

SLAMM Urban Runoff Model

WinSLAMM - [Land Use Model]

File Current File Data Pollutants Tools Run Utilities Help

RES INS COM IND CU FRE GS CB WP BF MF

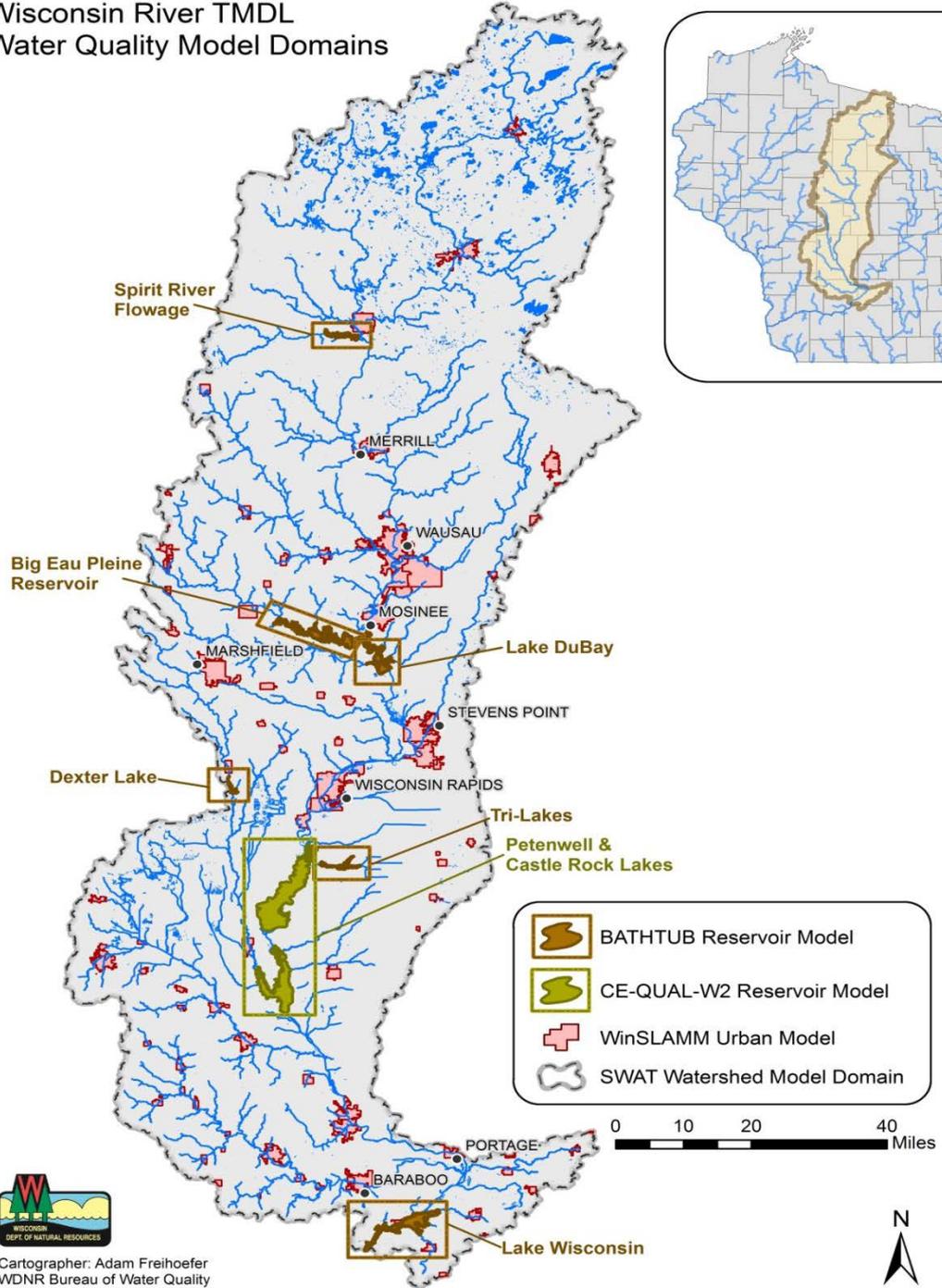
Element Name:

Source Area #	Source Area	Area (acres)	Source Area Parameters	First Control Practice	Second Control Practice
Roofs					
1	Roofs 1			▼	▼
2	Roofs 2			▼	▼
3	Roofs 3			▼	▼
4	Roofs 4			▼	▼
5	Roofs 5			▼	▼
6	Roofs 6			▼	▼
7	Roofs 7			▼	▼
8	Roofs 8			▼	▼
9	Roofs 9			▼	▼
10	Roofs 10			▼	▼
11	Roofs 11			▼	▼
12	Roofs 12			▼	▼
Parking					
13	Paved Parking 1			▼	▼
14	Paved Parking 2			▼	▼
15	Paved Parking 3			▼	▼
16	Paved Parking 4			▼	▼
17	Paved Parking 5			▼	▼
18	Paved Parking 6			▼	▼
19	Unpaved Parking 1			▼	▼
20	Unpaved Parking 2			▼	▼
21	Unpaved Parking 3			▼	▼



- Predicts stormwater flows and associated pollutant load generation and attenuation from urban areas
- SLAMM output data will be incorporated into SWAT model as **MONTHLY** point source loads

Urban Runoff Model Domain



Model Domain Terminology:

Urban Model Area vs: Urbanized Area

Urban model Area

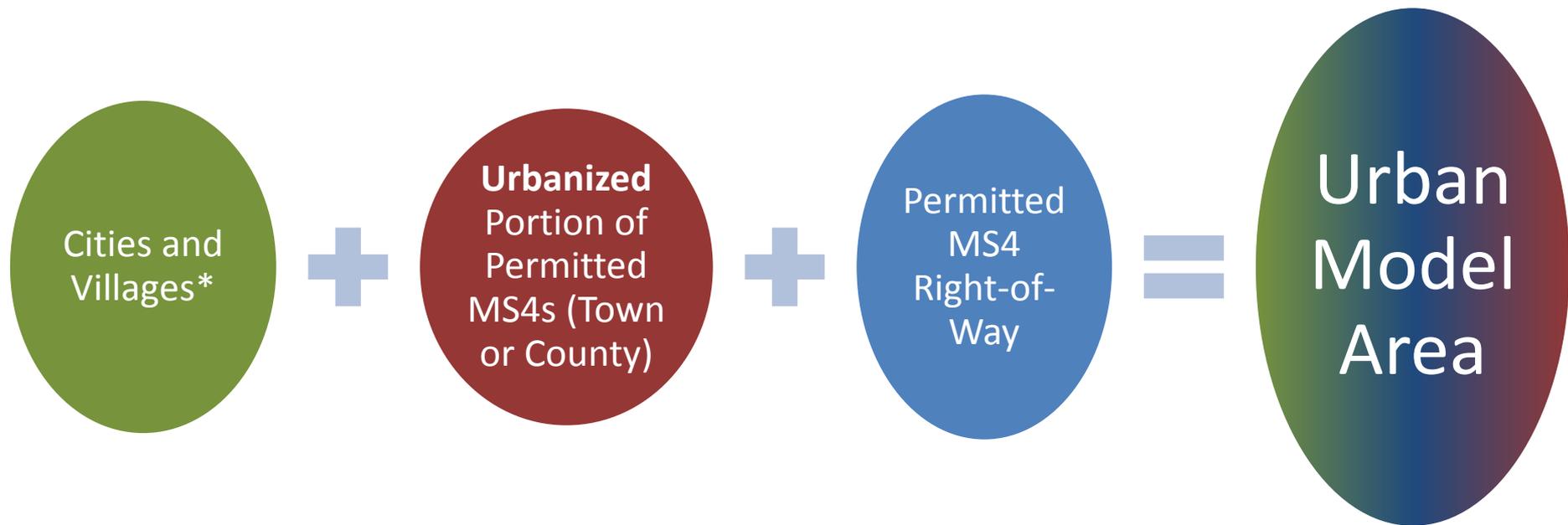
- The portion of the study area modeled in SLAMM, comprised of:
 - Cities and villages, excluding any large, non-urbanized undeveloped areas within city/village limits,
 - Urbanized areas within townships that have a permitted MS4.



Urbanized area

- Area classified as “urbanized” by the 2010 Decennial Census.

Urban Model Area



** Excluding significant areas of undeveloped and/or agricultural lands*

Model Load Terminology: TSS Load Types

No Controls

- Discharged from urban model area **with no stormwater controls**

Existing Conditions

- Discharged from urban model area **with existing stormwater controls**

Baseline Conditions

- Discharged from urban model area **with stormwater controls that achieve the 20% TSS reduction required by NR 151**

Model Load Terminology: TSS Load Types

Permitted
MS4s

no
controls \neq

existing
conditions \neq

baseline
conditions

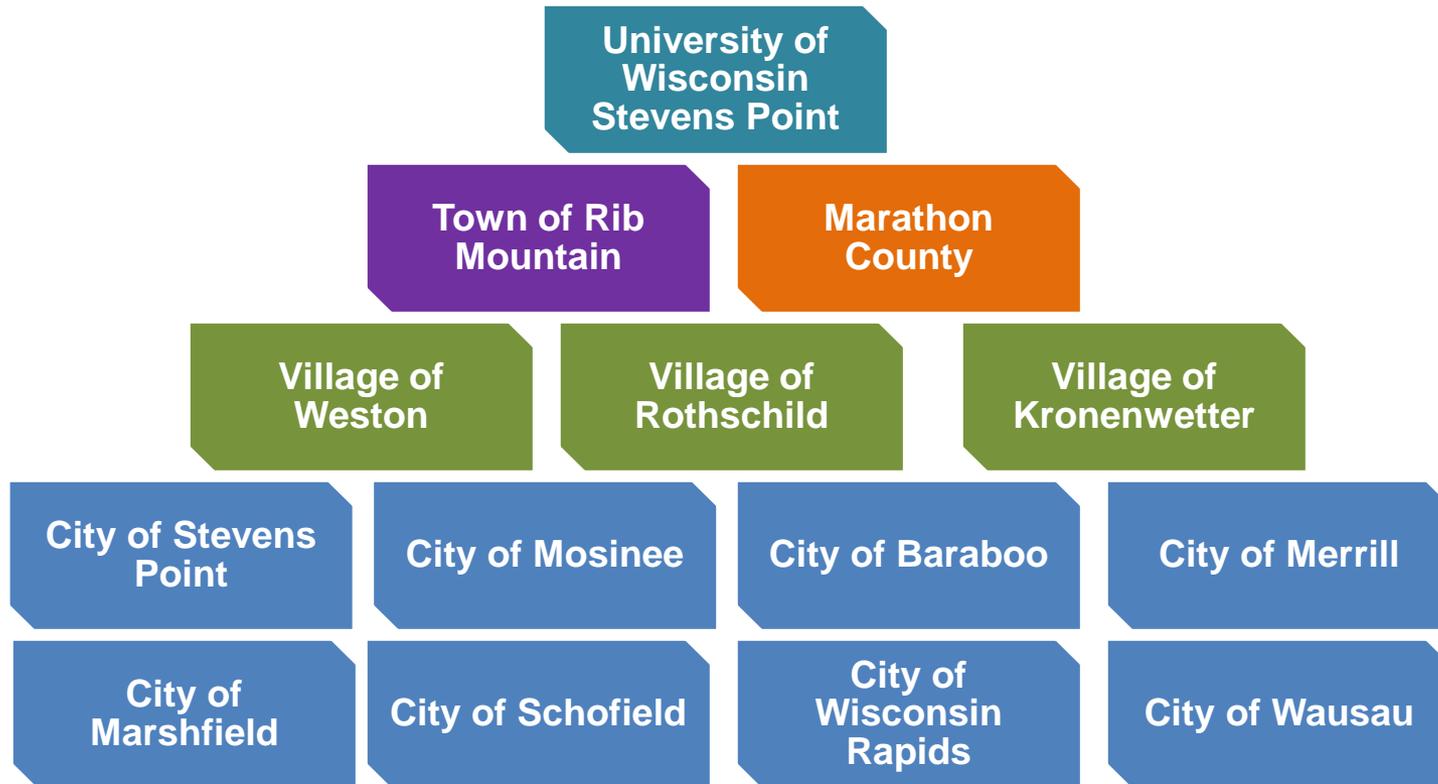
Unpermitted
Areas

no
controls $=$

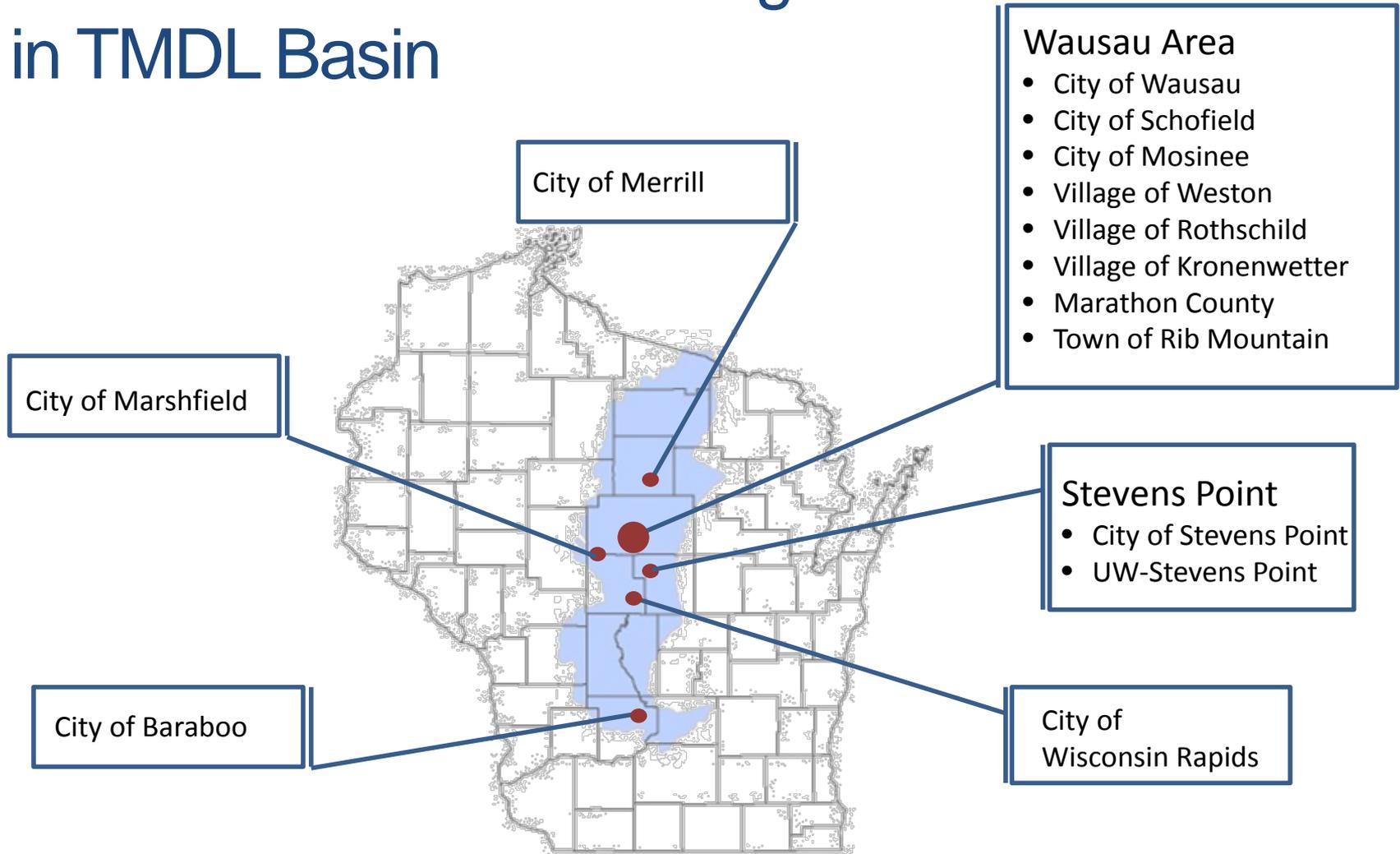
existing
conditions $=$

baseline
conditions

MS4s with Permit Coverage in TMDL Basin



MS4s with Permit Coverage in TMDL Basin



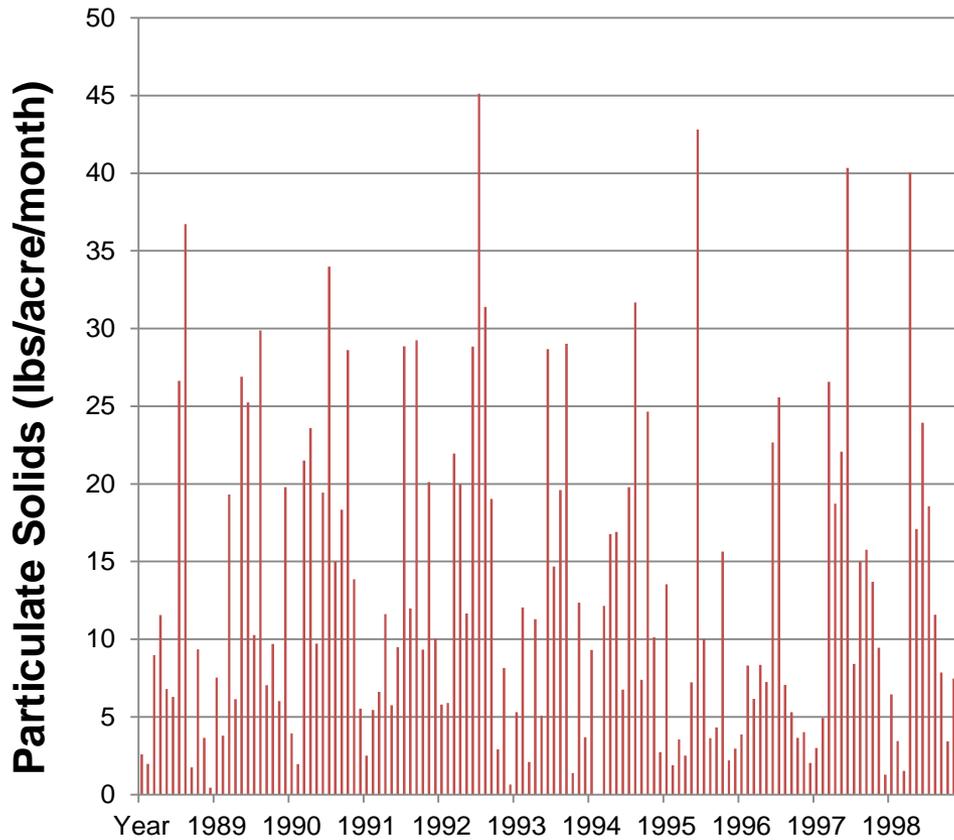
SLAMM Modeling for TMDL

Why don't you just use the loads from permitted MS4 reports?

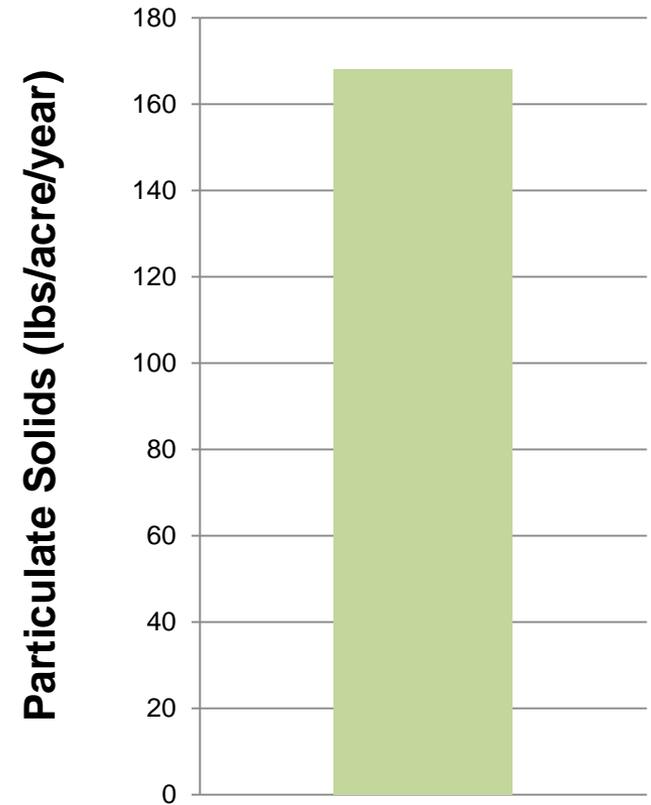
	NR 151	TMDL Development
Area Modeled	Regulated Area Only	Entire City/Village
Land Use Conditions	2004	Current
Model Timeframe	1- or 5- years,	12-years
Winter Season Loading	No	Yes
Load Outputs	Average Annual (1981)	Monthly averages for 2002-2013

SLAMM Output Data

TMDL

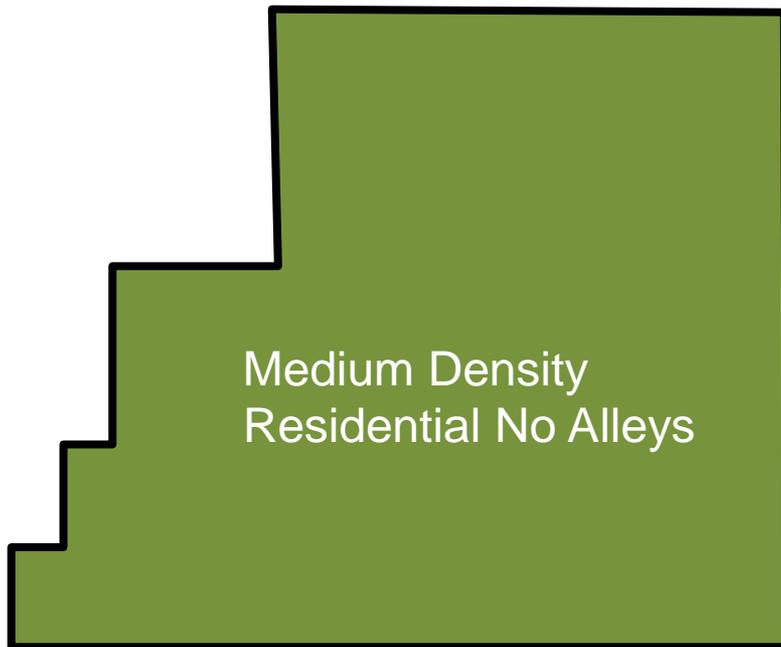


NR 151

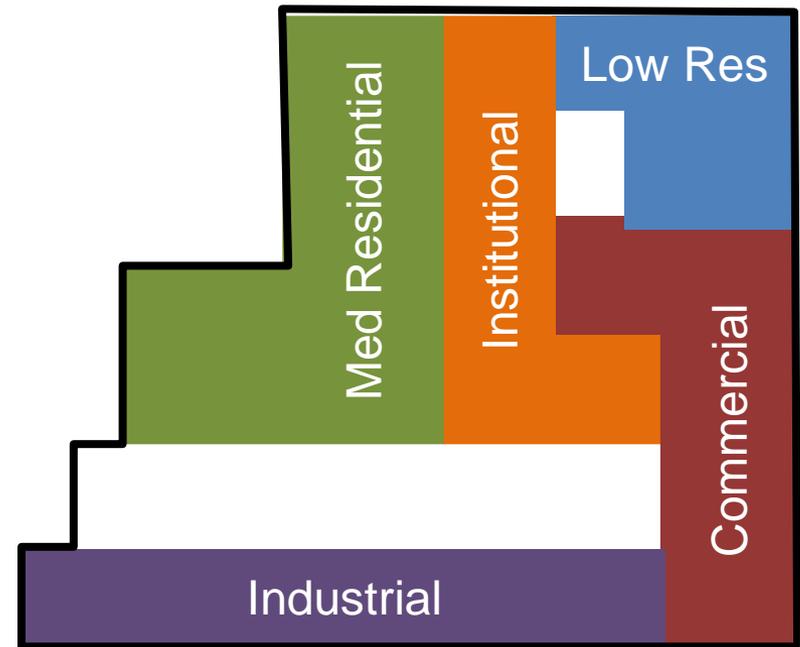


SLAMM Modeling for TMDL

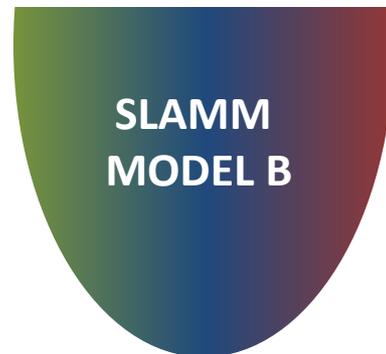
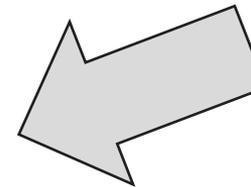
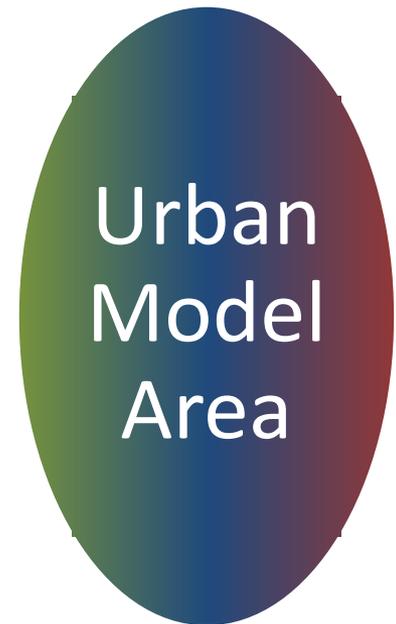
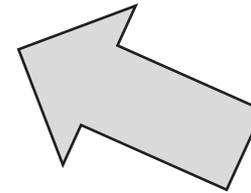
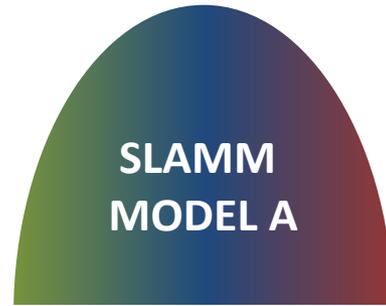
TMDL Development
Load per-unit-area load approach



TMDL Implementation
Detailed Approach



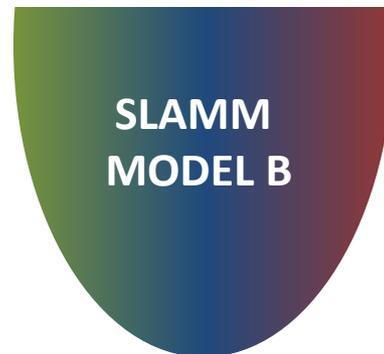
Urban Model Area



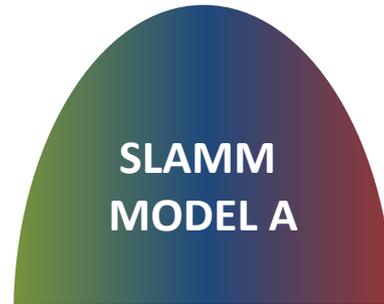
Urban Model Area



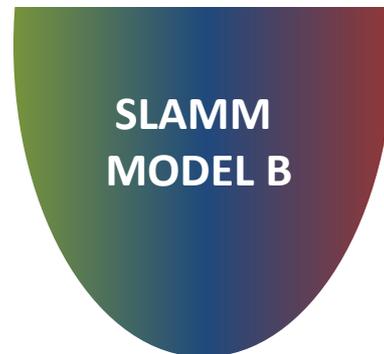
- Permitted MS4 Cities and Villages
- Urbanized Area of other Permitted MS4s



Urban Model Area



- Permitted MS4 Cities and Villages
- Urbanized Area of other Permitted MS4s



- Unpermitted Cities and Villages

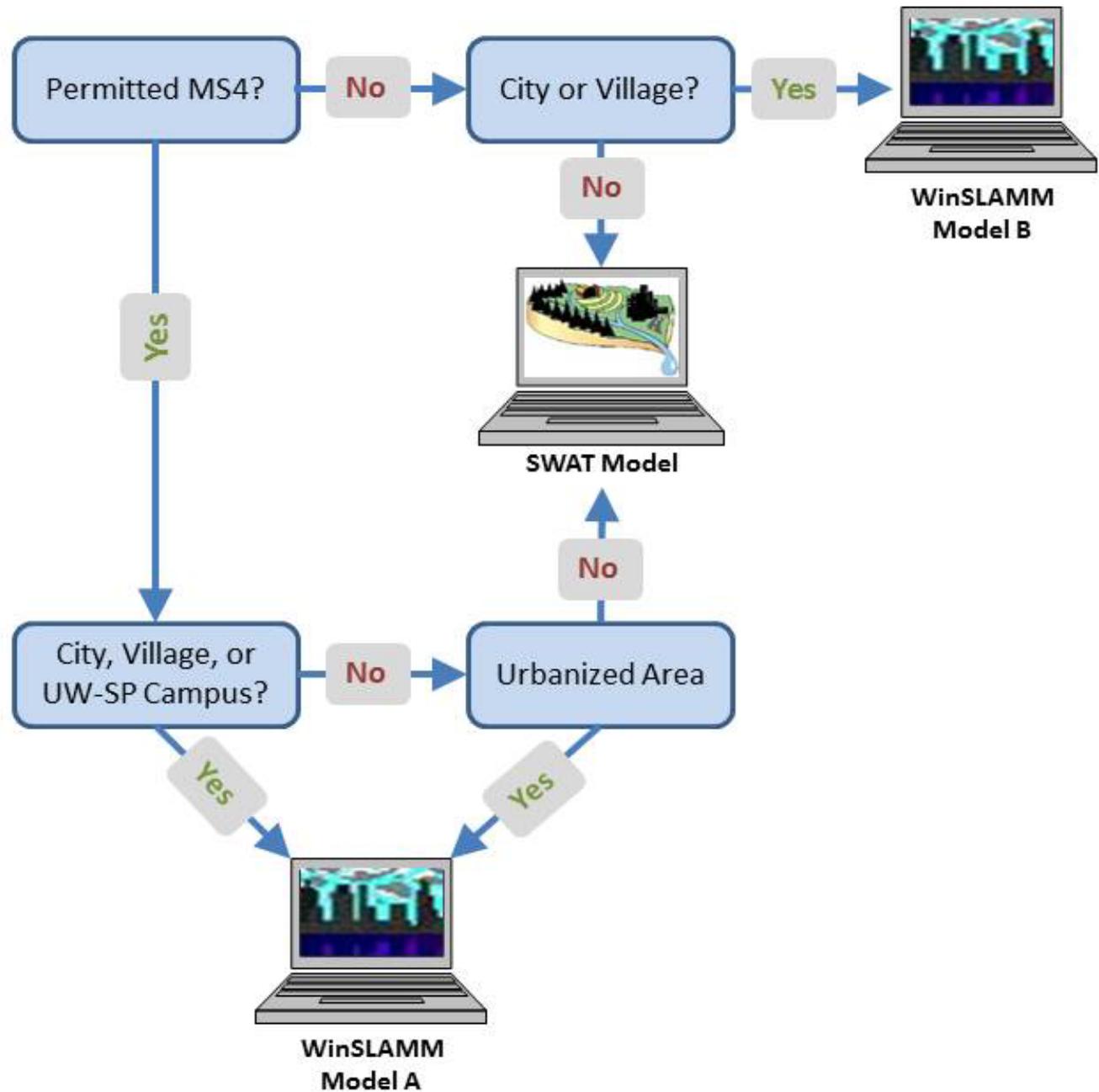
WinSLAMM Models A & B

	Standard Land Use	Drainage
WinSLAMM Model A (Permitted MS4s)	Medium Density Residential No-Alleys	Storm sewer w/ curb and gutter
WinSLAMM Model B (Unpermitted Areas)		Swale drainage

WinSLAMM Models A & B

	Standard Land Use	Drainage	Existing Conditions	Baseline Conditions
WinSLAMM Model A (Permitted MS4s)	Medium Density Residential No-Alleys	Storm sewer w/ curb and gutter	Reduce by existing reduction rate	Reduce TSS loads by 20%, and TP load by equivalent amount
WinSLAMM Model B (Unpermitted Areas)		Swale drainage	No reduction	No reduction

Delineating Urban Model Areas



Survey Q&A

- The straight use of Census Bureau Urbanized Area definitions can be problematic. Those definitions are based on population density, so areas with extensive commercial or industrial development but little residential area could potentially show up as non-urbanized. I recommend looking overlaying the UA on an aerial photo in GIS and considering modifying the boundaries.
- Soils that are X/D should be classified in WinSLAMM as /D, not as X, unless they are drain tiled. Have you contacted municipalities with X/D soils to ask if the soils are drain tiled?
- I am not certain if rainfall data identifies heavy rains (greater than 1 inch rainfall within 6 hours = severe runoff) vs. rainfall by average annual values.

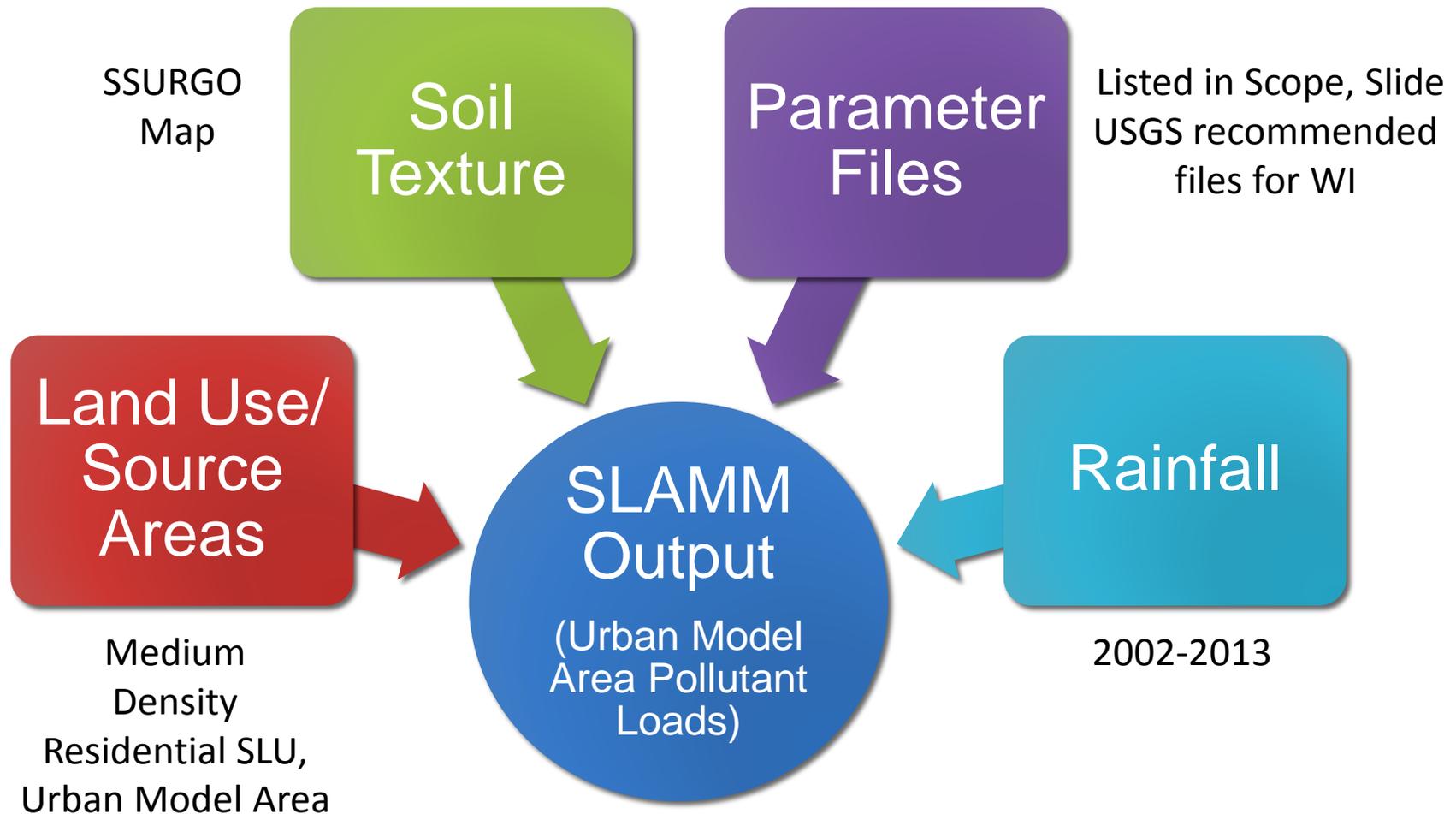
Survey Q&A (cont'd)

- WinSLAMM assumptions include that non-permitted municipalities have swale drainage and permitted MS4's are curb/gutter. What is this based on?
- How will outcomes from the WDNR TMDL Stormwater Guidance document be integrated into this project?
- Specific examples of model inputs (how load rates are calculated, specific factors, etc.)
- Please address why models already developed by MS4 urbanized areas are not going to be used or at least reviewed to verify potential difference between the new model developed with this study.

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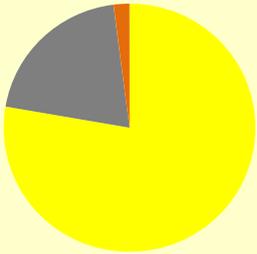
SLAMM Urban Runoff Model



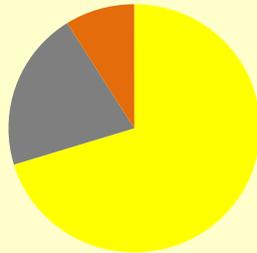
Permitted MS4 Soil Texture



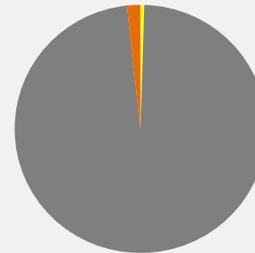
Wisconsin Rapids



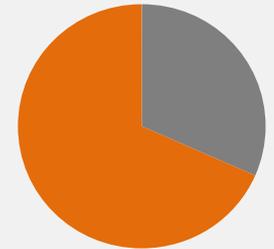
Schofield



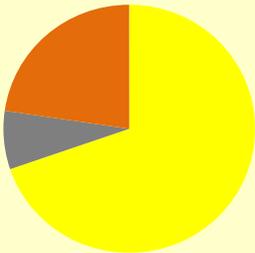
Baraboo



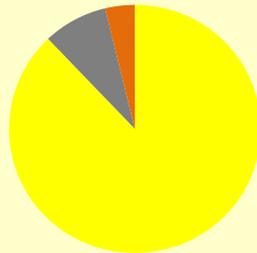
Marshfield



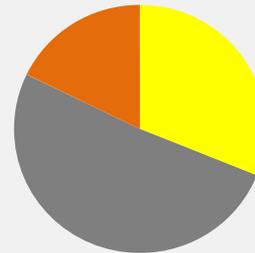
Stevens Point



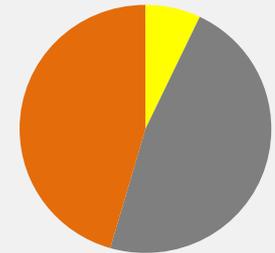
Kronenwetter



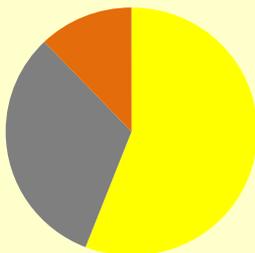
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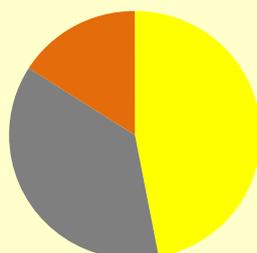
Merrill



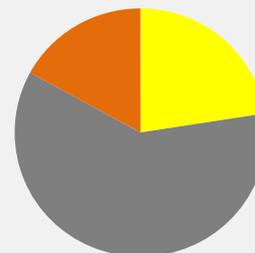
Rothschild



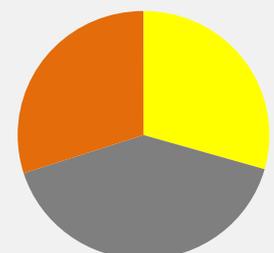
Rib Mountain



Mosinee



Weston



SLAMM Parameter Files

File Type	File Name
Pollutant Probability Distribution File	WI_GEO02.ppd
Runoff Coefficient File	WI_SL06 Dec06.rsv
Particulate Solids Concentration File	Wi_avg01.psc
Particulate Residue Delivery File	Wi_dlv01.prr
Street Delivery File	WI_Res and Other Urban Dec06.std
Particle size distribution	NURP.cpz

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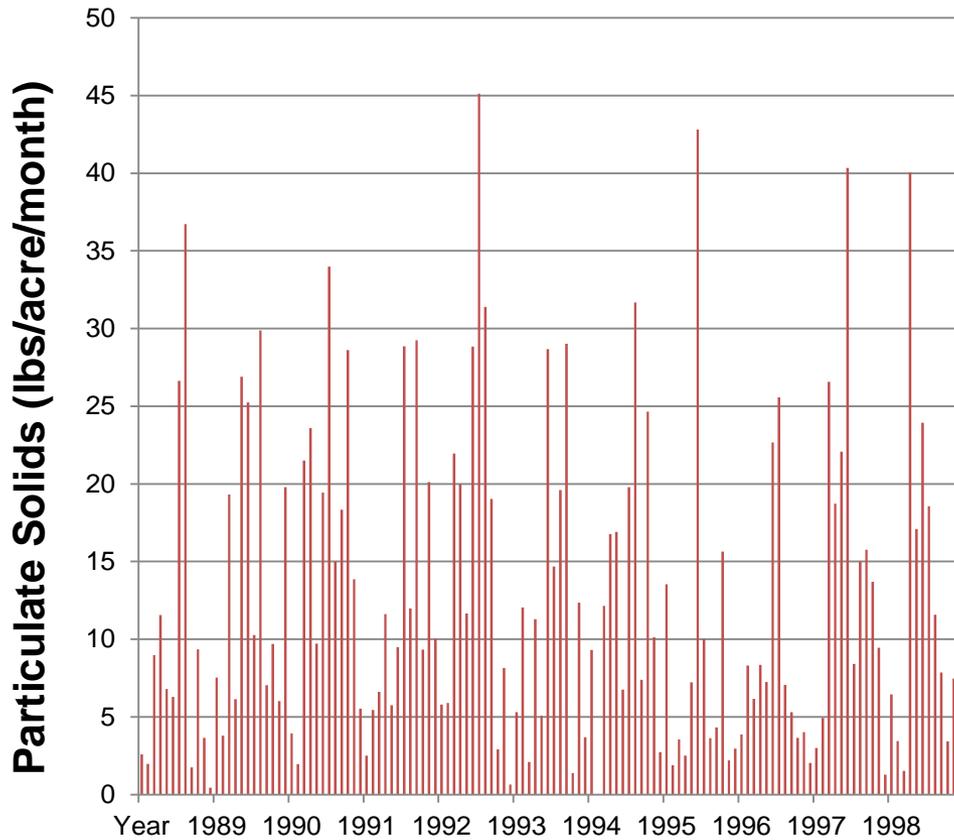
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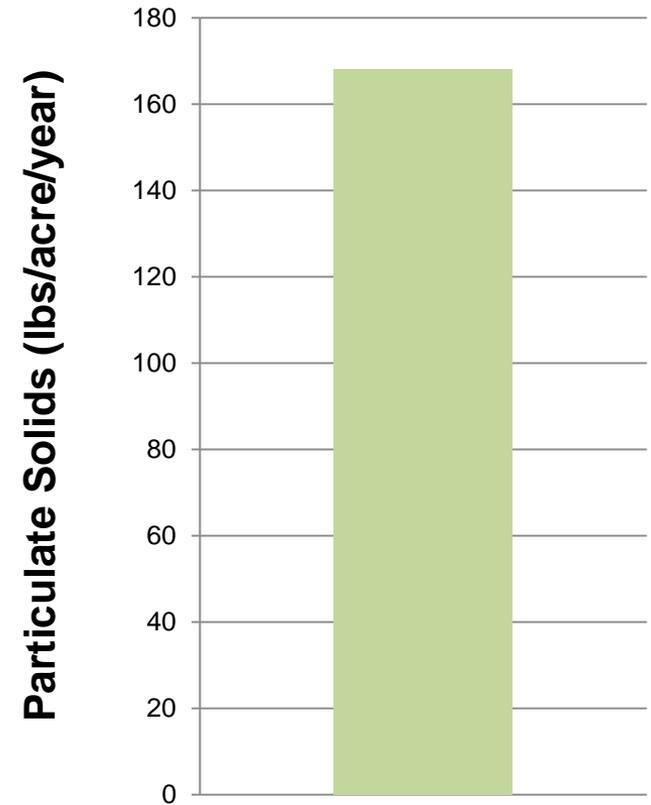
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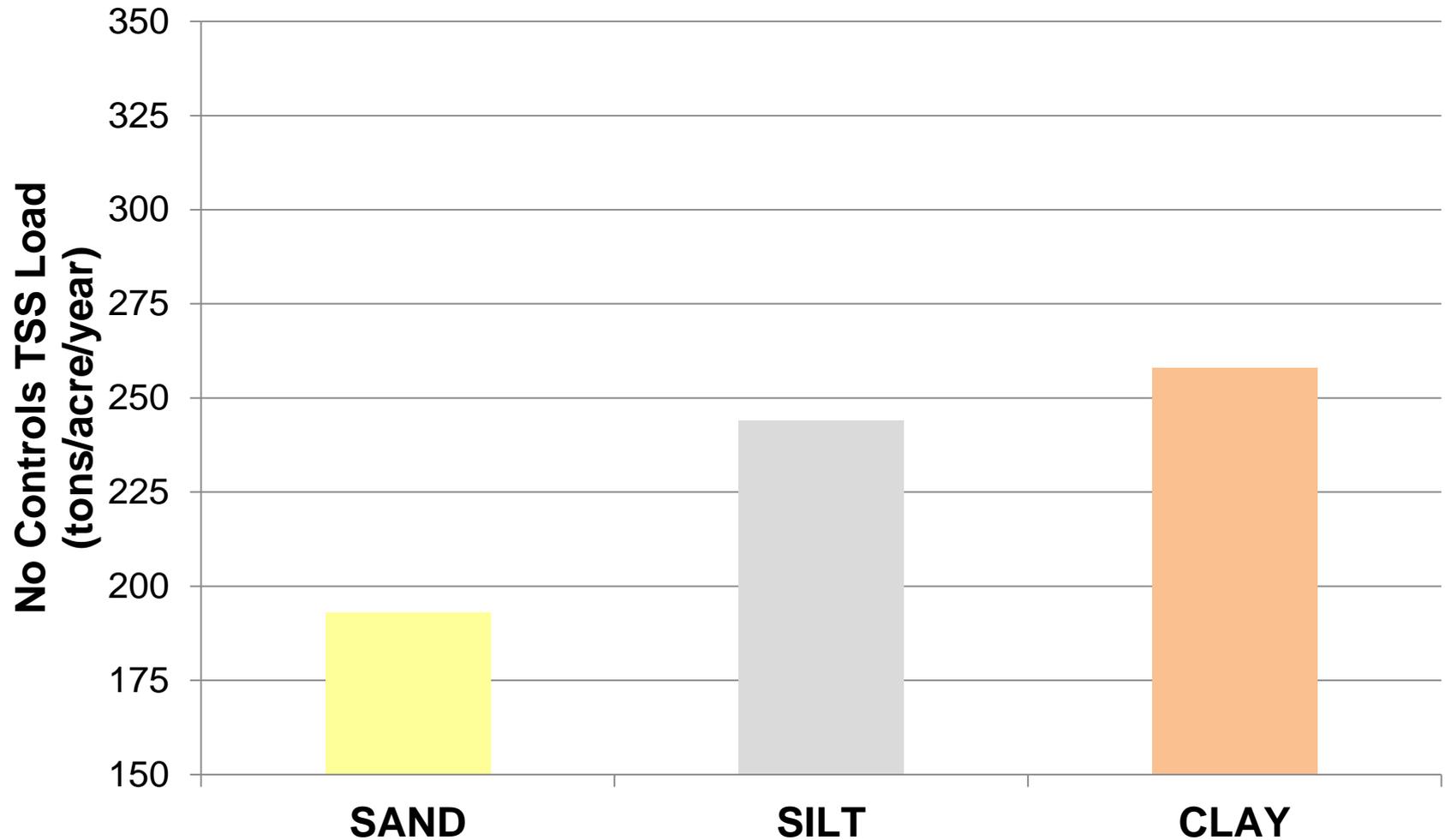
TMDL



NR 151



No Controls TSS Load Per Unit Area*

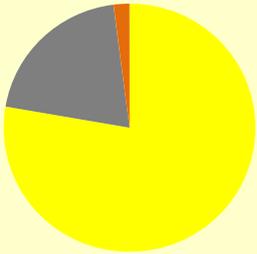


*WinSLAMM V. 10.0, Medium Density Residential No Alleys SLU, 1-year rainfall (Madison, 1981)

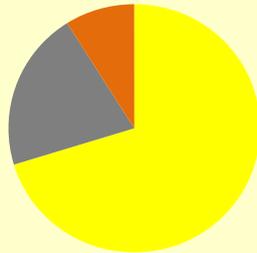
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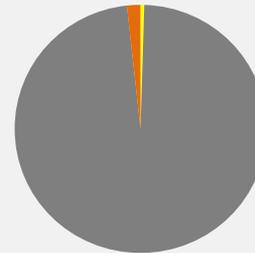
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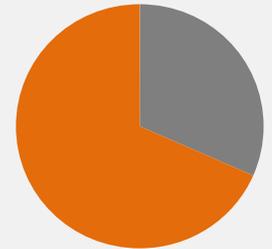
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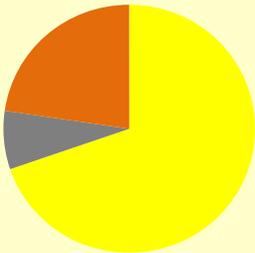
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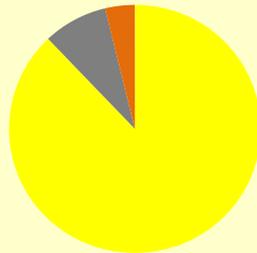
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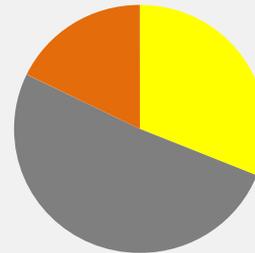
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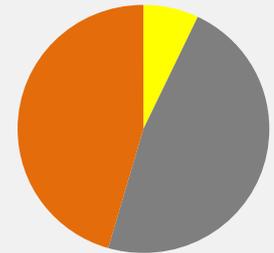
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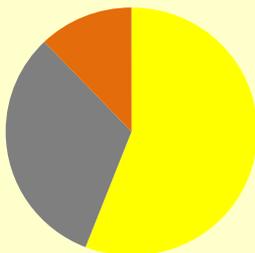
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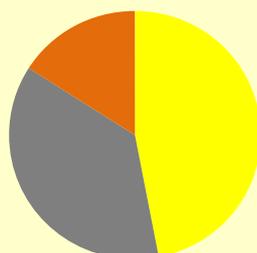
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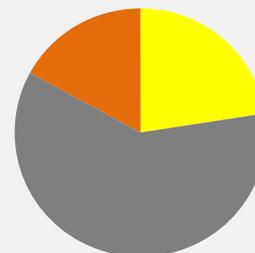
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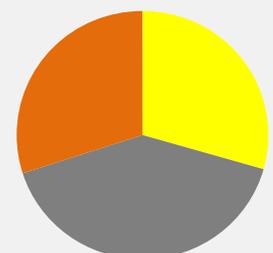
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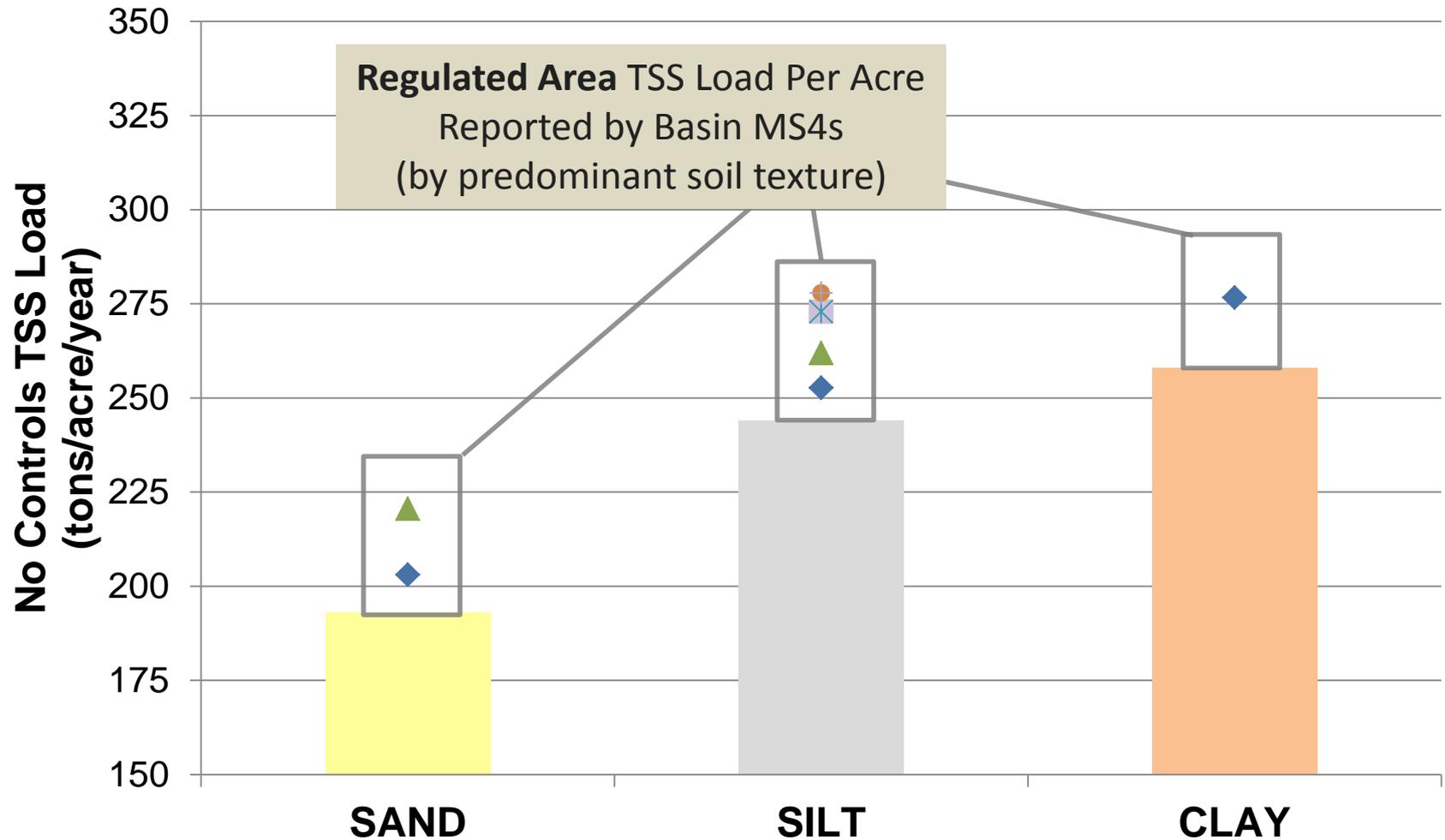
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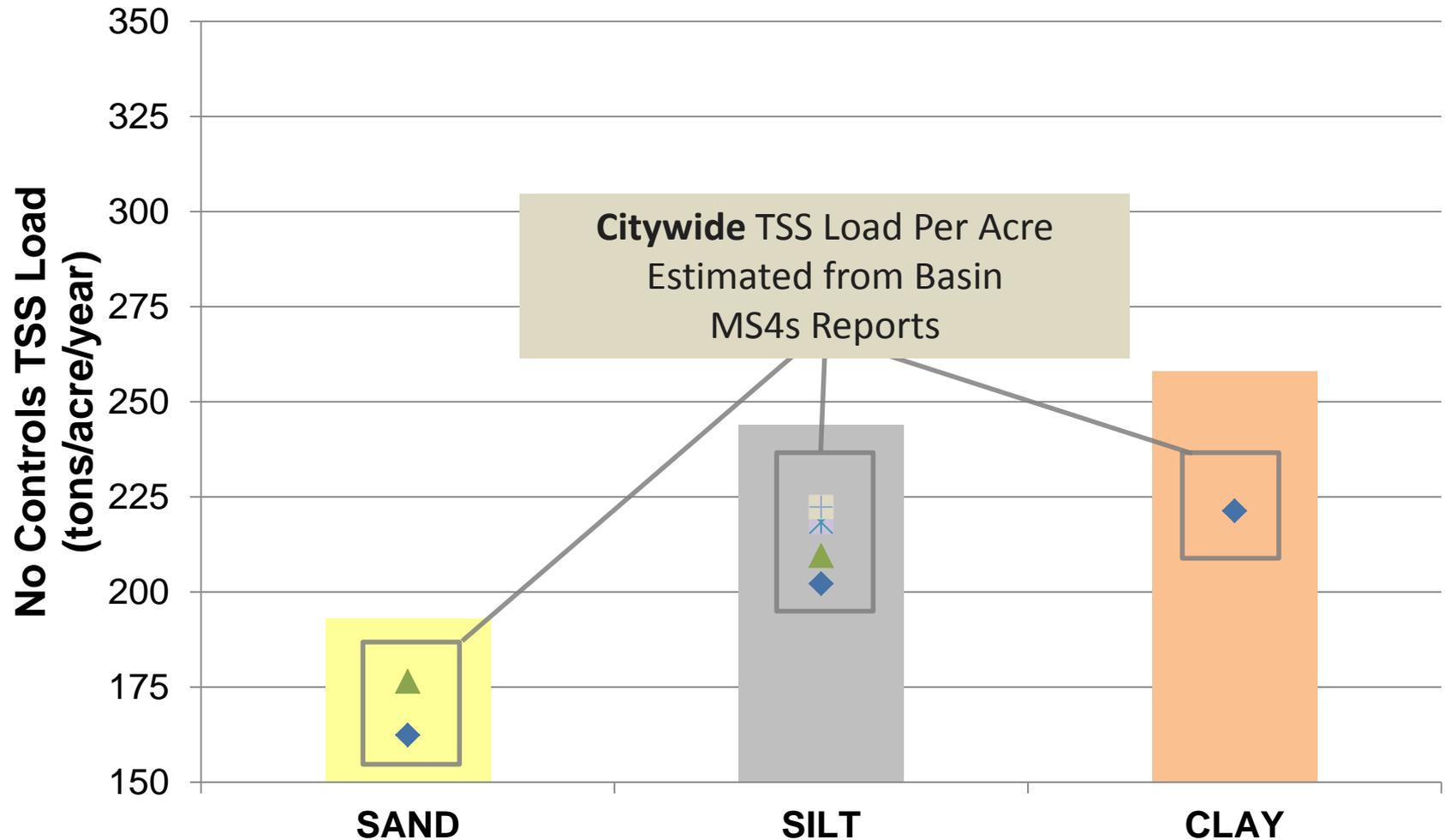


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Survey Question for Discussion

Survey Comment:

I am concerned about the level of detail, or lack thereof, for urbanized areas using the WinSLAMM model. Mostly this pertains to the blanket use of MDRNA land use. Maybe modeling the actual land uses is not going to have much impact, but if there is potential for urbanized areas to be largely the responsible parties (at least financially) it is only fair to model their contributions as accurately as possible.

Discussion Question:

- a) Is there a need for more detailed modeling?
- b) If so, are there ideas for a feasible alternative approach? Evaluate alternative approaches with the following considerations in mind:
 - Meets data input needs of SWAT model
 - Consistent treatment for all regulated MS4s
 - Compatible with TMDL development timeline
 - Municipalities willing/able to provide data/resources needed for alternative approach
 - Other considerations?

