

# Stormwater and TMDLs: Minnesota's Experience

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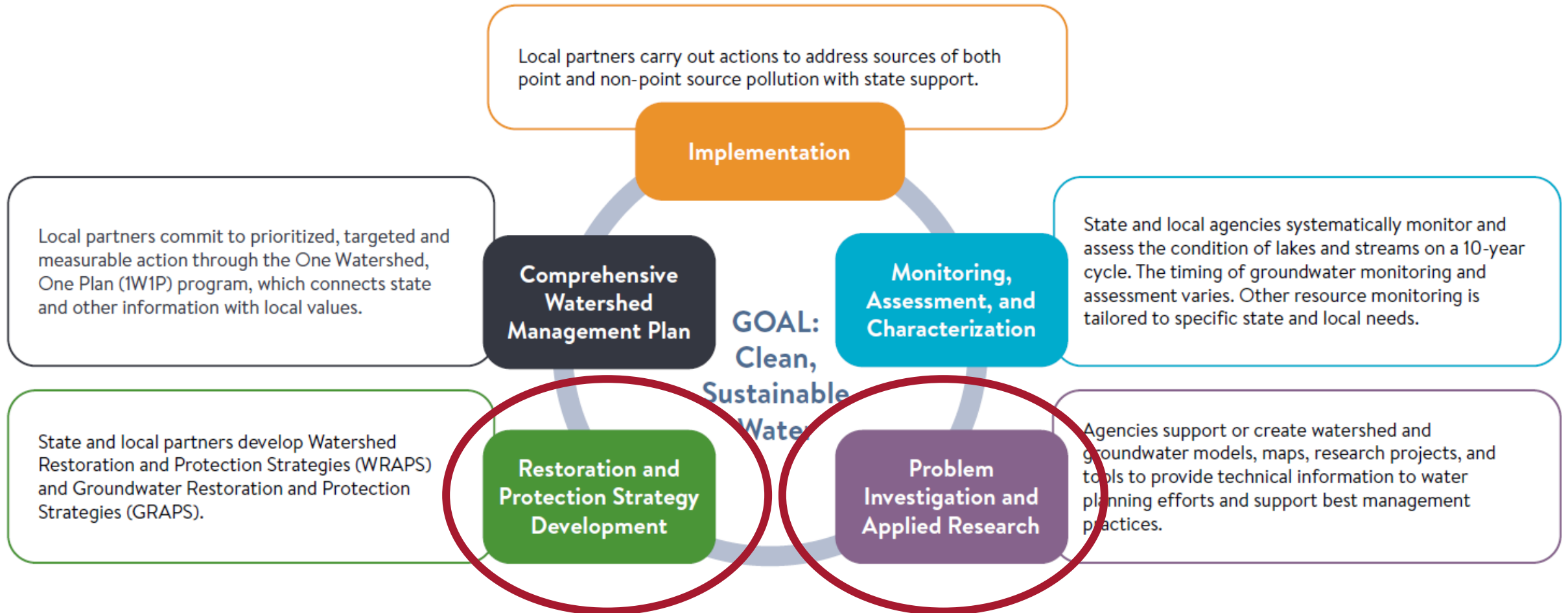
June 23, 2023

- TMDLs in MN
- MS4 general permits
- MS4 WLA calculation approaches
- Challenges with implementing current MS4 permit
- New approaches
- Next permit



# MN Water Management Framework

The framework connects state programs and local partners, encourages public participation, and uses the best available science to support decisions.

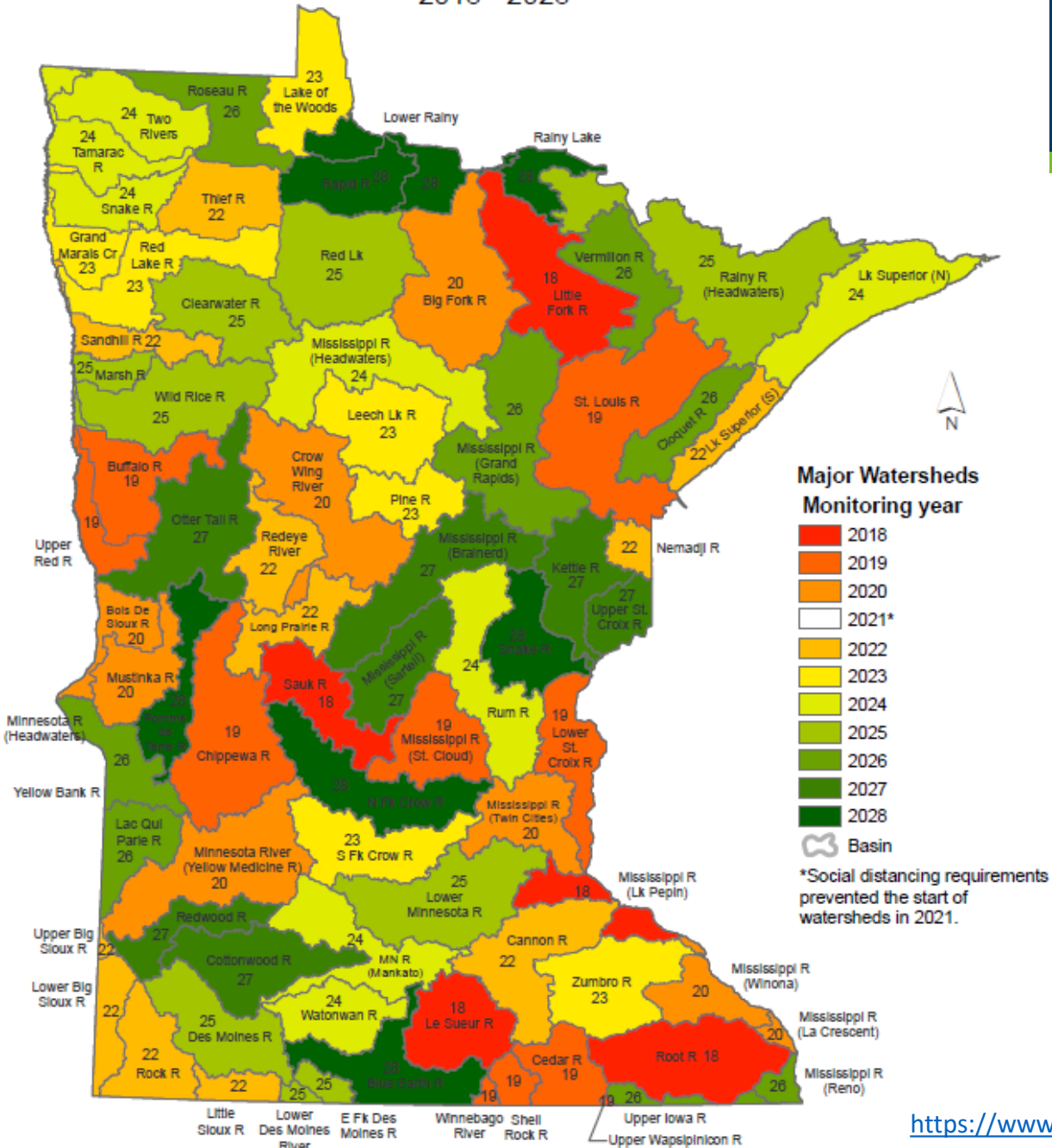


# Watershed Lake and Stream Monitoring Schedule

2018 - 2028

# MN Watershed Approach

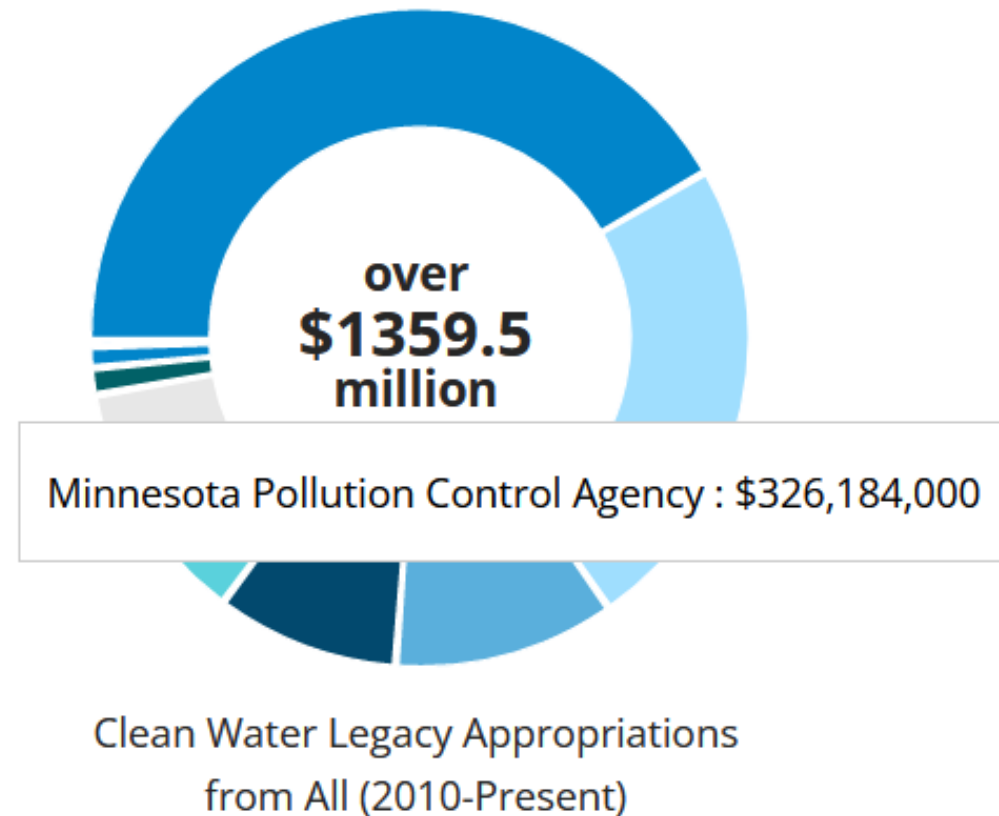
- 80 HUC8 (“major”) watersheds, 10-year cycle

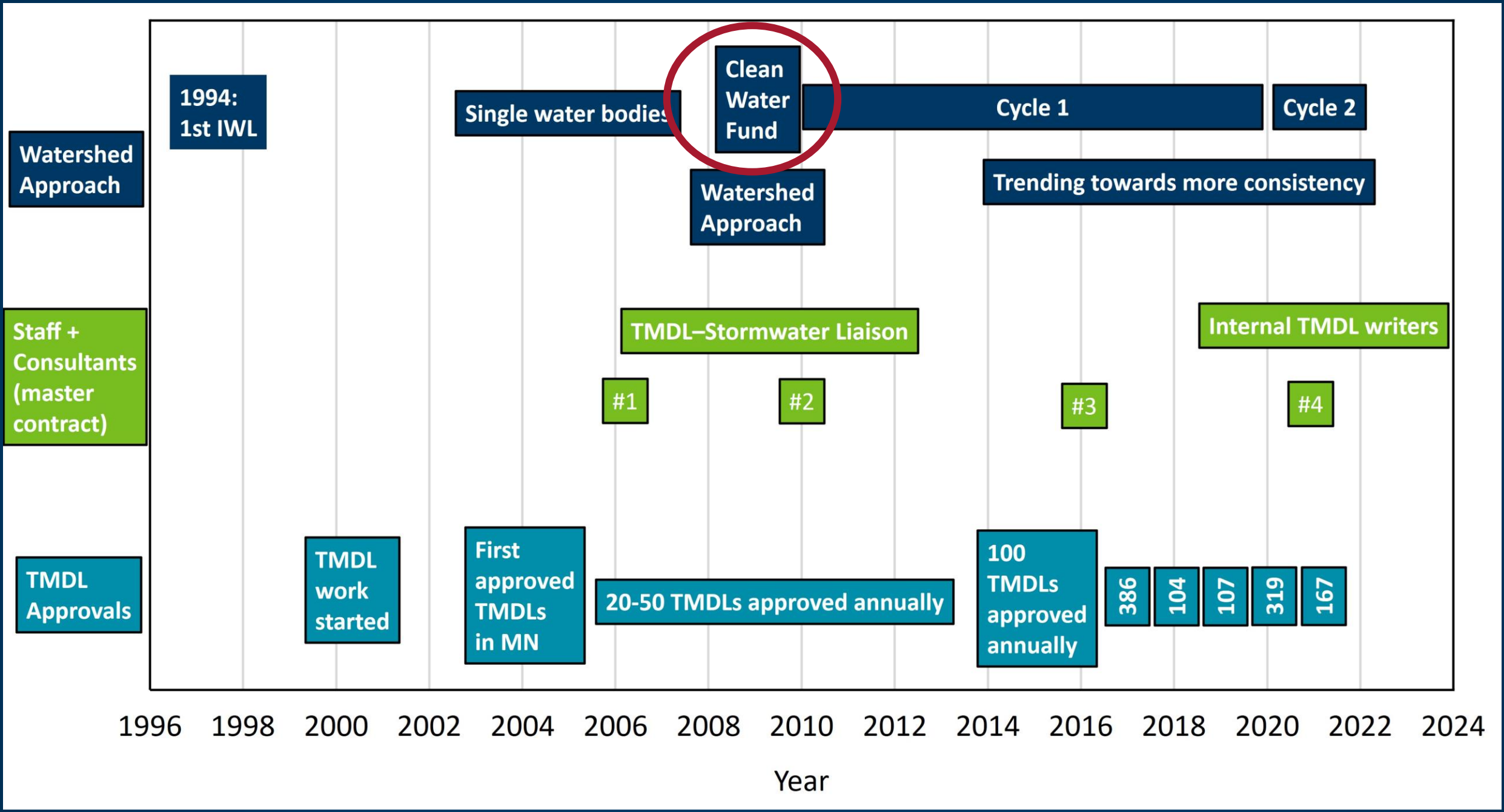


# MN Clean Water Fund



- Funded by 2008 amendment





1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020 2022 2024

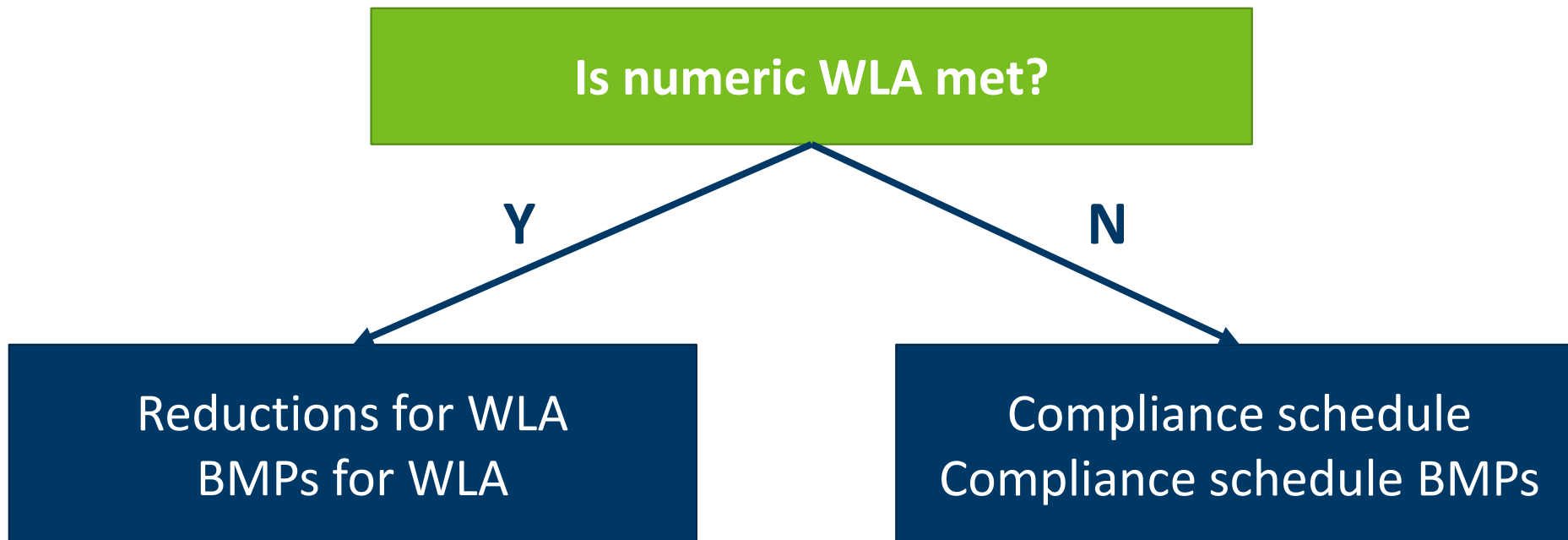
Year

# MS4 general permit history

	2006	2013	2020
# statewide approved TMDLs	48	339	1,576
# MS4s w/WLAs	~30	126	216
<b>WLA compliance approach</b>	Permittee checks 303(d) list, determines compliance, adjusts SWPPP as needed	MPCA provides WLA list spreadsheet; permittee lists WLAs, states whether meeting WLA; and lists BMPs (interim milestones as applicable)	<u>BMP implementation</u> : Bacteria, chloride, temperature <u>Numeric implementation</u> : TP, TSS, oxygen demand, nitrate

# 2020 permit application

- BMP implementation: Bacteria, chloride, temperature
- Numeric implementation: TP, TSS, oxygen demand, nitrate





# Why numeric limits based on WLA?

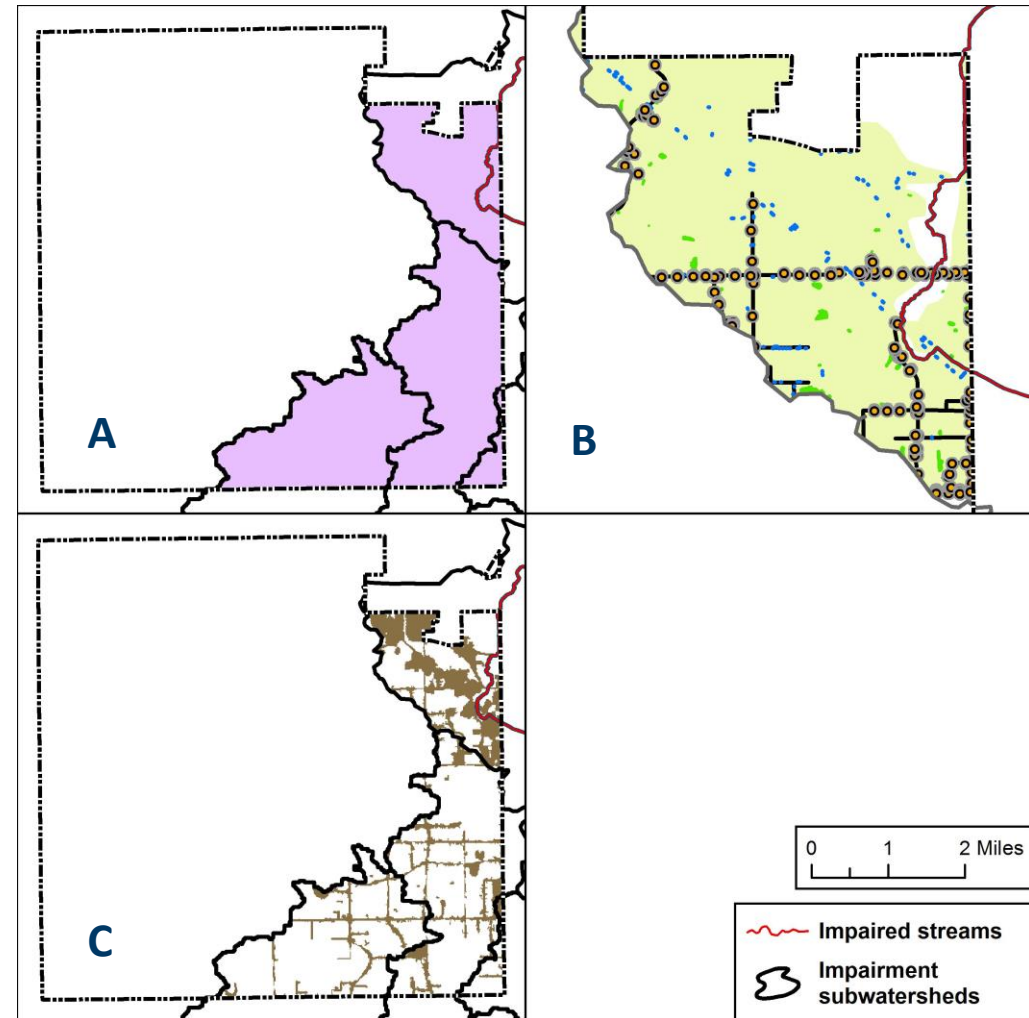
- Previous permits: not enough progress
- Numeric limits based on WLA to hold MS4s more accountable

Table 82. TSS TMDL summary, Porter Creek (07020012-817)

TMDL Parameter		Flow Zones				
		Very High	High	Mid-Range	Low	Very Low
		TSS Load (lbs/day)				
Loading Capacity		36,156	10,039	4,175	1,798	688
Unallocated Load		0	0	0	867	0
WLA	Total WLA	320	89	37	7.8	6.1
	Elko New Market City MS4 (MS400237)	162	45	19	4.0	3.1
	Construction Stormwater (MNR100001)	79	22	9.2	1.9	1.5
	Industrial Stormwater (MNR050000)	79	22	9.2	1.9	1.5
Load Allocation		34,028	9,448	3,929	833	648
MOS		1,808	502	209	90	34

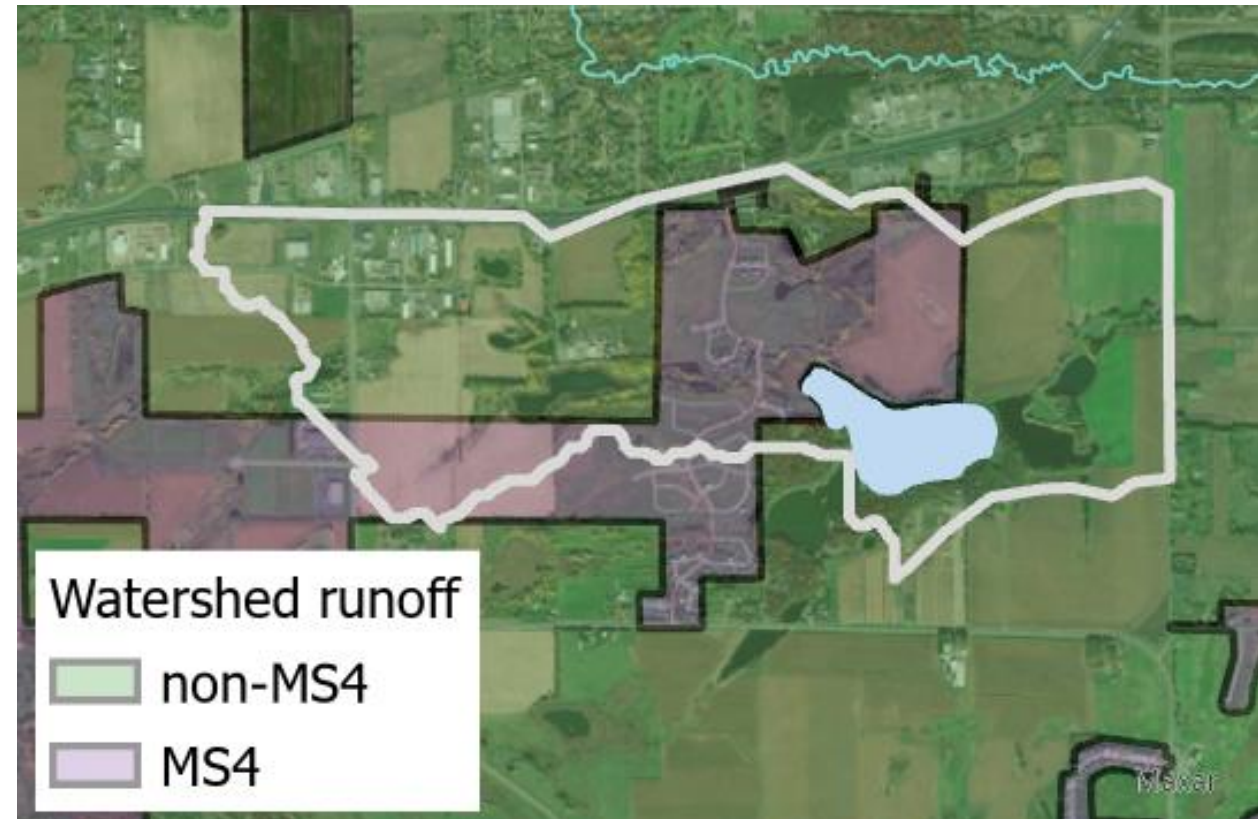
# Approaches to delineating MS4-regulated areas

- Cities and townships
  - A. Entire jurisdictional area**
  - B. Delineating area as watershed to regulated stormwater conveyance**
  - C. Approximate with land cover data: impervious or developed area**
- Linear MS4s (road authorities)
  - Mapped by MnDOT
  - **Approximate right-of-way width of roads applied to GIS road (line) layers**



# Approaches to developing MS4 WLAs

- **Area**
- Concentration target in runoff
- Model scenario



# Challenges with implementing current MS4 permit

- Unachievable WLAs
- MS4 boundaries
- Overlapping WLAs

# Unachievable WLAs

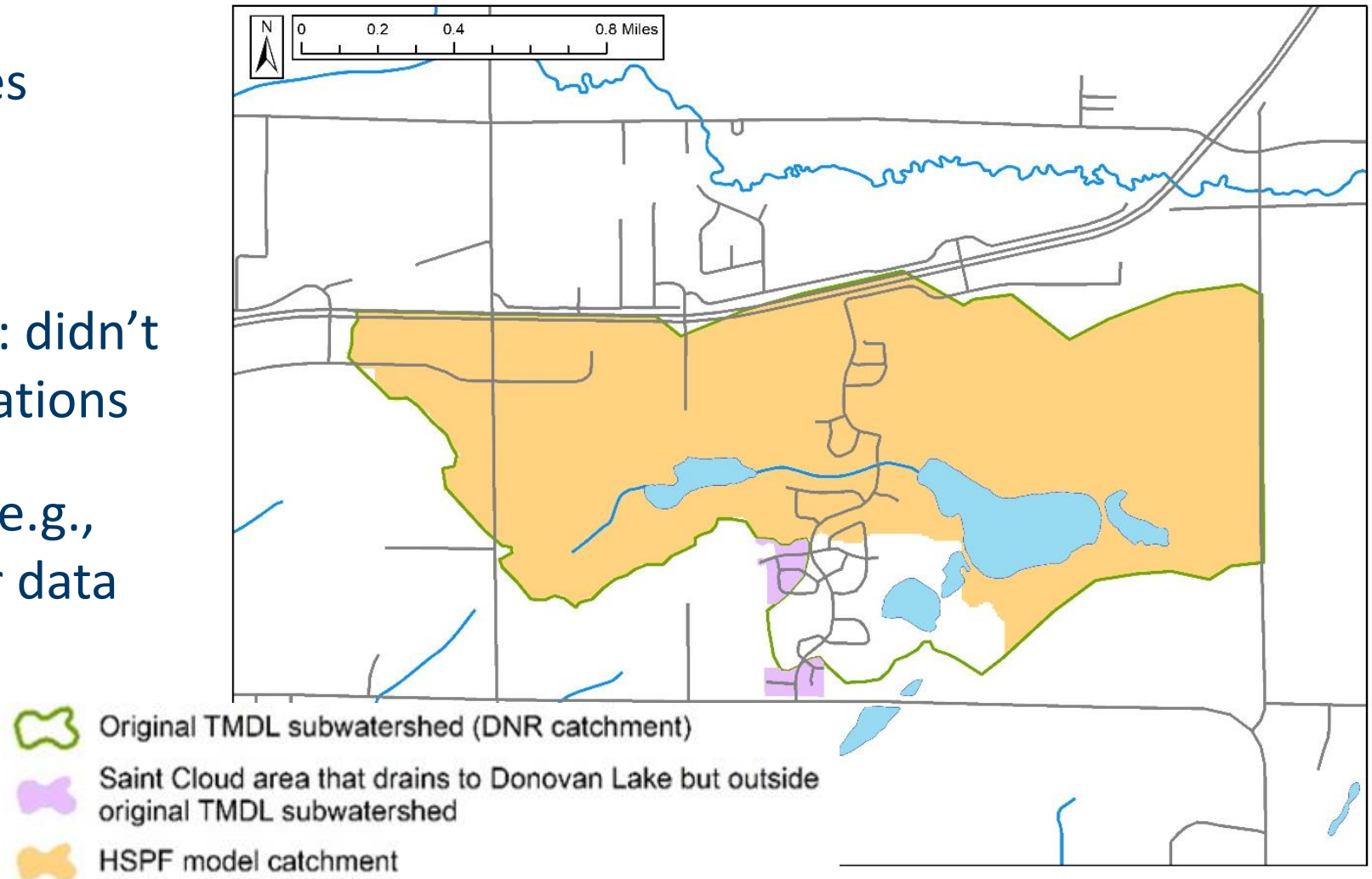
TMDL Parameter		Flow Regime				
		Very High (37–1,128 cfs)	High (6–37 cfs)	Mid-Range (3–6 cfs)	Low (0.6–3 cfs)	Very Low (0.1–0.6 cfs)
		TSS Load (lbs/day)				
Waste Load Allocation	Duluth City MS4 (MS400086)	198	38	12	3.9	1.0
	Rice Lake City MS4 (MS400151)	181	35	11	3.6	1.0
	St. Louis County MS4 (MS400158)	8.3	1.6	0.50	0.16	0.044
	Industrial Stormwater (MNR050000) <sup>a</sup>	65	12	3.9	1.3	0.34
	Construction Stormwater (MNR100001) <sup>a</sup>	33	6.2	2.0	0.64	0.17
Load Allocation		2,765	527	167	54	15
MOS		361	69	22	7.1	1.9
<b>Loading Capacity</b>		<b>3,611</b>	<b>689</b>	<b>218</b>	<b>71</b>	<b>19</b>
Existing Load		270,118	11,599	387	17	-
Percent Load Reduction		99%	94%	44%	0%	-

- Permitted MS4s assigned WLAs
- High percent load reduction needs
- Channel erosion not allocated a load

Contested case  
hearing petition filed  
during public notice

# MS4 boundaries

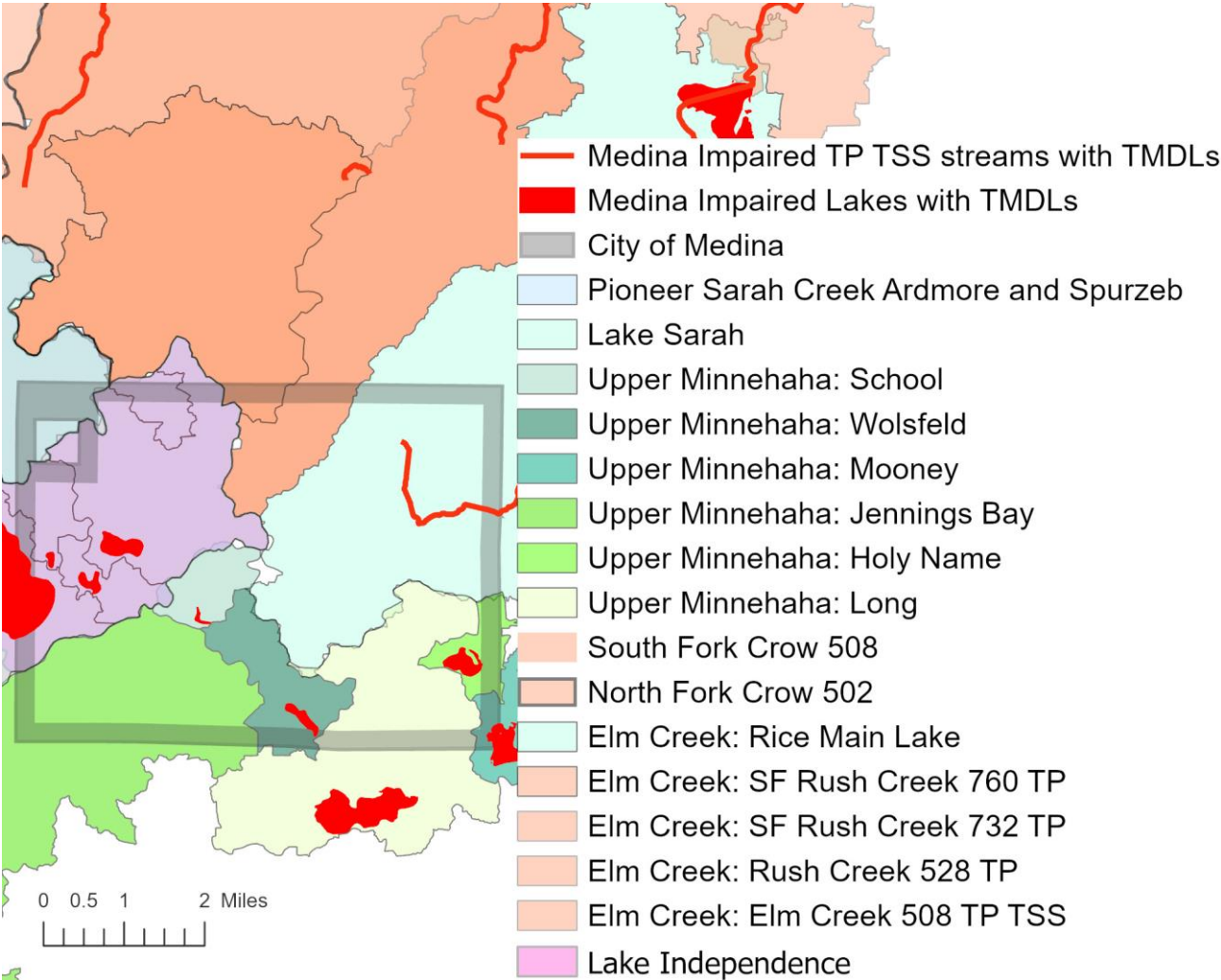
- Changing MS4 boundaries (development changes watershed boundaries)
- Incorrect in TMDL report: didn't consider stormsewer locations
- Unclear in TMDL report (e.g., scale of maps, land cover data as "boundary")



# Overlapping WLAs

- Multiple TMDLs for different water bodies at different scales.

**TSS and TP WLA study areas for one municipal MS4**



# Recent WLA approach: Runoff concentration target

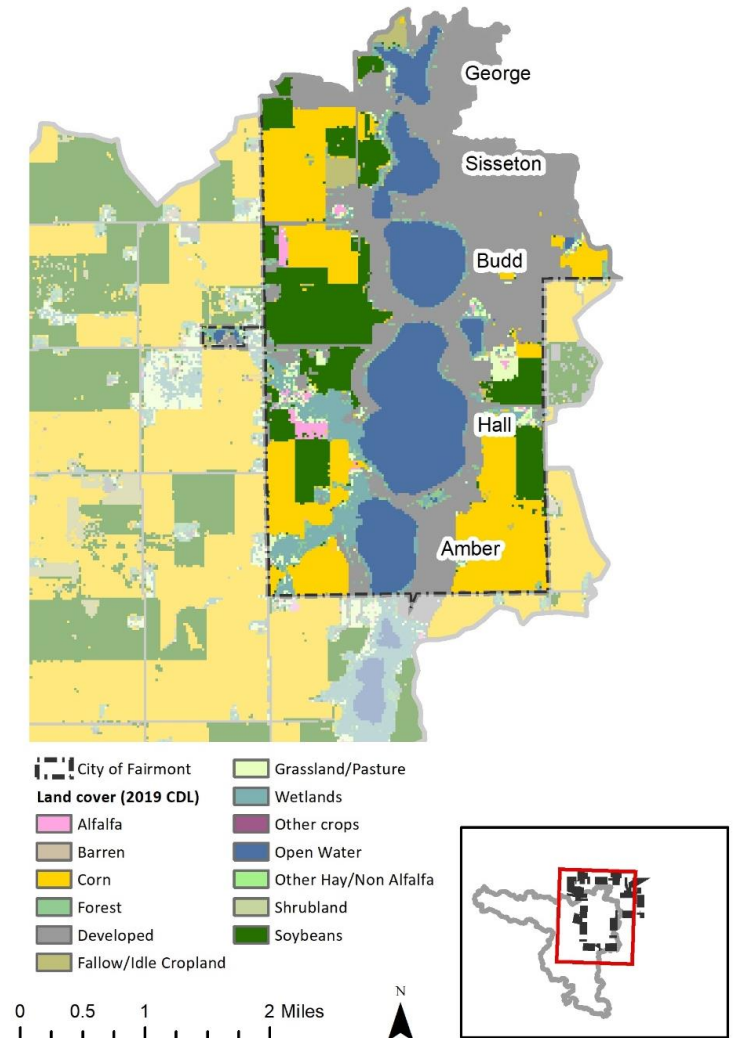
- In addition to load, express WLA either as concentration or unit area load (export coefficient)

Table 22. Permitted MS4 WLA for phosphorus.

MS4 name and permit number	Estimated regulated area (ac) <sup>a</sup>	Estimated regulated percent area of the watershed	Impaired water body	Impaired water body AUIDs	Phosphorus wasteload allocation (lb/season)	Target watershed runoff phosphorus concentration (µg/L)
City of Fairmont (MS400239)	5,095	19%	Fairmont Chain: Amber, Hall, Budd, Sisseton, George	46-0034-00 46-0031-00 46-0030-00 46-0025-00 46-0024-00	1,855 <sup>b</sup>	183

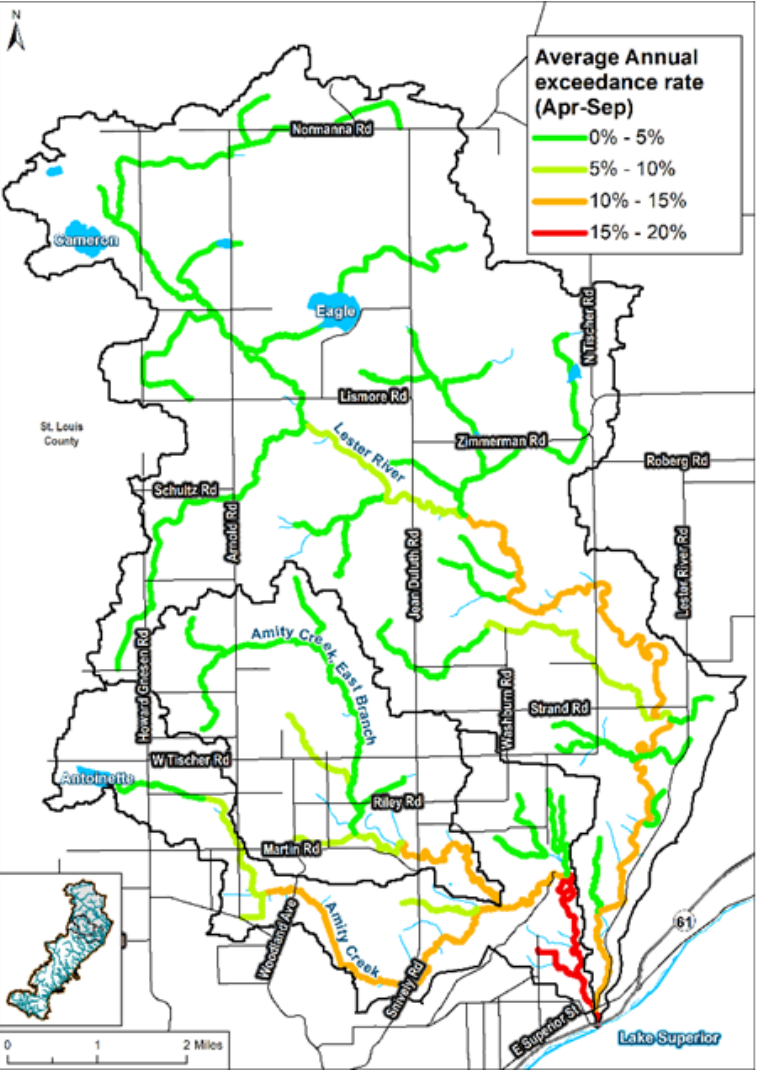
a. Does not include surface area of impaired lakes.

b. Assumes a TP watershed runoff concentration of 183 µg/L.



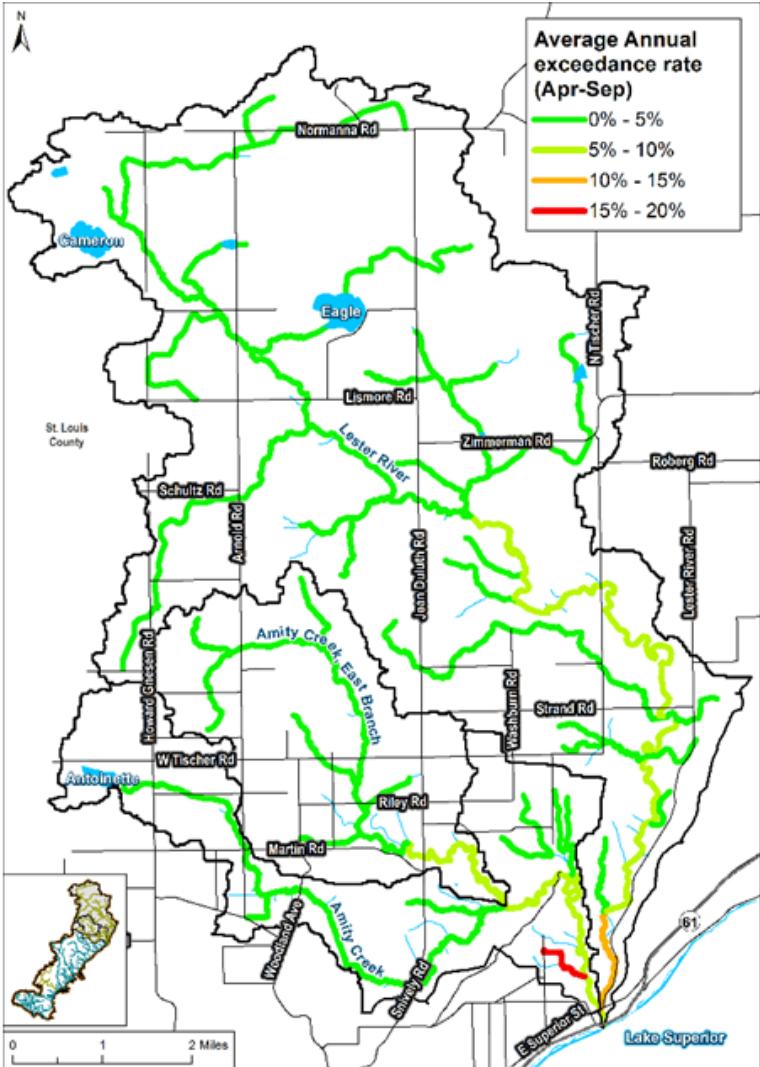


# Recent WLA approach: Percent reductions from HSPF model scenario



Baseline

60% reduction in TSS from developed land and near-channel sources



# Moving forward

- What should the next permit look like?
  - BMP-based (state-wide) for more pollutant types?
  - Stick with current approach?



# Thank you!

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