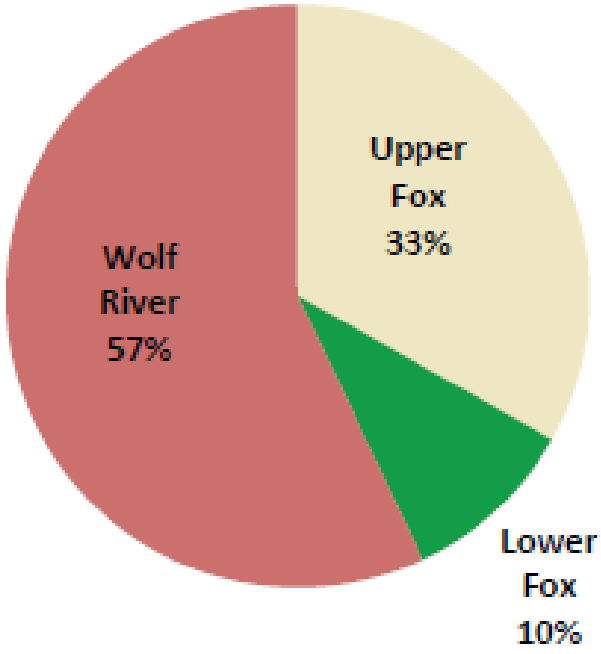


Figure 18. Percent of total land area of
the Fox-Wolf Basin

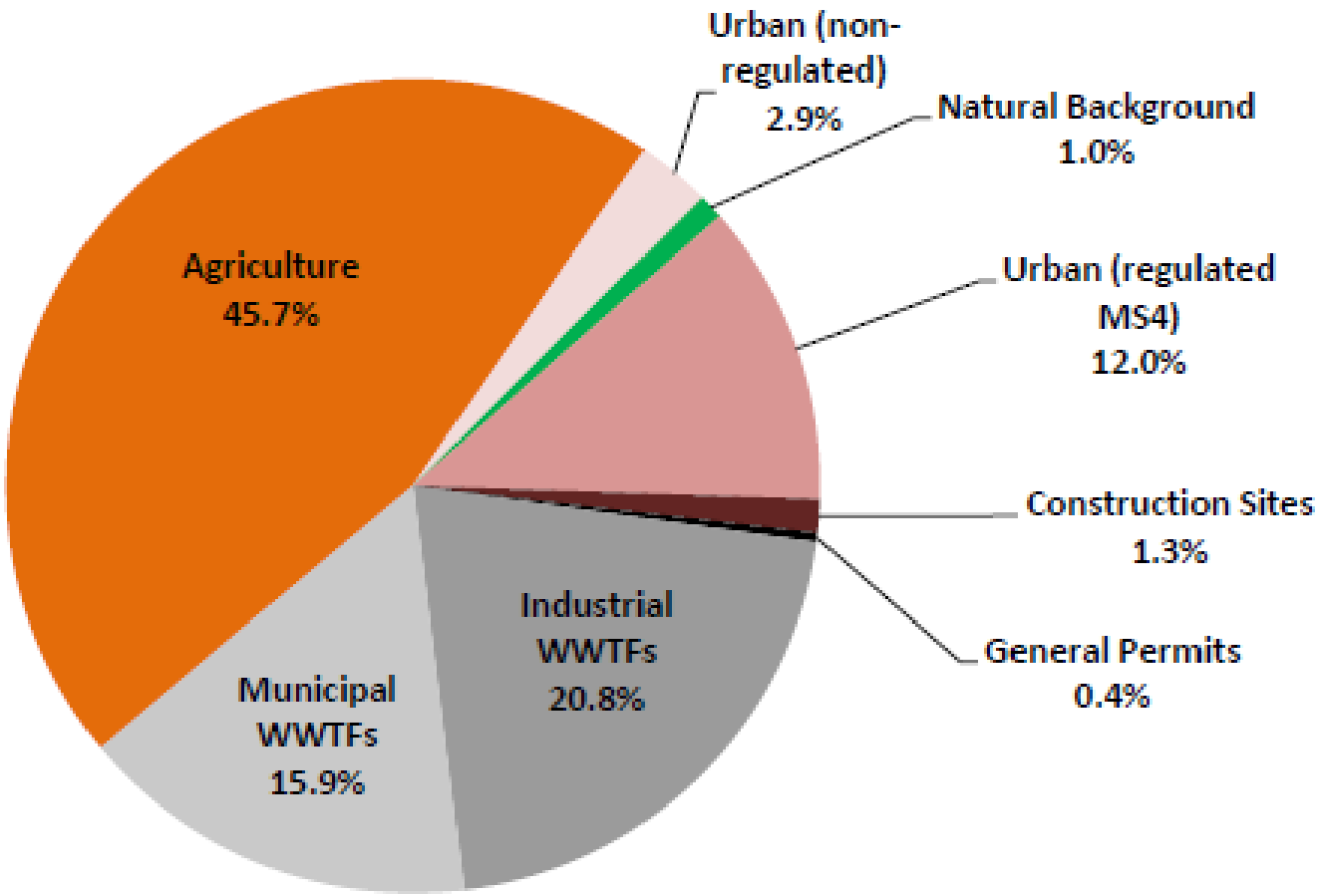
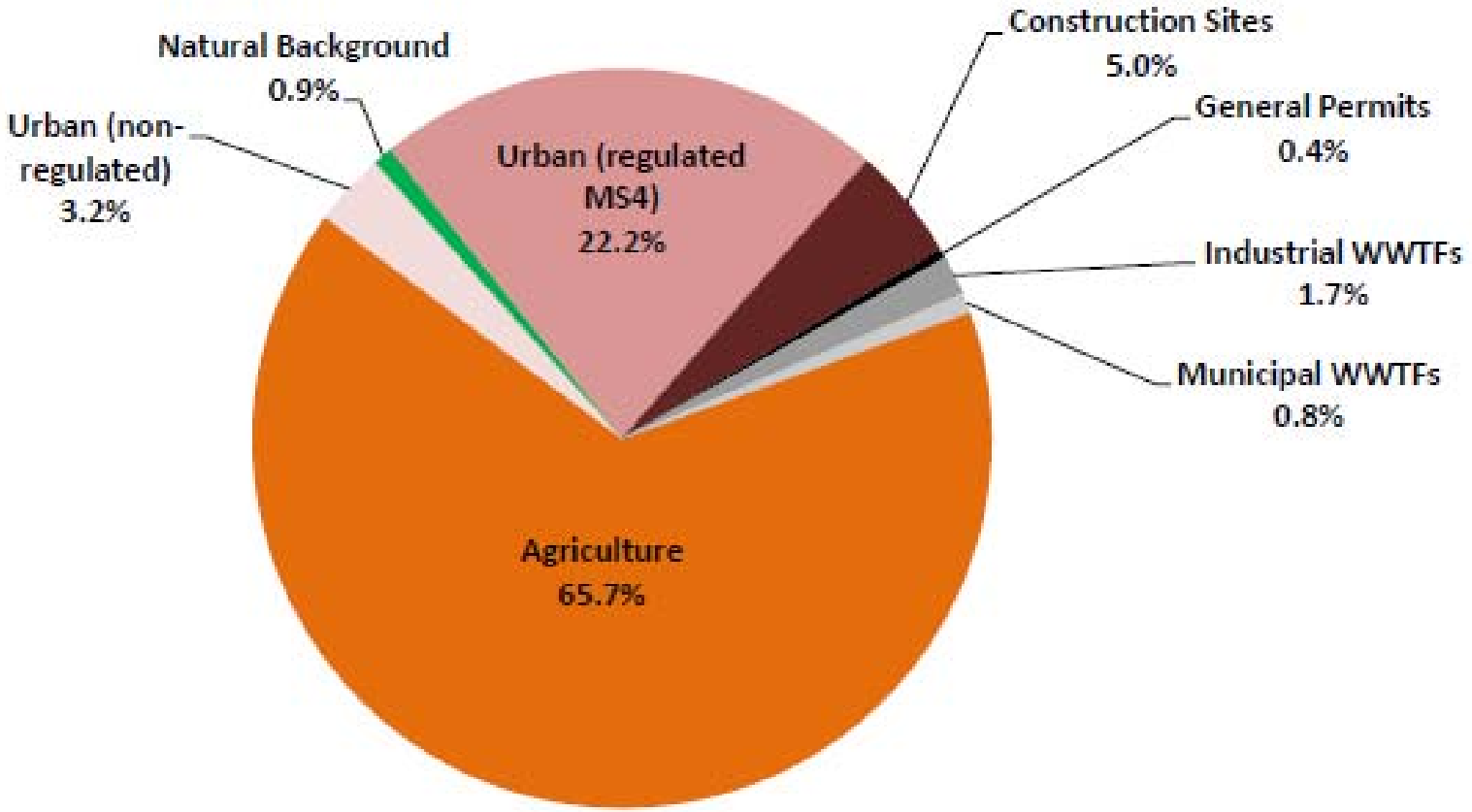


Figure 19. Sources of baseline TP loading in the LFR Basin

Total Phosphorus



gure 20. Sources of baseline TSS loading in the LFR Basin (excluding biotic solids)

Total Suspended Solids

IMPLEMENTATION

of Fox River Basin TMDL

int Sources (WLA)

WTFs (Industrial & Municipal)

Mechanism: write new effluent limit into their permit

Options:

- Optimization
- Construction
- Water Quality Trading
- Adaptive Management

int Sources (WLA)

MS4s – Municipal Separate Storm Sewer System…….aka urban runoff

chanism: write tmdl limit into their permit, as a % reduction

ions:

Construction of stormwater BMPs

Water Quality Trading

Adaptive Management

int Sources (WLA)

CAFOs – confined animal feeding operations… large farms

echanism: CAFO permit

ptions:

- BMPs
- Water Quality Trading
- Adaptive Management

int Sources (WLA)

Ps – General Permits

onmetallic mining, non-contact cooling water,
ormwater management, concrete, etc……..

chanism: could write into their permit, as a
% reduction in tmdl areas????

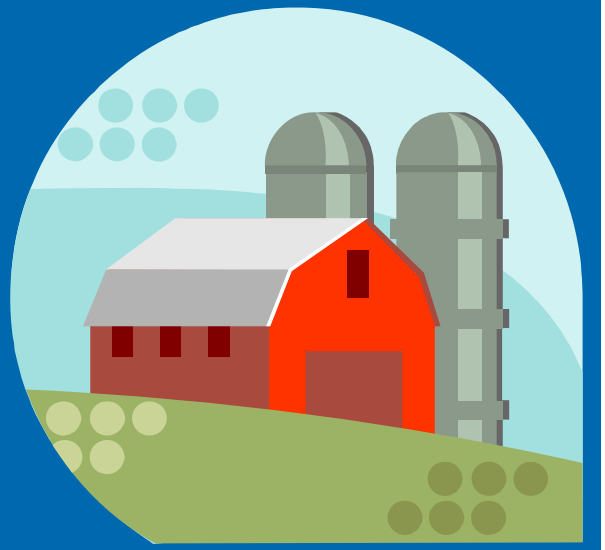
ner (WLA)

nregulated Urban

ackground (forest, wetlands..)

n-Point Sources (LA)

Agriculture



gulations: NR151 Etc…..

tions:

BMPs - structural and nonstructural

elivery: existing “infrastructure” – ATCP, LCDs, consultants, FSA, NRCS, NR

Water Quality Trading

Agriculture

Cropland

- Meet “T” (& pastures)
- Tillage Setback
- PI
- NMP

Livestock-Barnyard

- Manure storage
- Process wastewater
- Diversions in WQMA
- Manure Management Prohibitions

n-Point Sources (LA)

Agriculture

Tools - Resources

Consultants

County LWCDs

DATCP

NRCS

FSA

Non-government

DNR – CAFOs, TRM, NOD

n-Point Sources (LA)

Agriculture
Potential Issues

Drain Tile

Clay soils

PI . . . . . SWAT model

NMP

Agriculture
Additional

- Drainage Districts
- DATCP: working lands initiative (FPP);
- Livestock Siting
- Local Ordinances
- Cost sharing

“NEW” OPTIONS

Water Quality Trading

Adaptive Management

W OPTIONS

Water Quality Trading

Water quality trading is an exchange of pollutant reduction credits.

A buyer with a high pollutant control cost can purchase pollutant reduction or treatment from a willing seller.

Trading can produce substantial cost savings but must result in an improvement in water quality and a net reduction of the pollutant being traded.

Trading also can provide ancillary environmental benefits such as flood retention, riparian improvement and habitat.

Chapter 283.84

Point Source driven

W OPTIONS

Water Quality Trading

Ch 283.84

Pollutant parameters…. P, N, etc.

Voluntary Compliance option

Focused on achieving permit compliance

Allows point sources to work with nonpoint sources to reduce overall phosphorus loads so that **water quality criteria** can be attained (point source permit holder; funds) - upstream

Could be potential for larger scale

Trade ratios

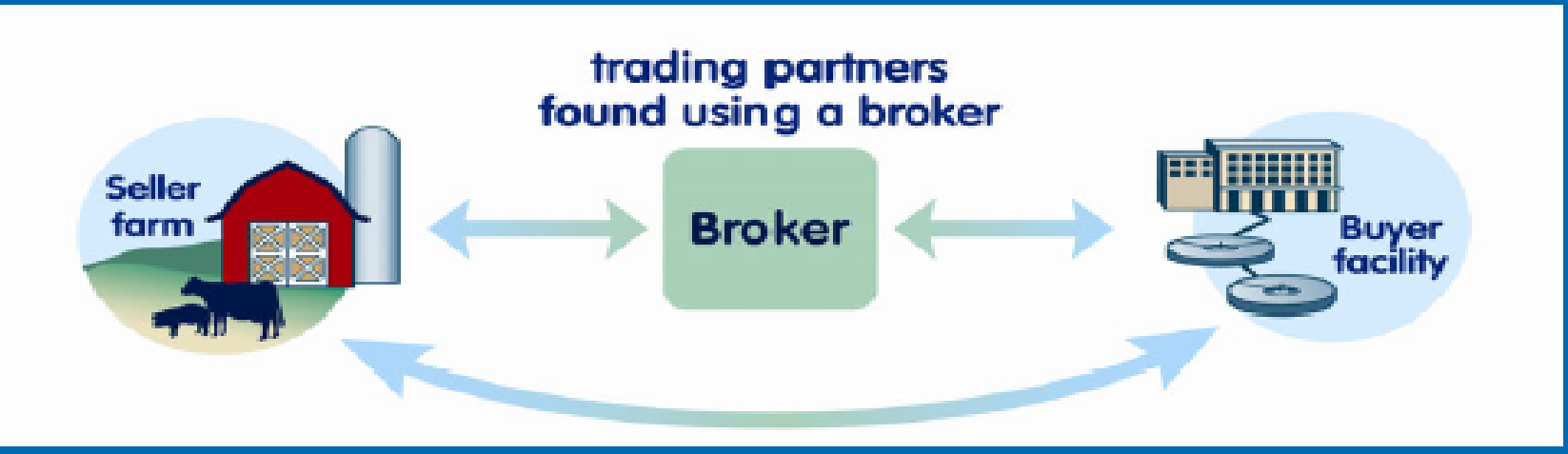
Trade Ratios

ertainty
- Based on effectiveness and ease of verification of the management practices employed.

very (distance between generator and user)
- TMDL – Same factors used in TMDL
- Non-TMDL – USGS SPARROW model for P, N and sediment

ivalency (form of pollutant)
- Not necessary with phosphorus
- Not yet specified for N and TSS (sediment)

Trade Administration



Agreements

W OPTIONS

Adaptive Management

NR 217.18 WAC
 only
oluntary Compliance option (not all point sources
ligible)
ocused on water quality improvements in
atershed - - have to perform in stream monitoring
llows point sources to work with nonpoint sources
o reduce overall phosphorus loads so that **water**
uality criteria can be attained (point source funds)

Example:

W OPTIONS

Adaptive Management

veloping
AM Plan

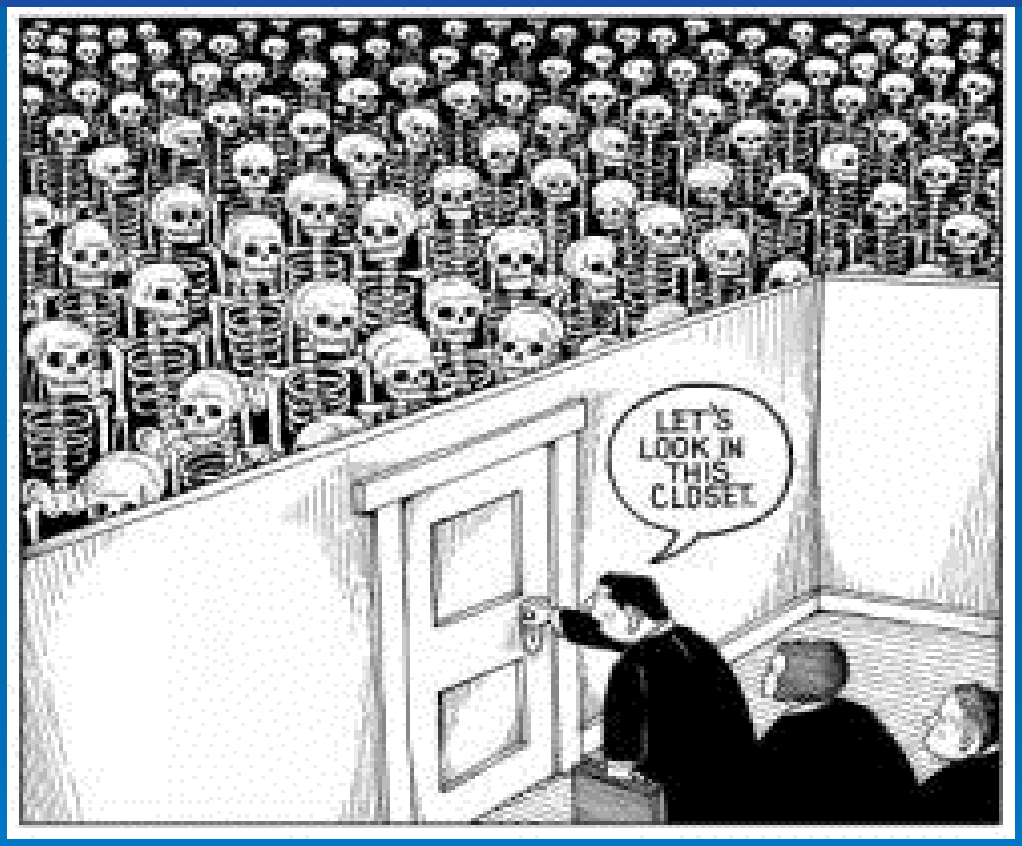
217.18(2)(d)

Step 1: Identify partners
Step 2: Describe the watershed and set load reduction goals
Step 3: Conduct a watershed inventory
Step 4: Identify where reductions will occur
Step 5: Describe management measures
Step 6: Estimate load reductions expected by permit term
Step 7: Measuring success - monitoring
Step 8: Financial security
Step 9: Implementation schedule with milestones

Differences between AM & Trading

	Adaptive Management	Trading
ollutants Covered	TP (and possibly TSS)	All pollutants except BCCs
nd Goals	Attaining the water quality criteria	Offsetting the limit
plementation Area	Watershed-focused	Upstream-focused
ffsets	No trade ratios	Trade ratios apply
ming	Implemented throughout the permit term	Generating credits before they can be used
-Stream Monitoring	Required	Not required
evel of ocumentation Needed	General watershed information	Field-by-field documentation

What is a TMDL?



A TMDL reveals the skeleton in the closet"

Dean Maraldo, EPA

Contact Information

ith Marquardt
DNR
5 E. County Road Y, Suite 700
hkosh, WI 54901

one 920/303-5435
ith.Marquardt@Wisconsin.gov

QUESTIONS ?

*Or visit **http://dnr.wi.gov** search*
"phosphorus rule"