



Thinking About Climate Change

(Extending the Service Life of Our TMDLs)

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Recent Effort Revising Old TMDLs (lots of effort)

- Consumed our TMDL lives from 2018 through 2022
- Lots of reasons for revising
 - (we weren't thinking climate)
- Learned a lot!
- Realization that revisit and revision probably should be part of our prioritization process, but...



Effects of Climate Change in Missouri

(Source: EPA 2016)

- Over past century
 - Most of the state warmed 0.5 - 1° F
 - Floods becoming more common
 - Annual precipitation increased by 5 – 10 percent
 - 35 percent increase during the 4 wettest days of the year
 - Water flowing into streams increased >20% during the worst flood of the year
- Expected over the next century
 - Increasing rainfall intensity in Spring
 - More severe summer droughts

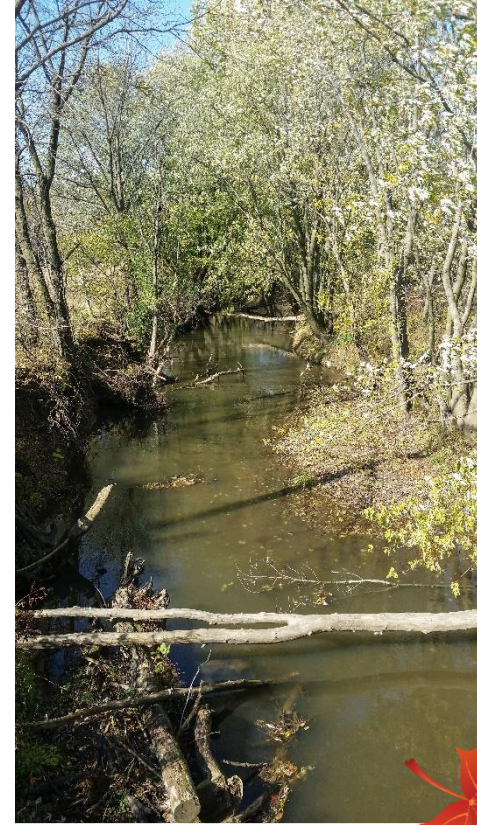
Concerns: Seasonality and Critical Conditions



Winter/Spring



Summer



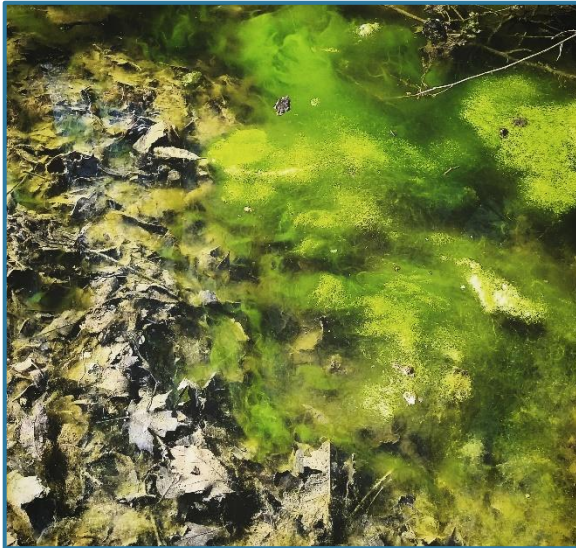
Fall



Nonpoint Source Concerns

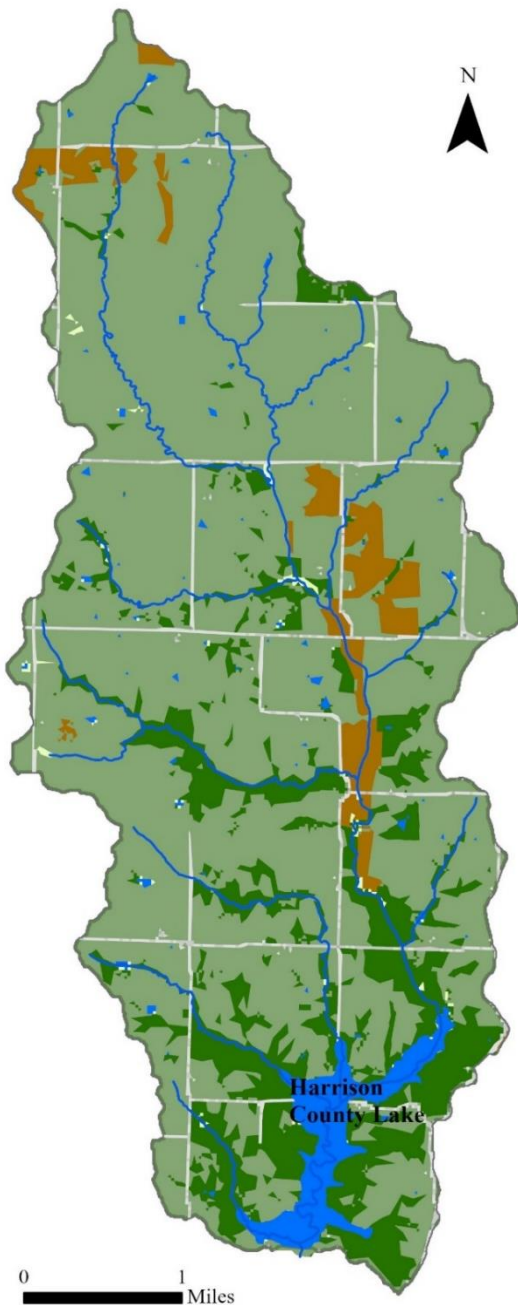
Loading or Presence Throughout the Year; Any Time, Any Season

- Nutrients
- Suspended Sediment
- Benthic or suspended algae
- Cyanobacteria



First TMDL Targeting Lake Nutrient Criteria

- More specific LAs by land cover
- Runoff variable LAs
- Present expected future load?



Name
20-year Runoff Crop.xlsx
20-year Runoff Forest.xlsx
20-year Runoff Pasture.xlsx
20-year Runoff Urban.xlsx
Bethany 20-year Precipitation.csv

Thoughts for Considering Climate Change

How Can We Address Expected Future Changes?

- Limit period of flow data to 20 years
- Use 15-year Climate Normal data instead of 30-year?
- Focus more on rainfall intensity not just amount?
- Project future loading capacity based on these?