

Sioux Falls Bacteria and Sediment Total Maximum Daily Load Project Public Meeting



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What is a TMDL?

✓ Total Maximum Daily Load (TMDL)

TMDL: “Greatest amount of a pollutant that a waterbody can accept and still meet water-quality standards.”

✓ Water-Quality Standards

- è *Required by Clean Water Act*
- è *Based on beneficial uses*
- è *Numeric or narrative criteria*

✓ All Impaired Waterbodies Must Be Evaluated Using a TMDL Study

How is a TMDL Calculated?

TMDL =

**Waste Load
Allocation**

**Point Sources
Permitted**



+

**Load
Allocation**

**Nonpoint Sources
Overland Flow**



+

**Margin of
Safety**

Safety Factor

**SAFETY
FIRST**

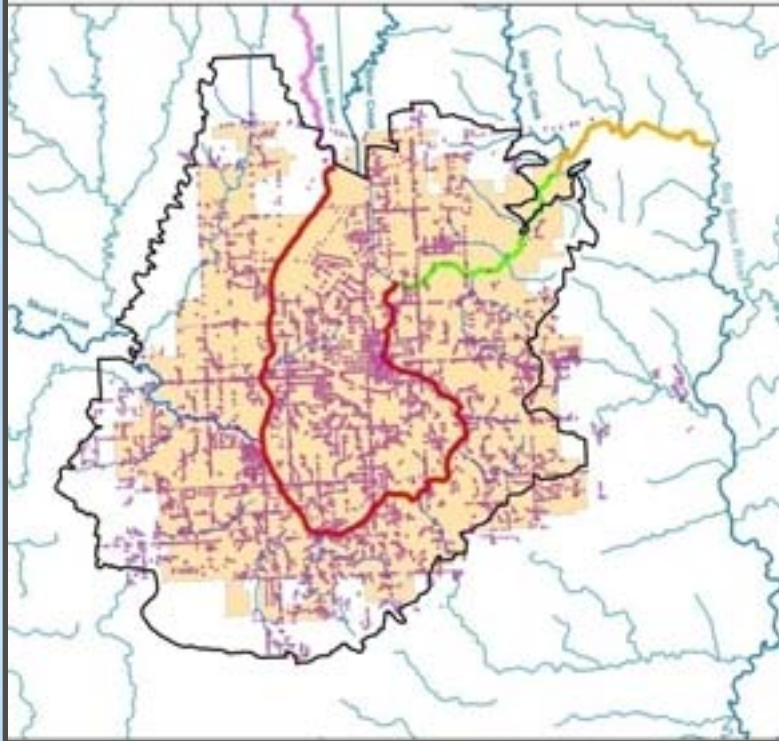
**THE SAFE WAY IS
THE BEST WAY**

Why Is Total Suspended Solids (TSS) an Issue?

Total Suspended Solids Facts

- ✗ Inhibits habitat for aquatic life
- ✗ Aesthetically unappealing
- ✗ Standard written to protect warm-water fishery (158 mg/L)

Sioux Falls Storm Basin Area

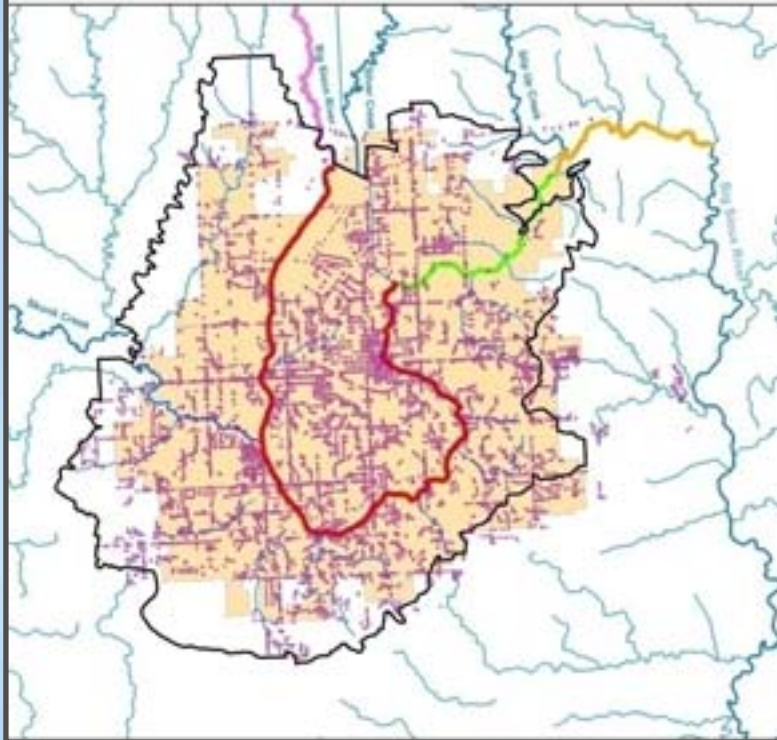


Why Is Bacteria an Issue?

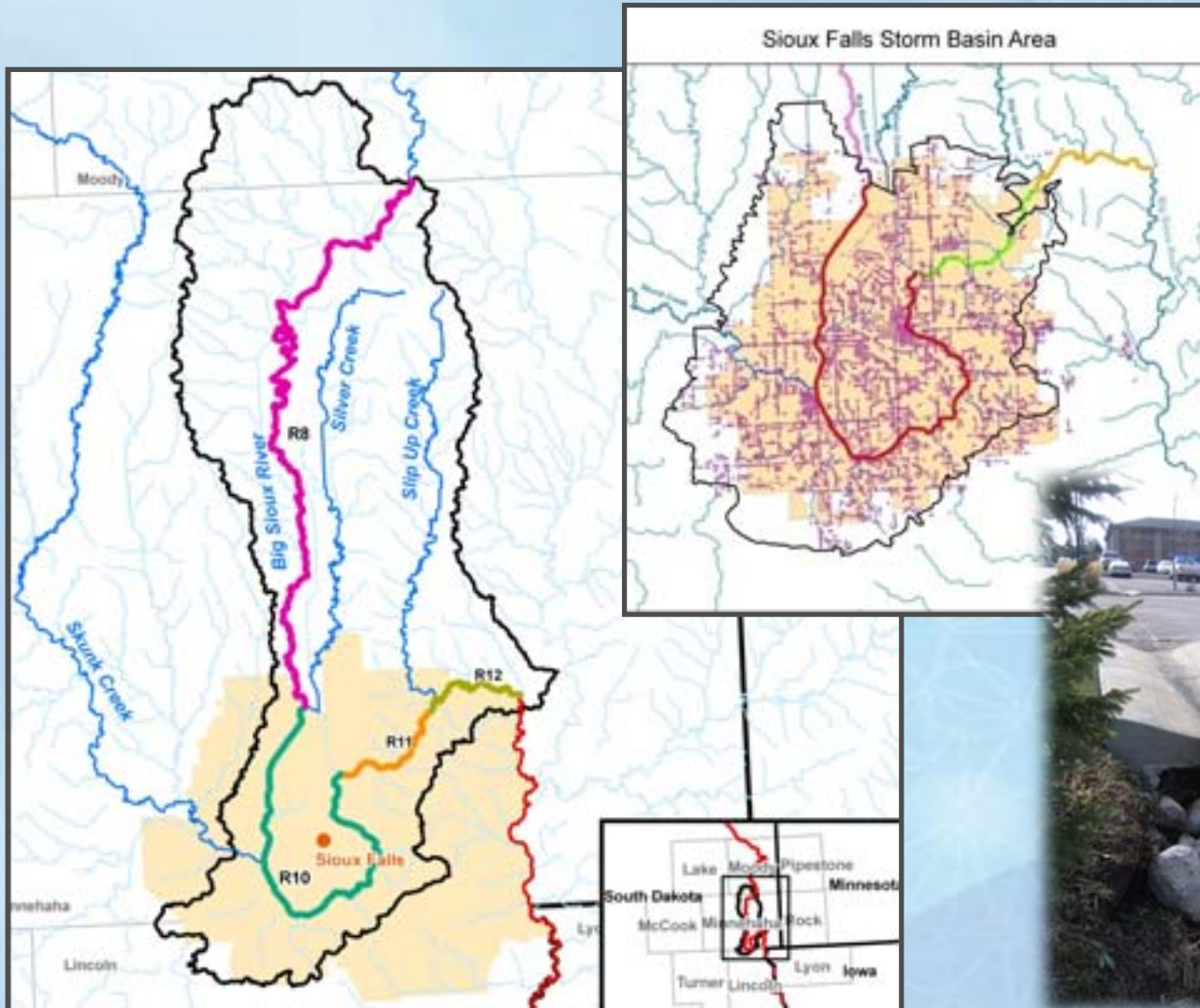
Fecal Coliform/E-Coli Facts:

- ✗ Intestines of warm-blooded animals
- ✗ Used as indicator for other pathogens
- ✗ Standard written to protect immersion recreators (235 cfu/100 mL)

Sioux Falls Storm Basin Area

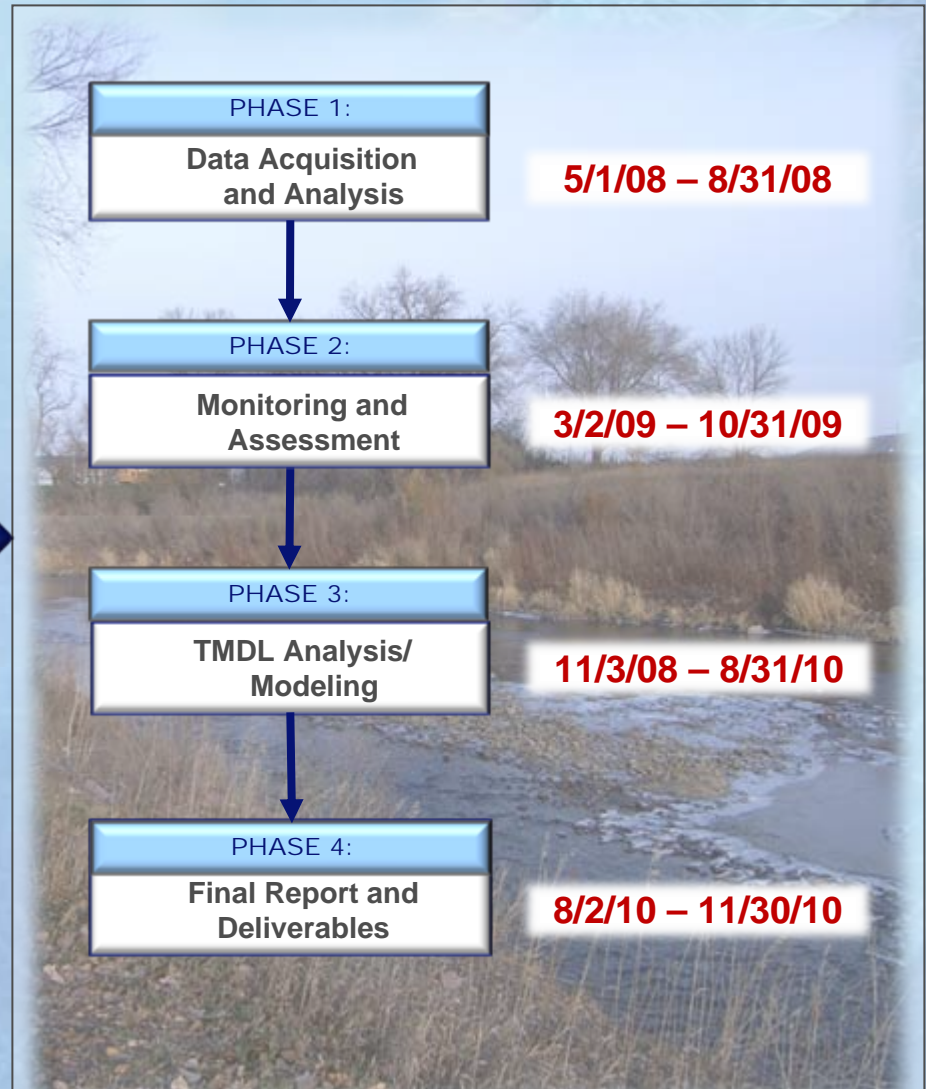


Project Area



Project Phases

Current Phase →



Phase 2: Monitoring

- ✓ **March–October 2009**
- ✓ **Weekly Grab Samples**
- ✓ **Discharge Measurements**
 - è *Develop stage discharge relationships*
- ✓ **Storm Events**
- ✓ **NPDES Sampling**
- ✓ **Microbial Source Tracking**



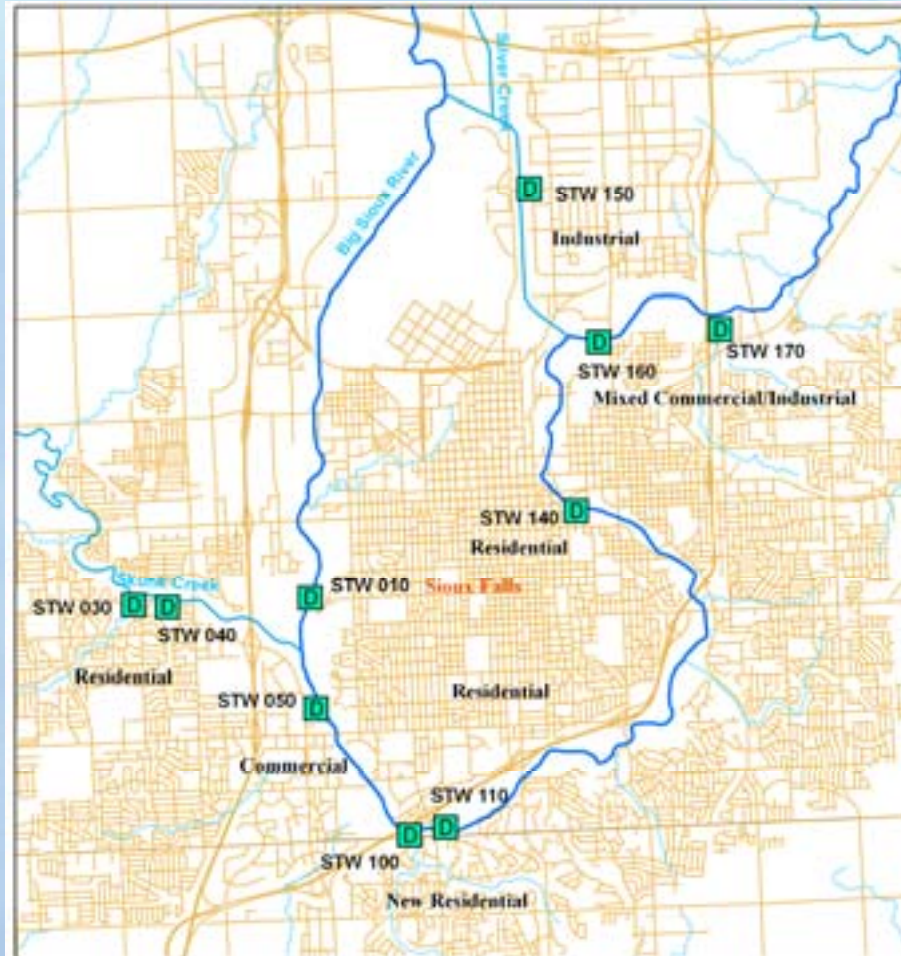
Phase 2: Monitoring

v Stream Sampling Locations

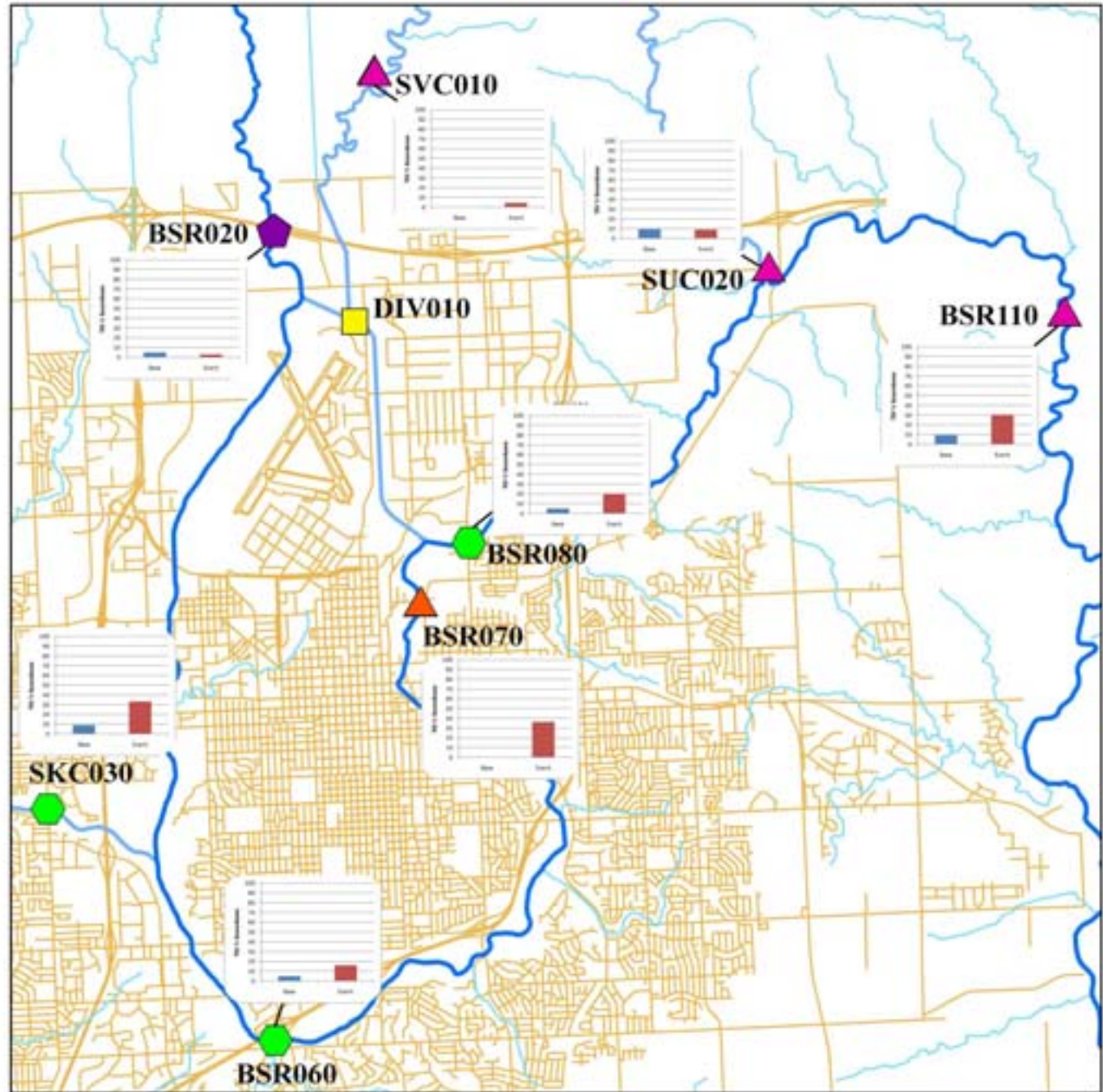


Phase 2: Monitoring

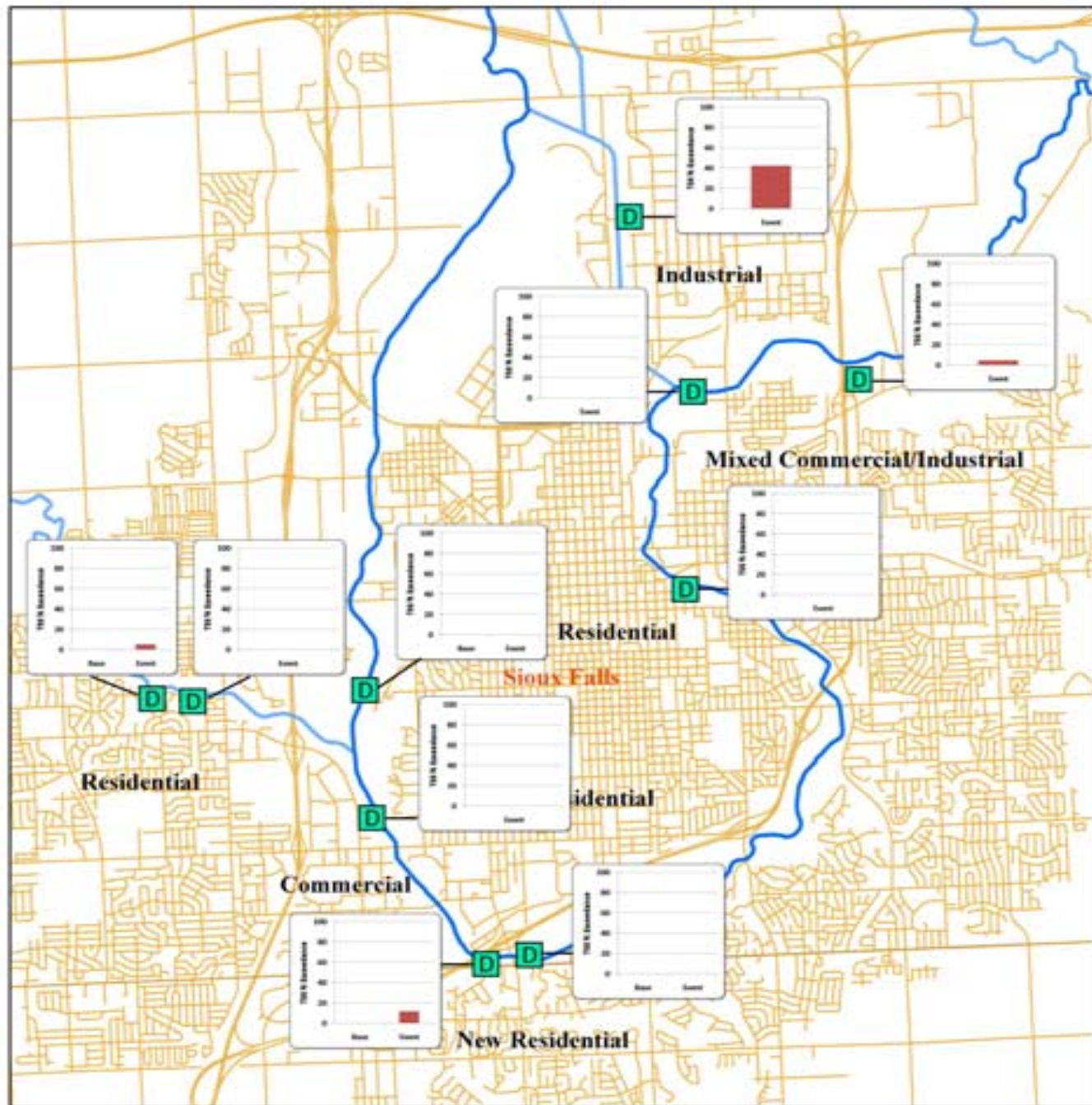
v Urban Storm Water Sampling Sites



Main Stem TSS Exceedences



Storm Water TSS Exceedences



STW 150 - Benson Road

Sioux Falls Urban Storm Drains

Benson Road



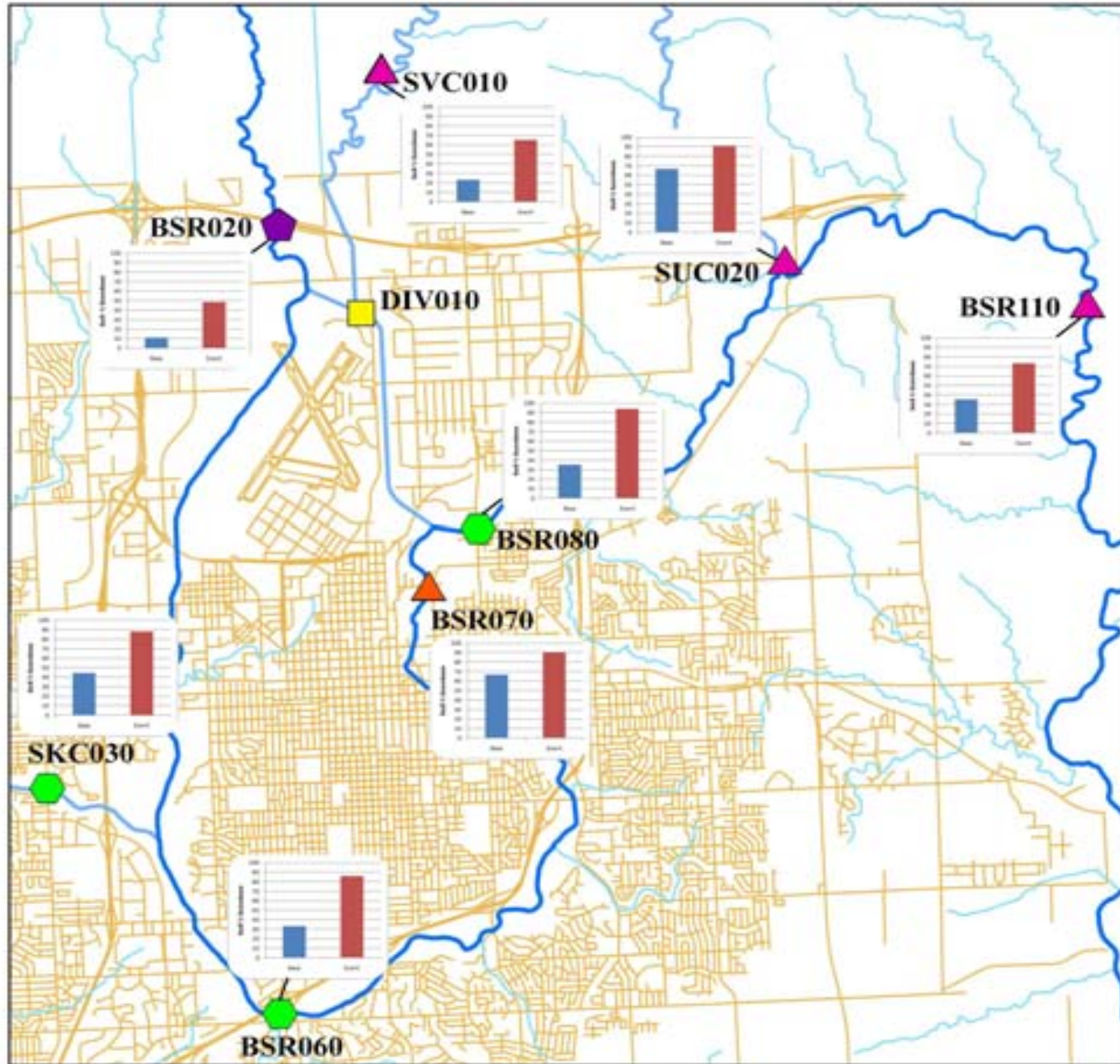
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1447 ft

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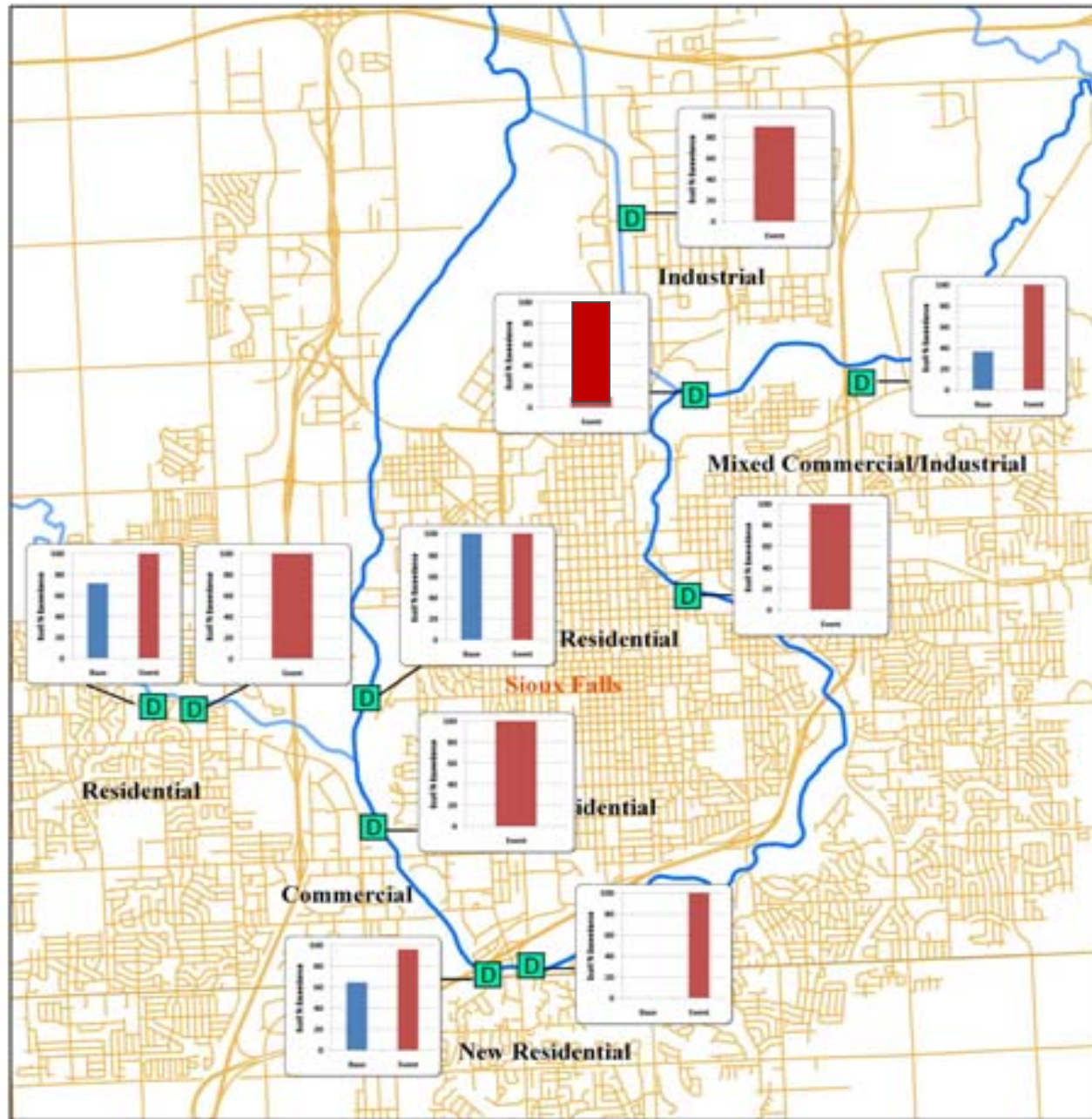


Main Stem Ecoli Exceedences



**Water Quality Standard only applies to the Big Sioux River*

Storm Water Ecoli Exceedences



**Water Quality Standard only applies to the Big Sioux River*

Urban Watershed Locations

v Drainages for older residential sites



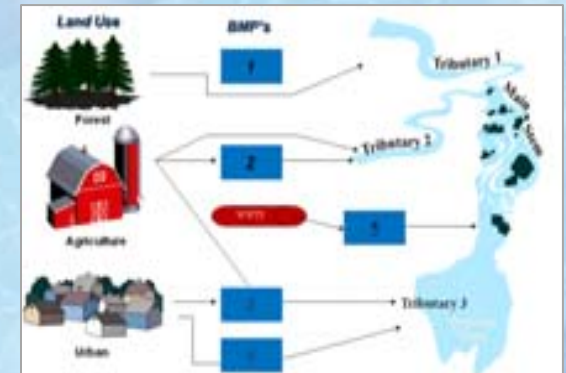
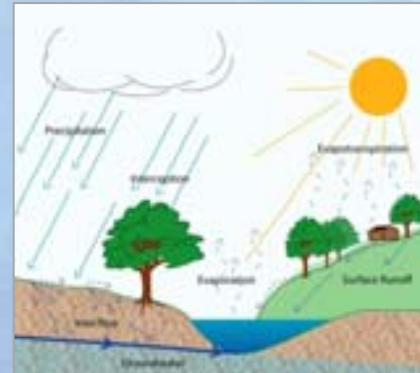
Monitoring Preliminary Conclusions

- ✓ **Sioux Falls stormwater BMPs effective at controlling sediment**
- ✓ **Skunk Creek may be significant contributor to bacteria loading**
- ✓ **Significant bacteria are may be originating from Sioux Falls stormwater outfalls**

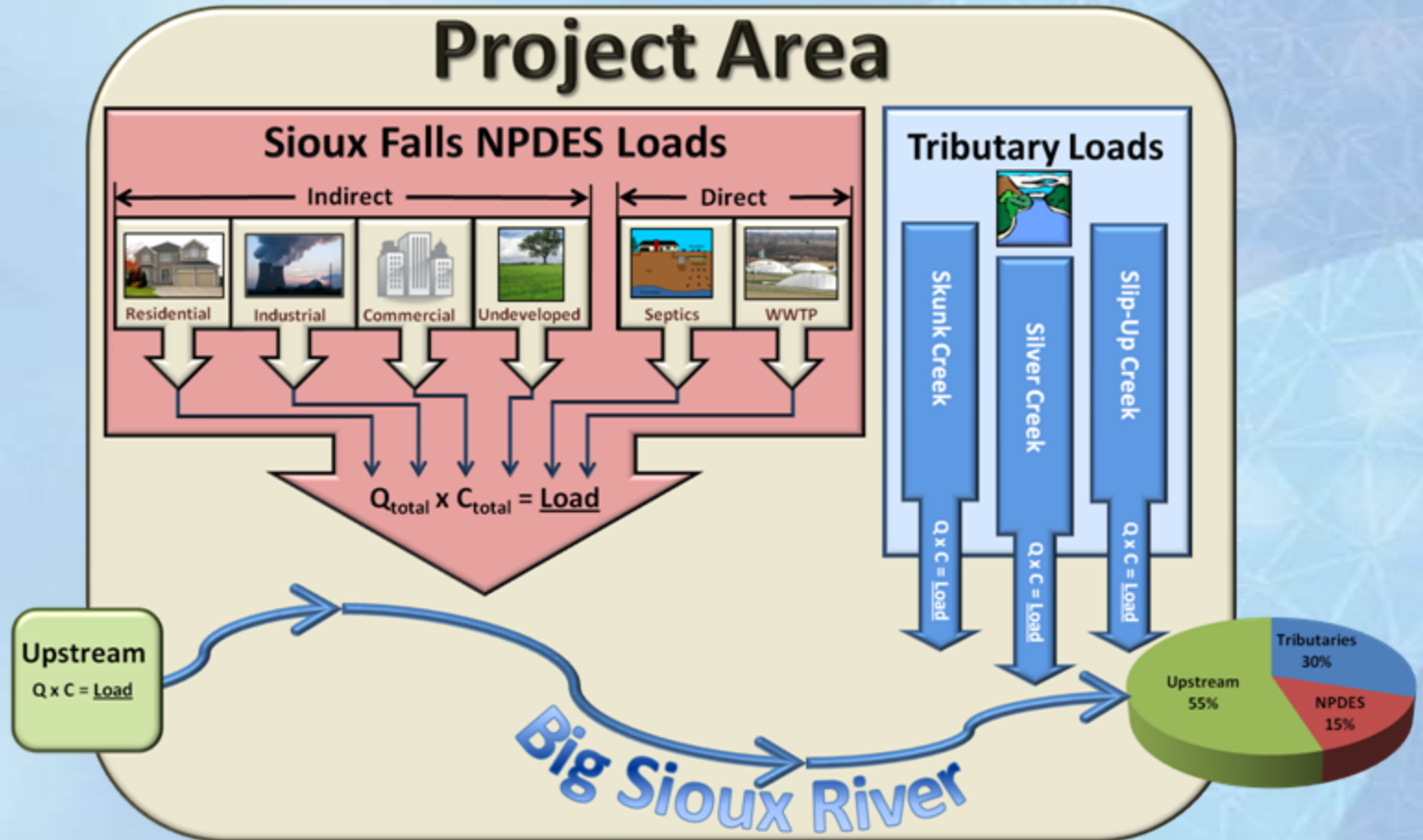
Phase 3: Modeling

V Focus of Mathematical Modeling

- è *Understand rate and transport*
- è *Allocate loads to sources*
- è *Evaluate effectiveness of BMPs*



Phase 3: Modeling



Phase 3: Modeling

V How Do We Reduce Loadings?

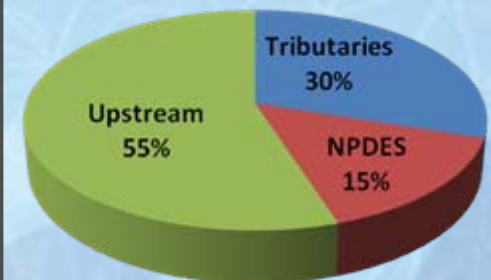
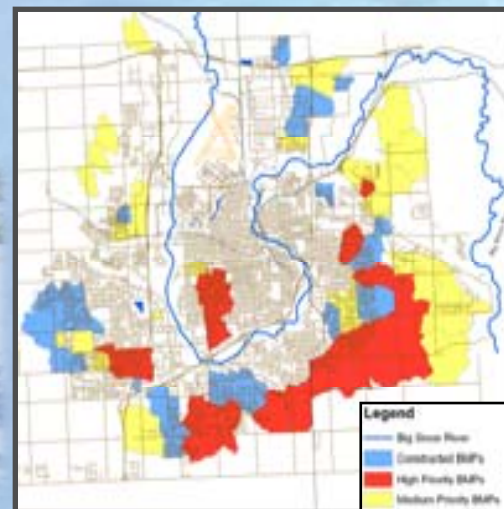
è *Model existing and suggested BMPs*

F Allocate loads to sources

F Evaluate/predict effectiveness of BMPs

è *BMP Prioritization*

F Based on primary stressors, BMP effectiveness and cost-benefit analysis



Questions?