

# Implementing a Sampling Plan for Bacteria Impairments in Sioux Falls, South Dakota



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**RESPEC**

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Brookings, South Dakota

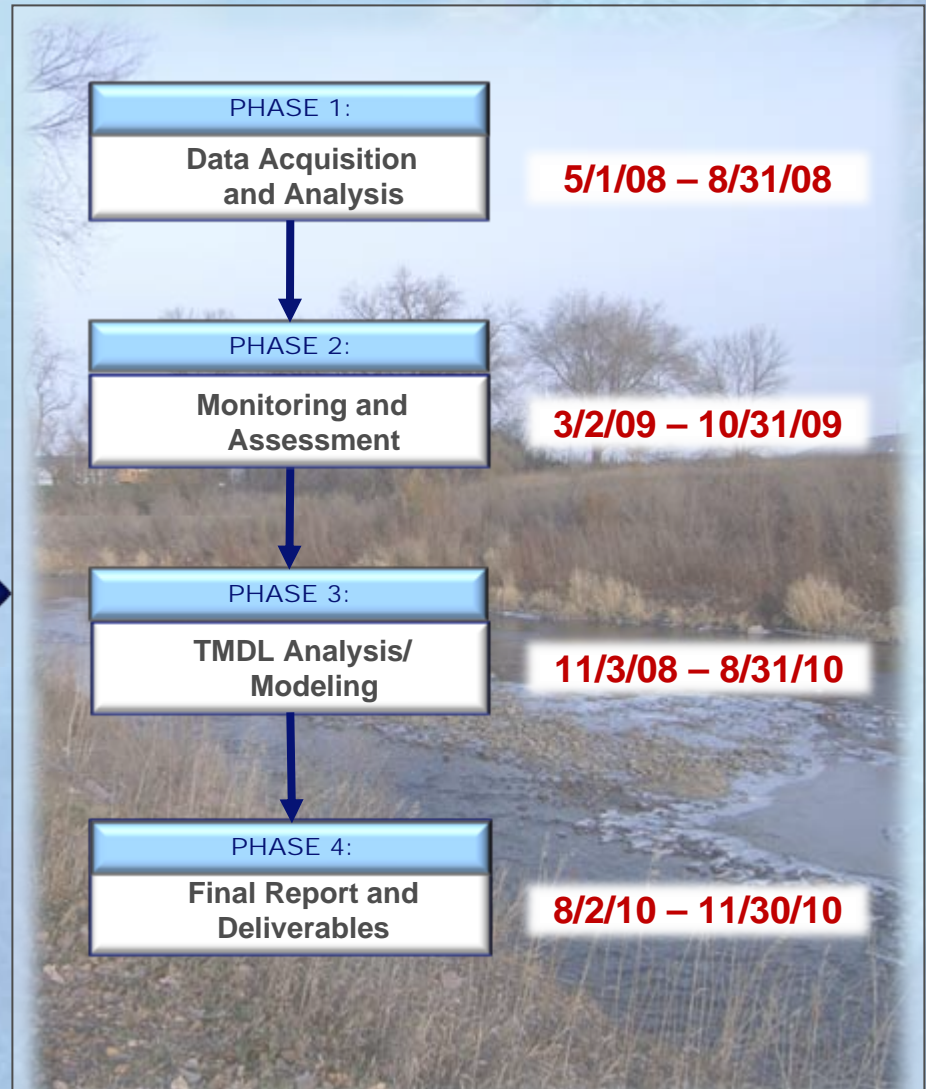
# Presentation Outline

- ✓ **Sampling Locations**
- ✓ ***E. coli* Concentrations**
- ✓ ***E. coli* Loads**
- ✓ **Total Suspended Solids (TSS) Concentrations**
- ✓ **Quality Assurance/Quality Control (QA/QC) Analysis**
- ✓ **Conclusions**



# Project Phases

**Current Phase**



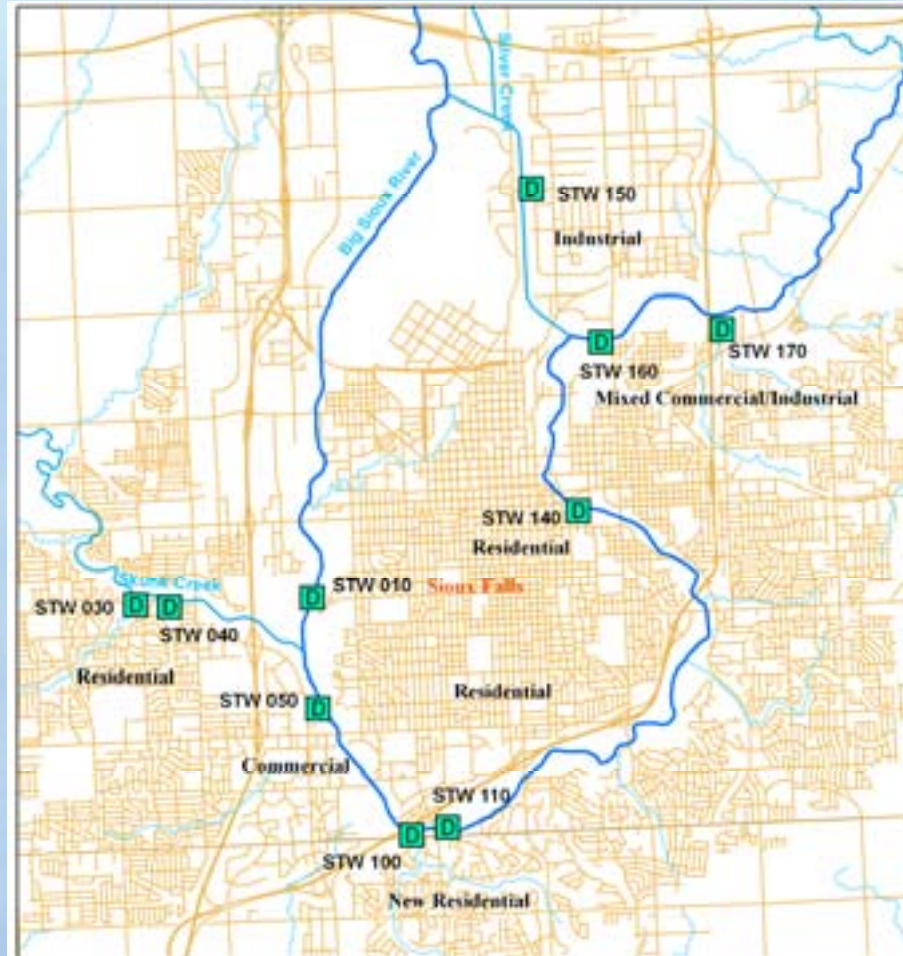
# Phase 2: Current Monitoring

## v Stream Sampling Locations



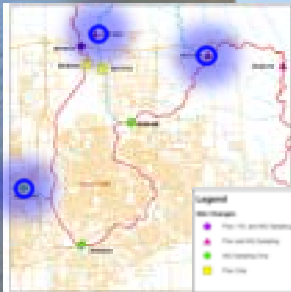
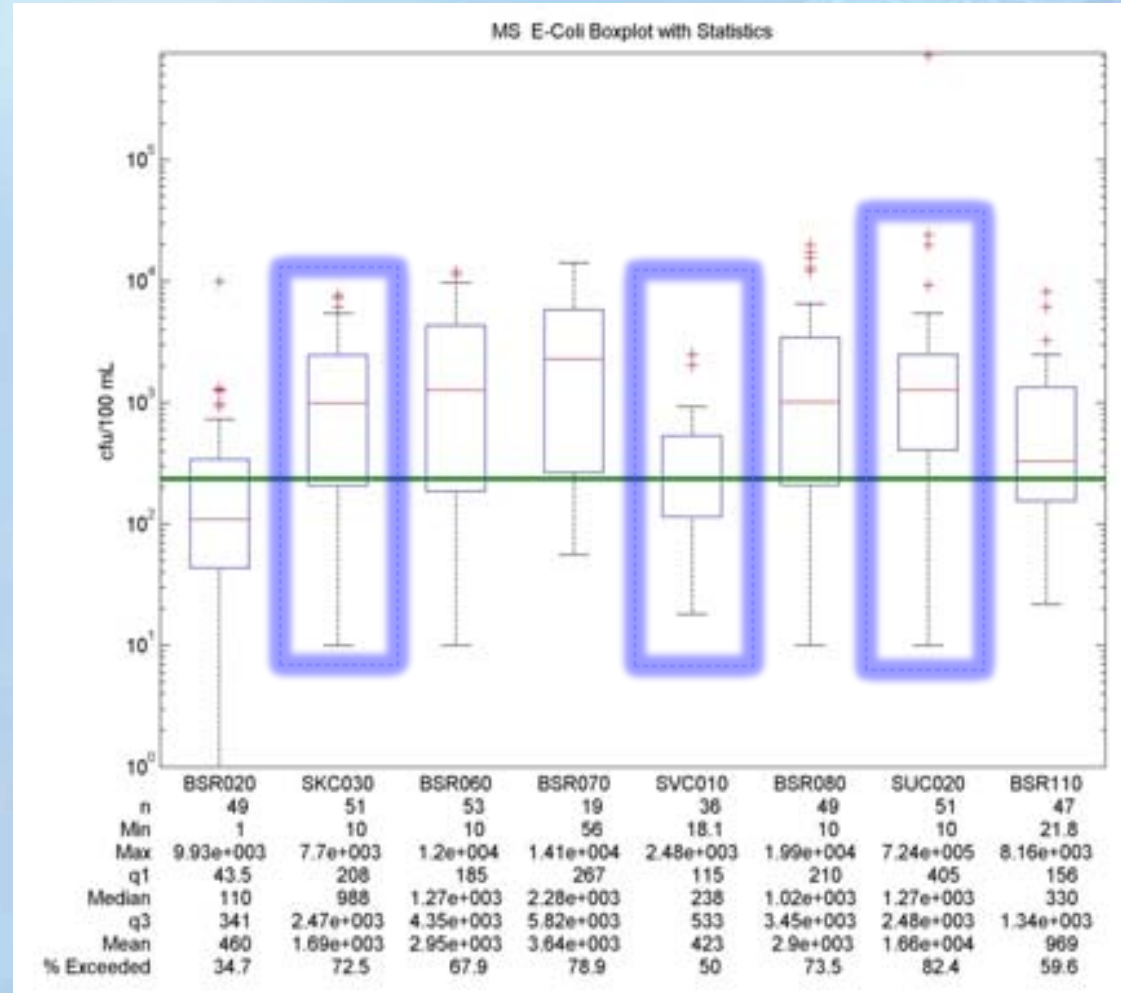
# Phase 2: Current Monitoring

## v Urban Storm Water Sampling Sites



# E. coli Concentrations

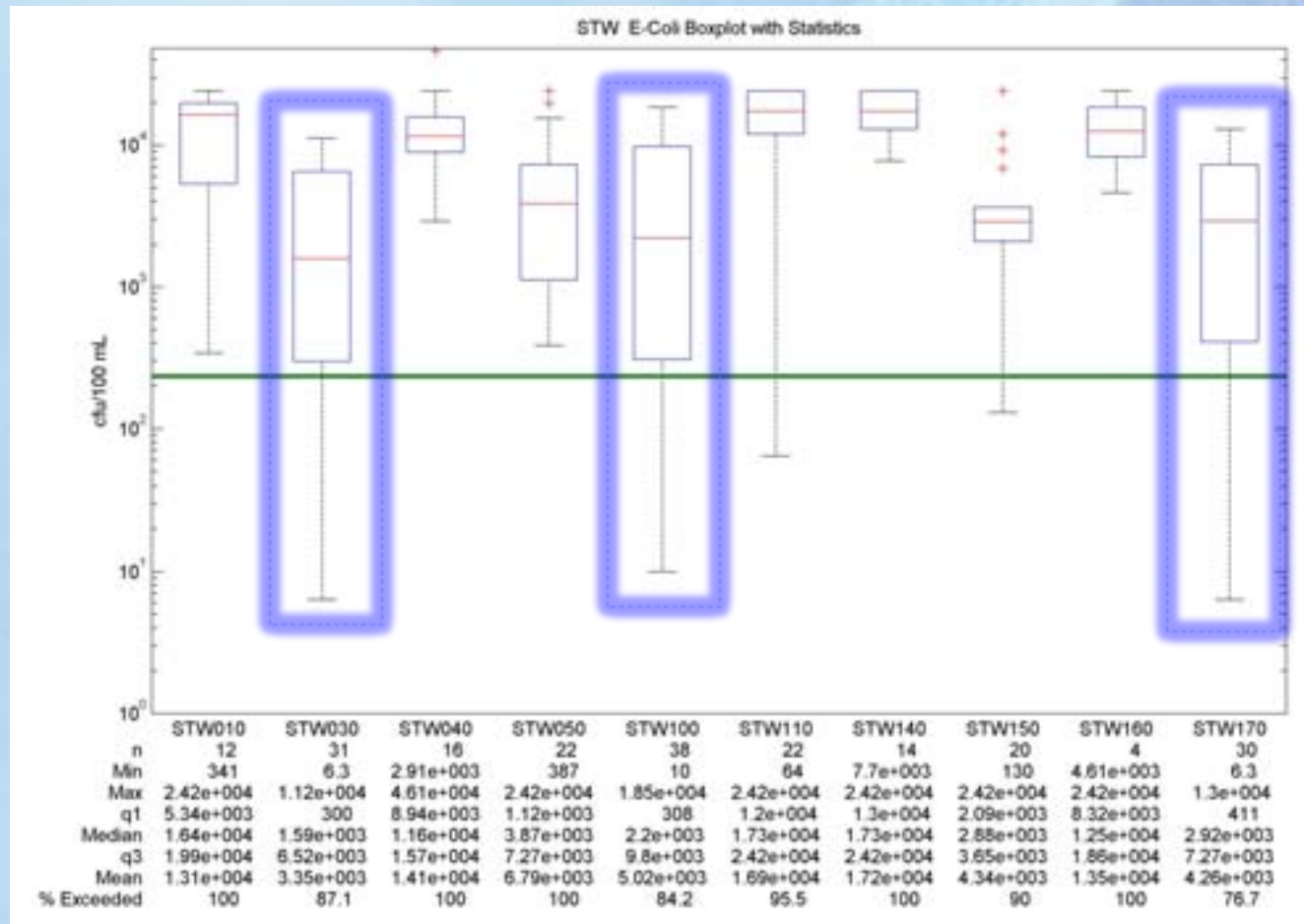
## ▼ Mainstem and Large Tributaries



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

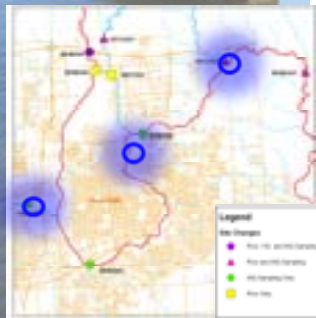
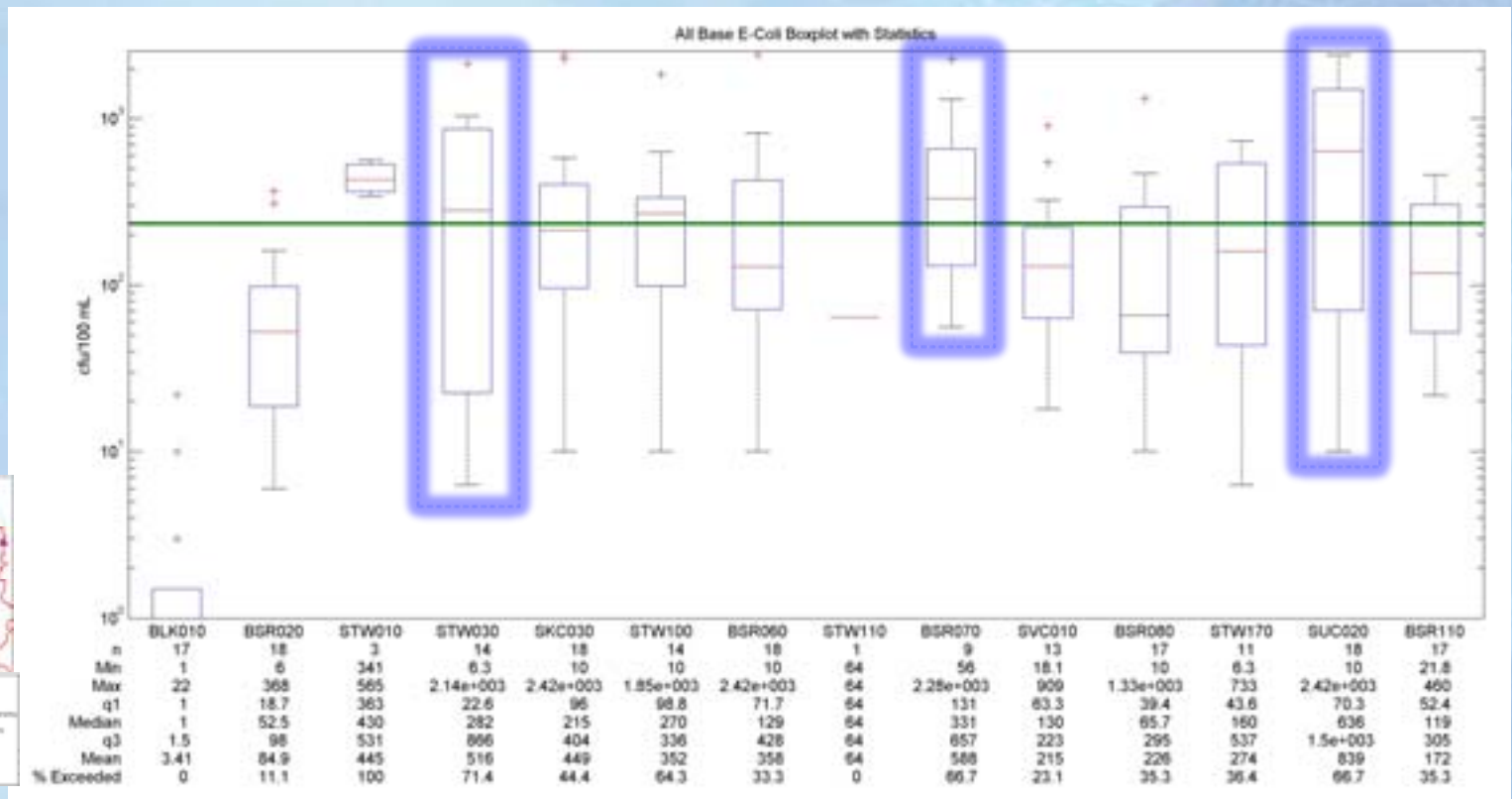
# E. coli Concentrations

## ▼ Stormwater Outfall Sites



# E. coli Concentrations

## v Baseflow Concentrations – All Sites

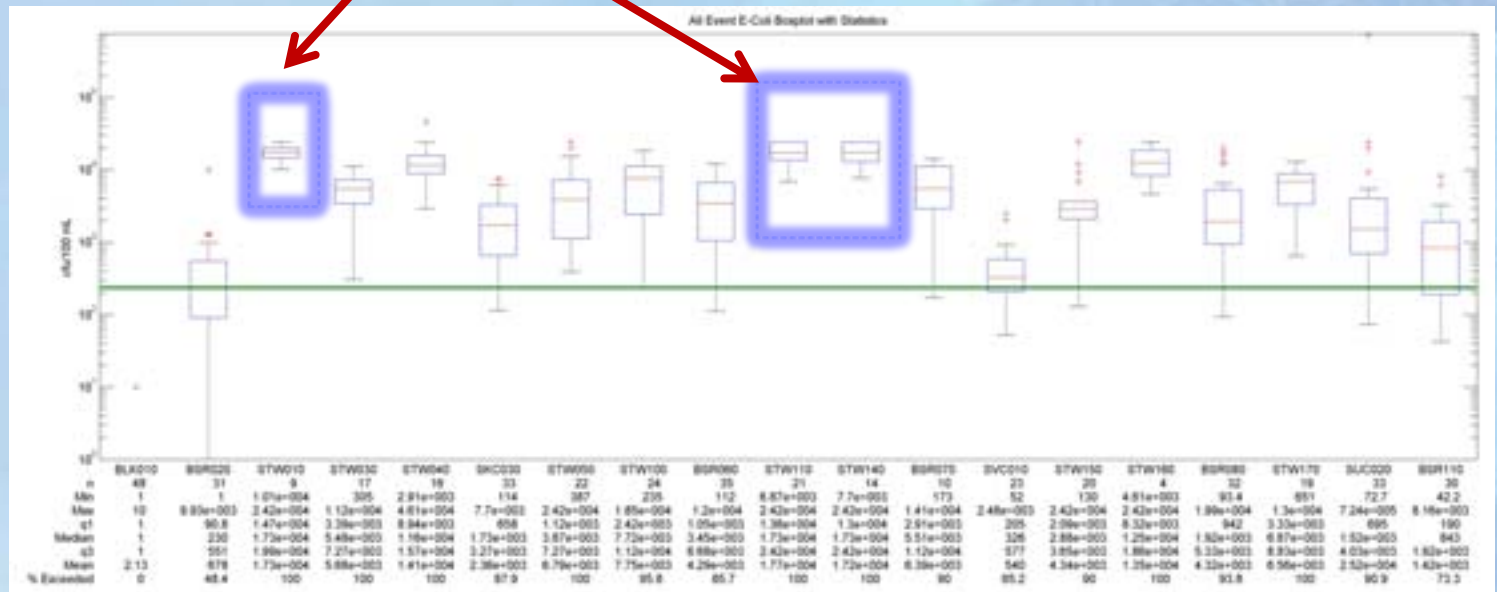


**\*Water Quality Standard only applies to the Big Sioux River**

# E. coli Concentrations

## v Storm Event Concentrations – All Sites

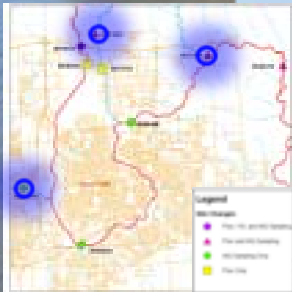
Old Residential Areas



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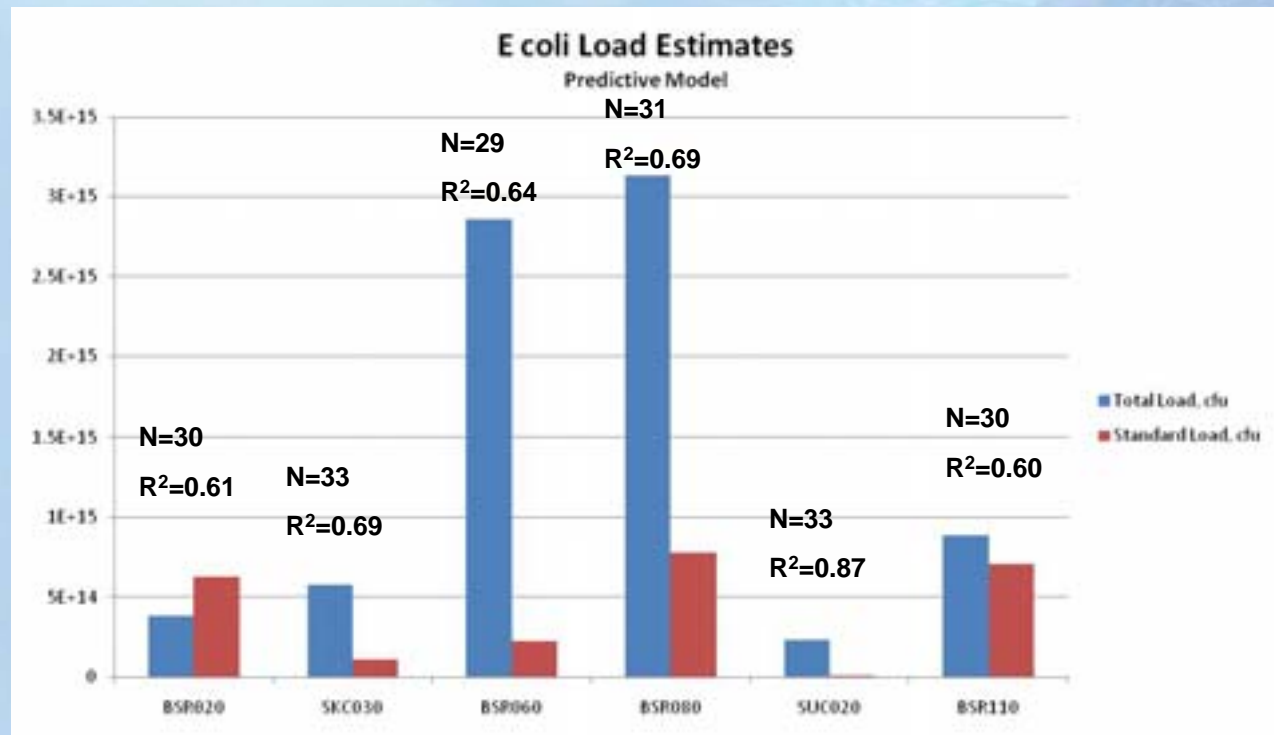
# Urban Watershed Locations

## v Drainages for older residential sites



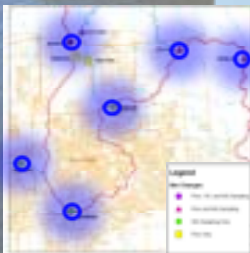
# E. coli Loads

## 2009 Seasonal Load Estimate



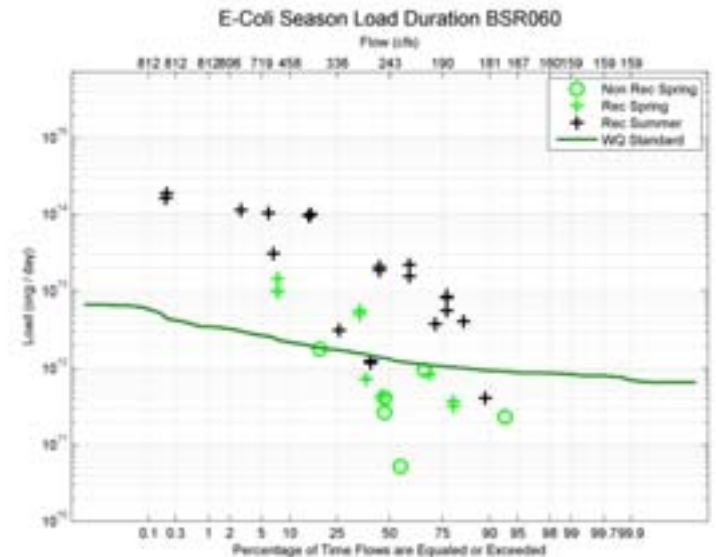
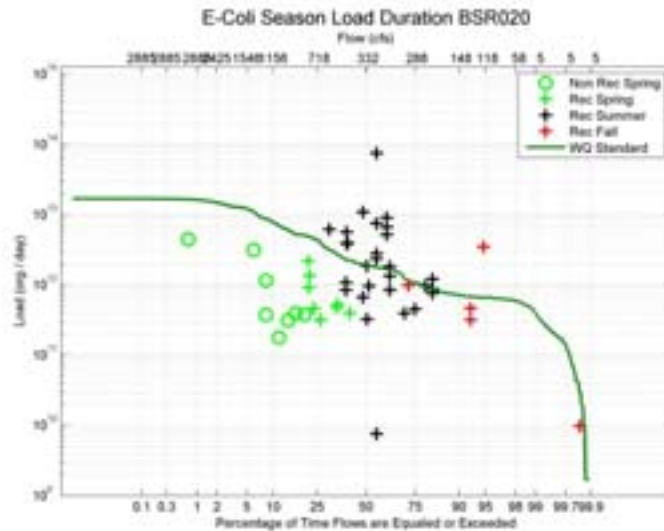
Upstream

Downstream



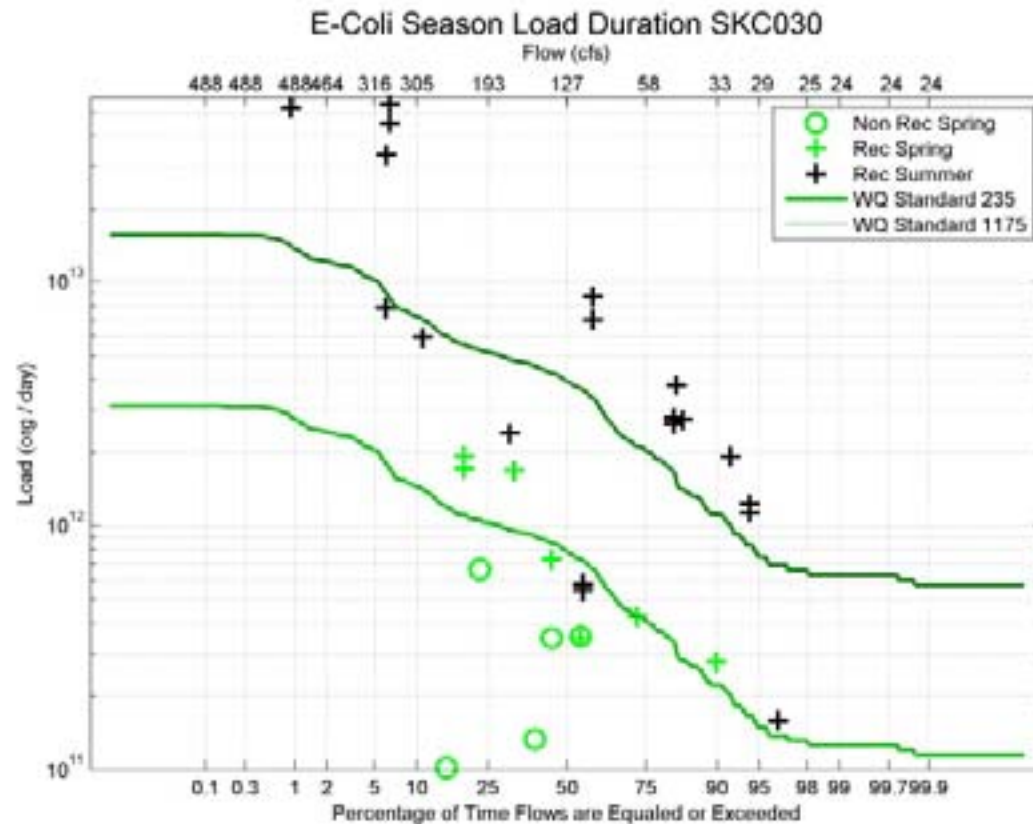
# Bacteria Results: Mainstem

## ▼ Load Duration Curves



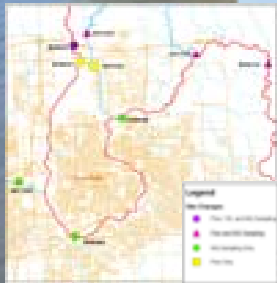
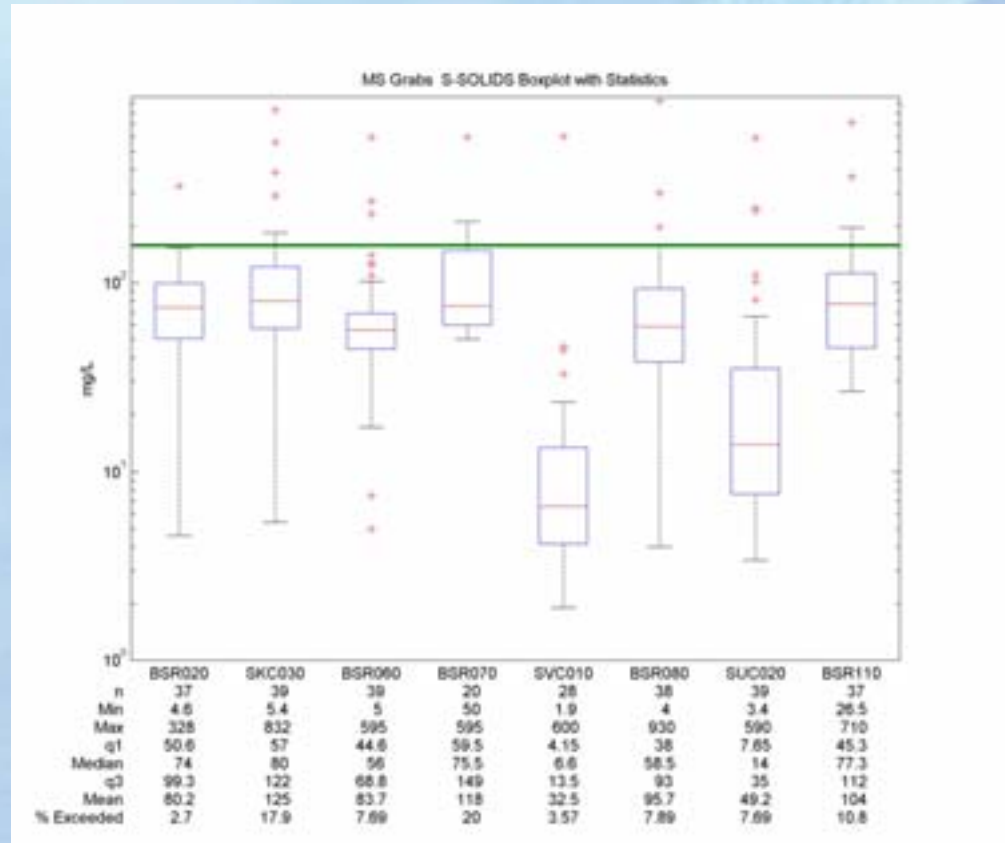
# Bacteria Results: Mainstem

## ∨ Load Duration Curves



# TSS Concentrations

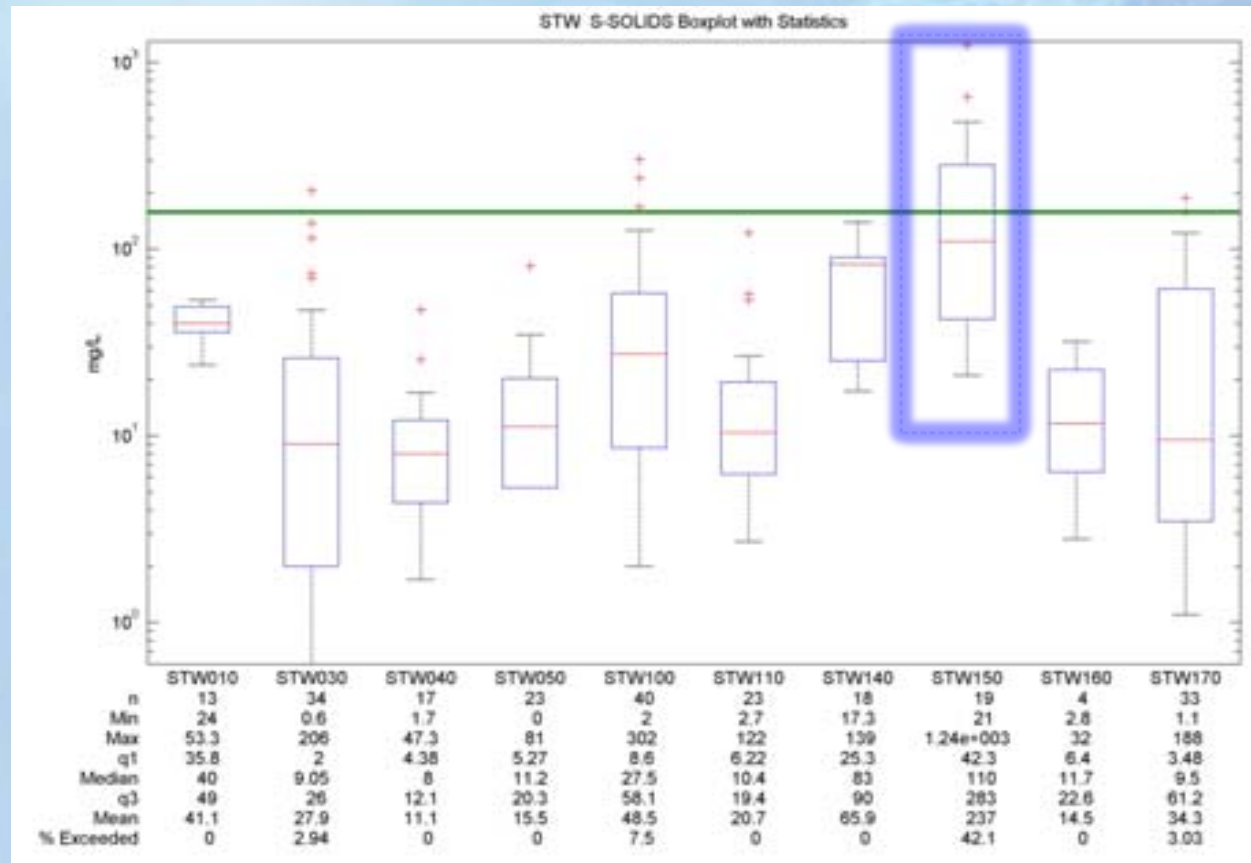
## ▼ Mainstem Sites (grab samples only)



Upstream → Downstream

# TSS Concentrations

## ▼ Stormwater Outfall Sites



Upstream

Downstream

*\*Water Quality Standard only applies to the Big Sioux River and main tributaries*

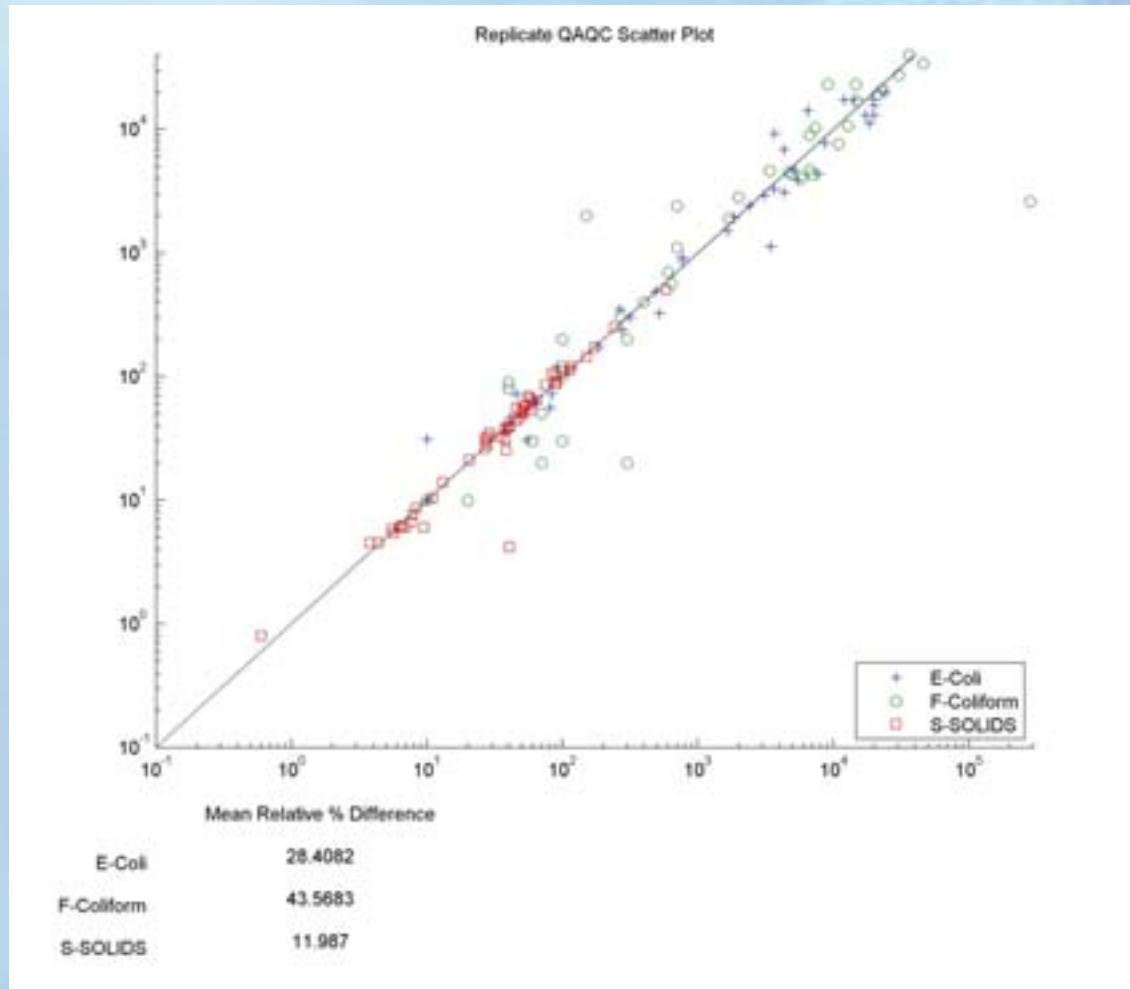


# STW 150 - Benson Road



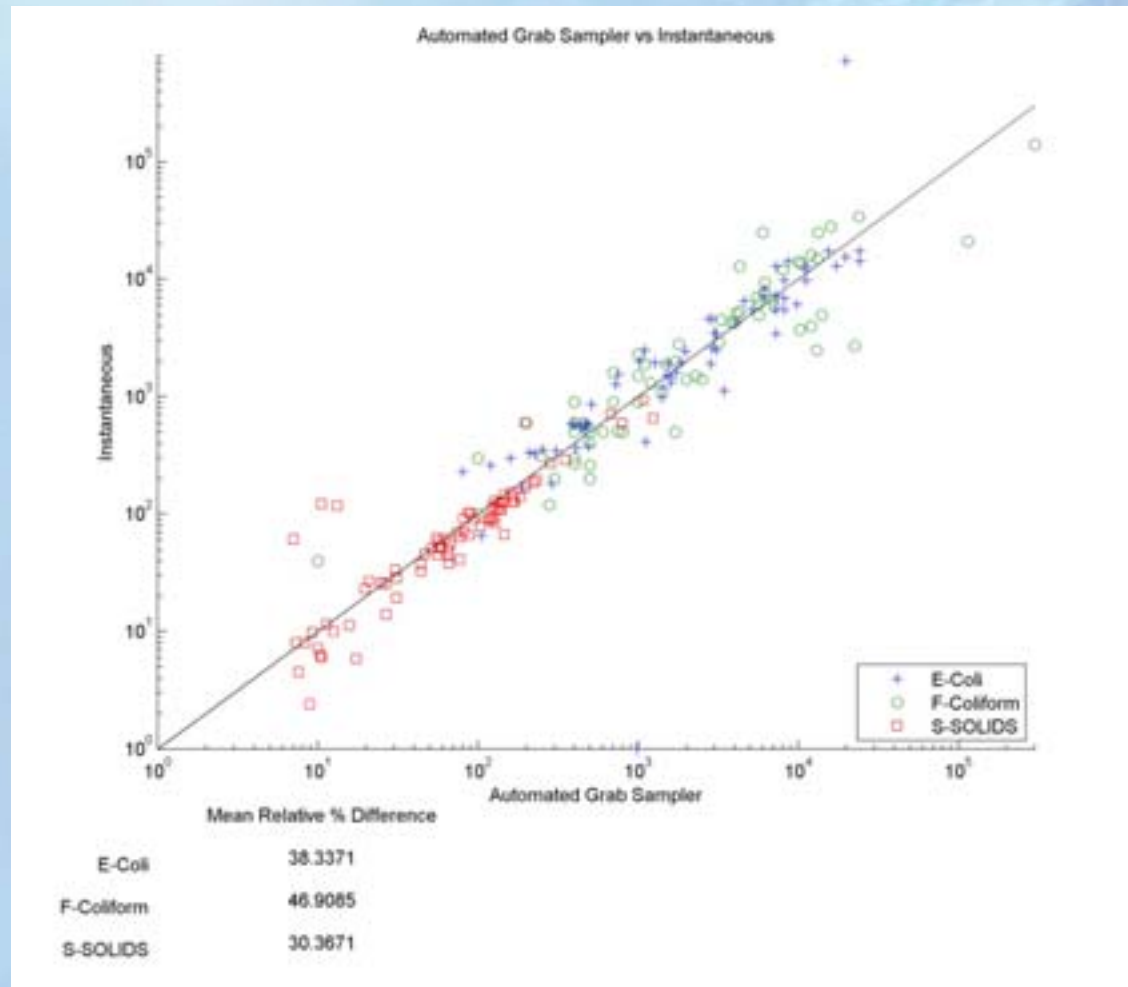
# Field Sampling QA/QC

## Field Replicate Comparison



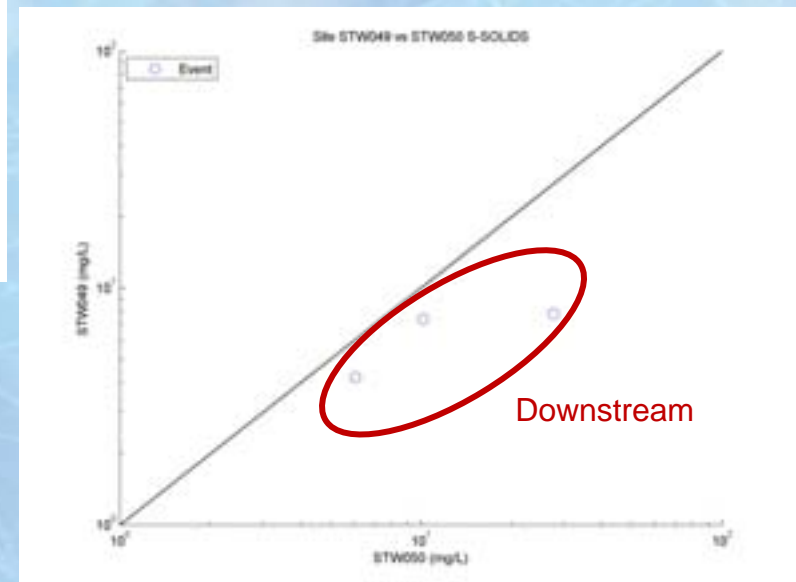
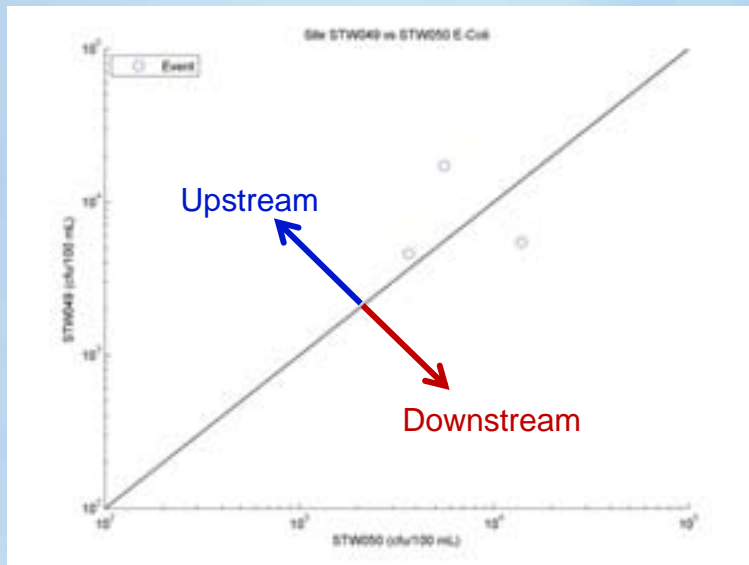
# ISCO QA/QC

## v ISCO Scatter Plot



# BMP Effectiveness

## ✓ Upstream/Downstream of a Small Wetland



# Conclusions: Bacteria

- ✓ **Skunk Creek appears to influence water quality on the Big Sioux River**
- ✓ **Stormwater Outfalls are a Large Contributor to the Bacteria Loading**
  - è *Older residential areas have high concentrations and loads*



# Conclusions: TSS

- ✓ **Big Sioux River is not listed as impaired**
- ✓ **Sioux Falls stormwater management plan is probably effective for TSS**



# Questions?

