

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



Cory Foreman, Jared Oswald, and Jason Love

RESPEC

November 3rd, 2009
Brookings, South Dakota

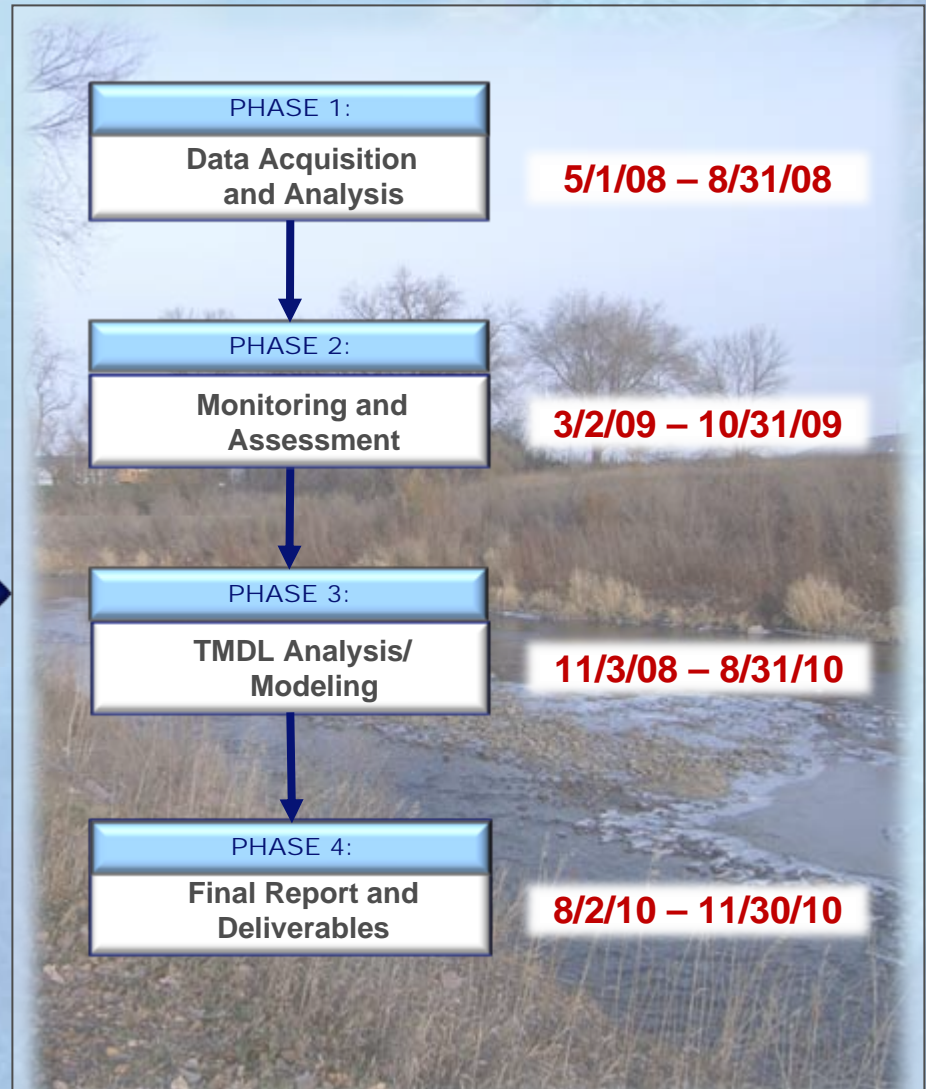
Presentation Outline

- ✓ **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



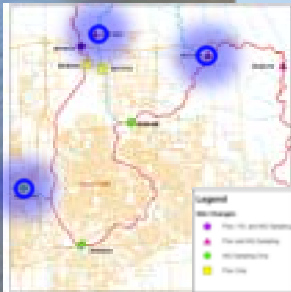
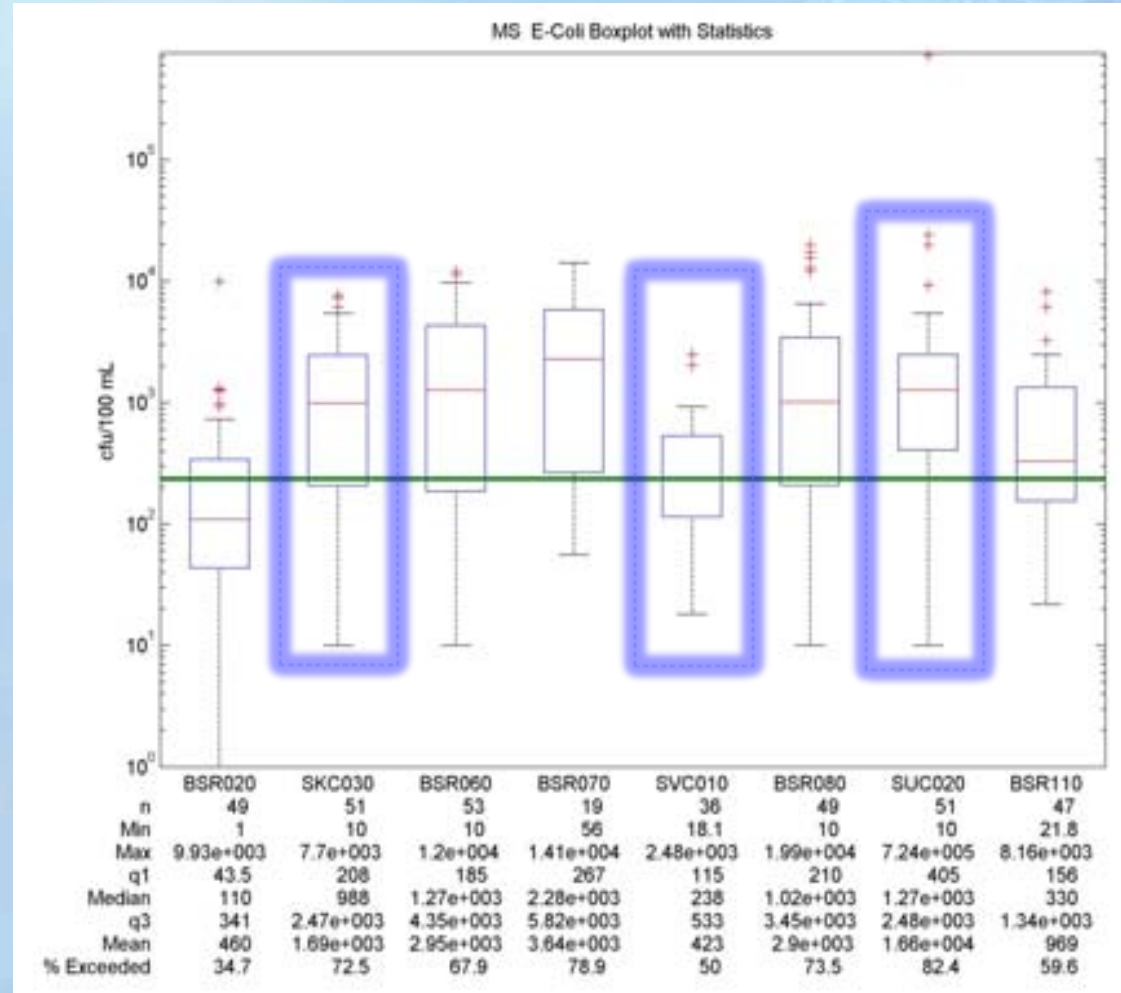
Phase 2: Current Monitoring

v Urban Storm Water Sampling Sites



E. coli Concentrations

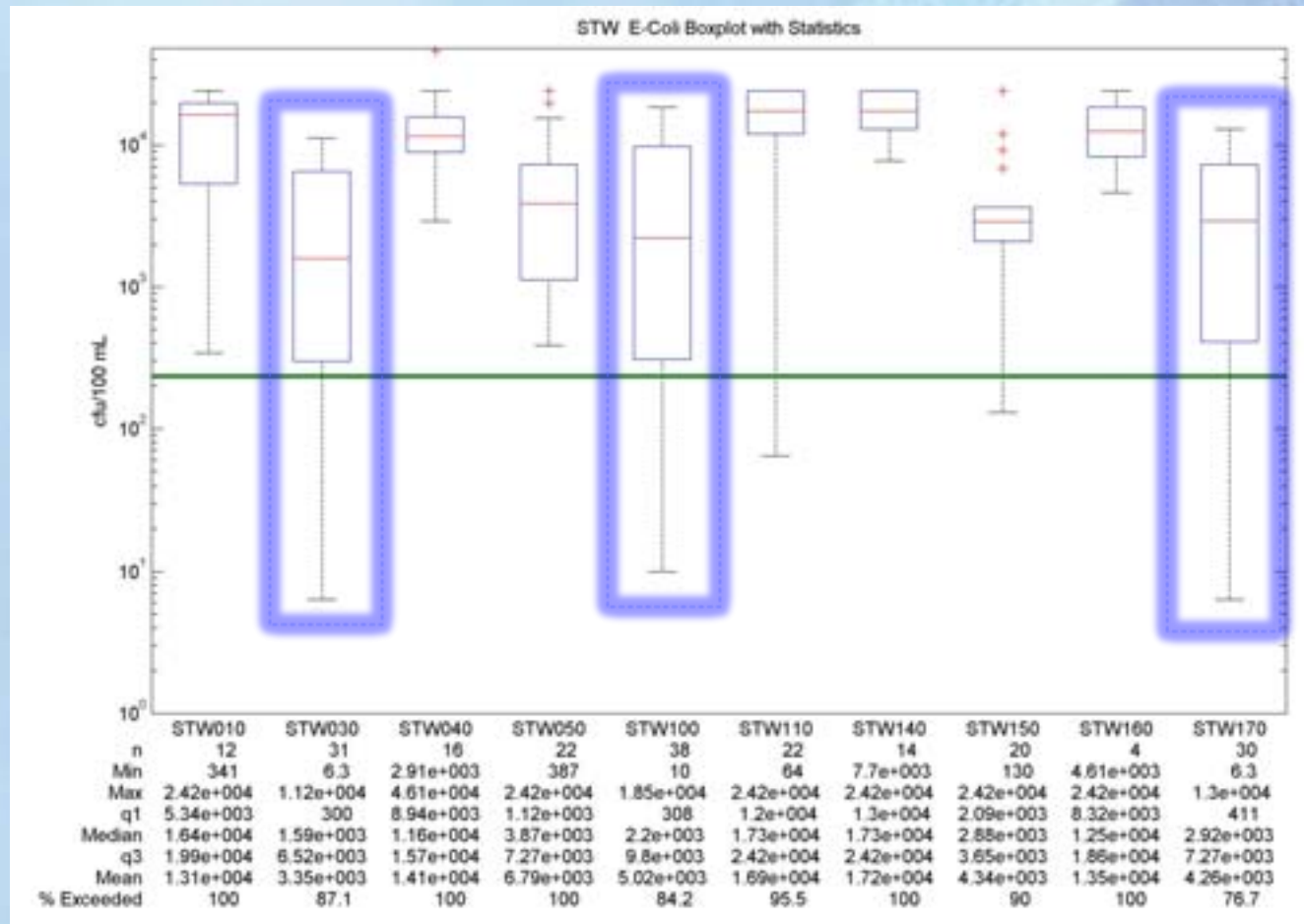
▼ Mainstem and Large Tributaries



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

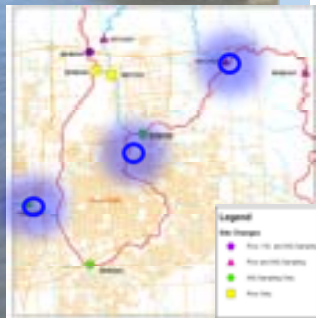
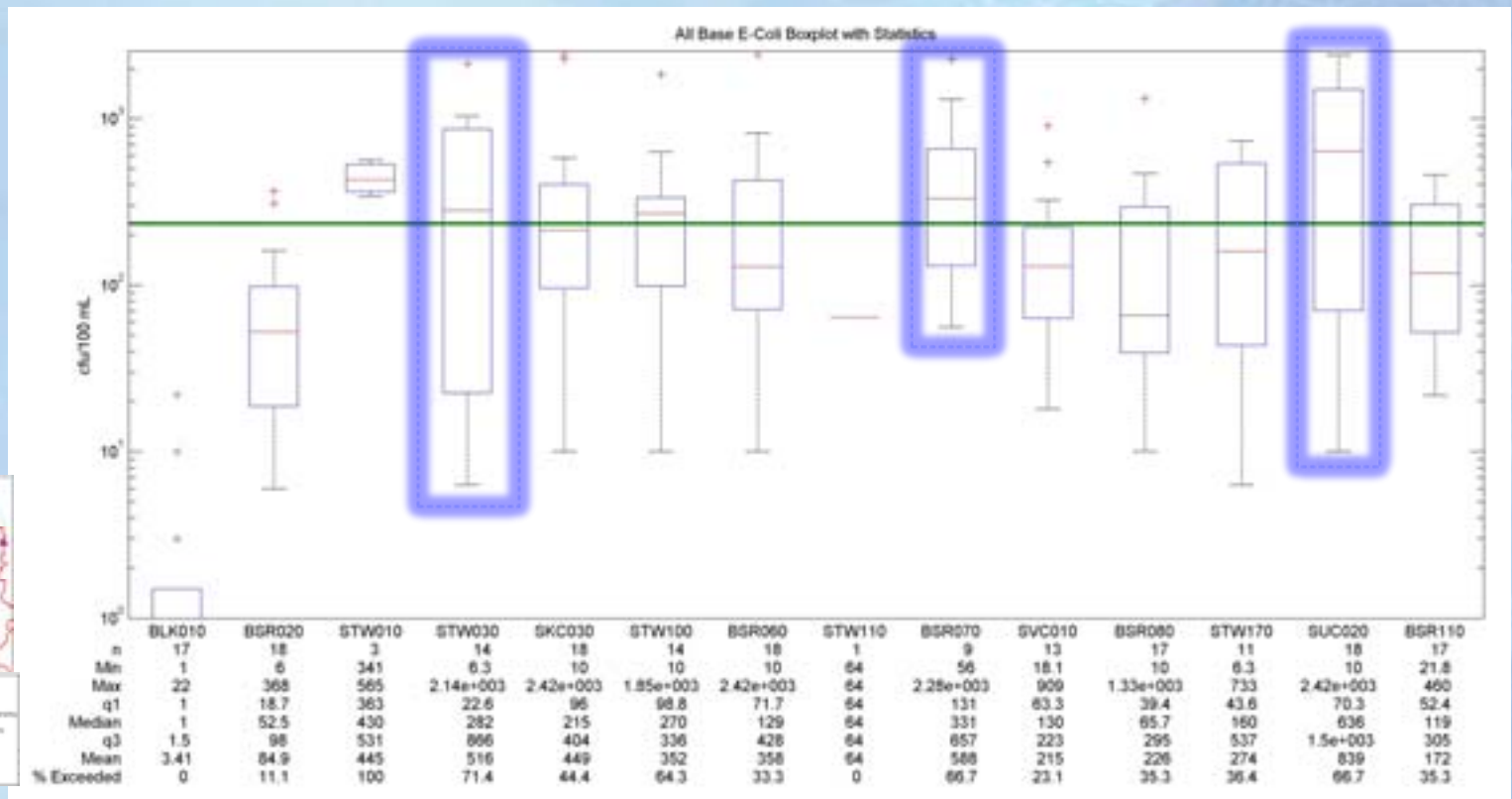
E. coli Concentrations

▼ Stormwater Outfall Sites



E. coli Concentrations

v Baseflow Concentrations – All Sites

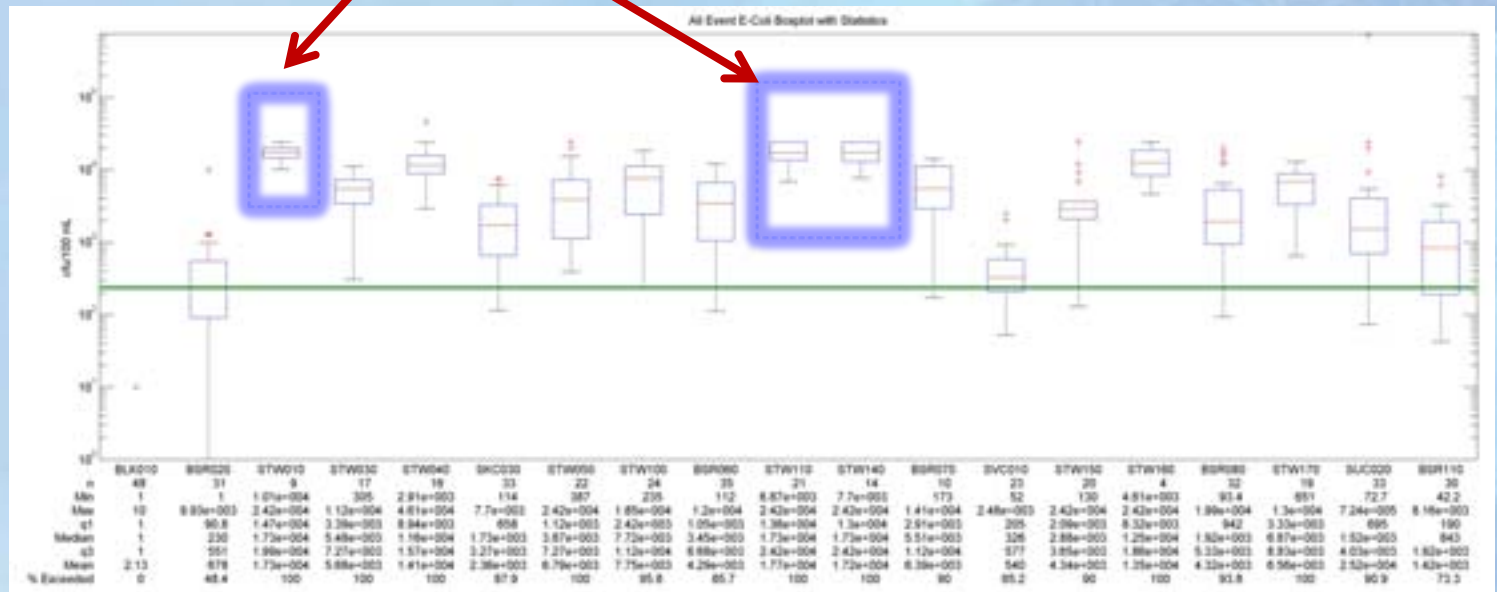


***Water Quality Standard only applies to the Big Sioux River**

E. coli Concentrations

v Storm Event Concentrations – All Sites

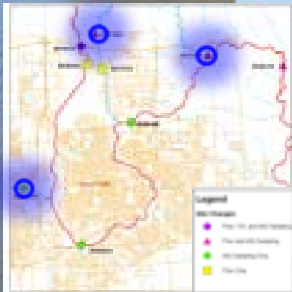
Old Residential Areas



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

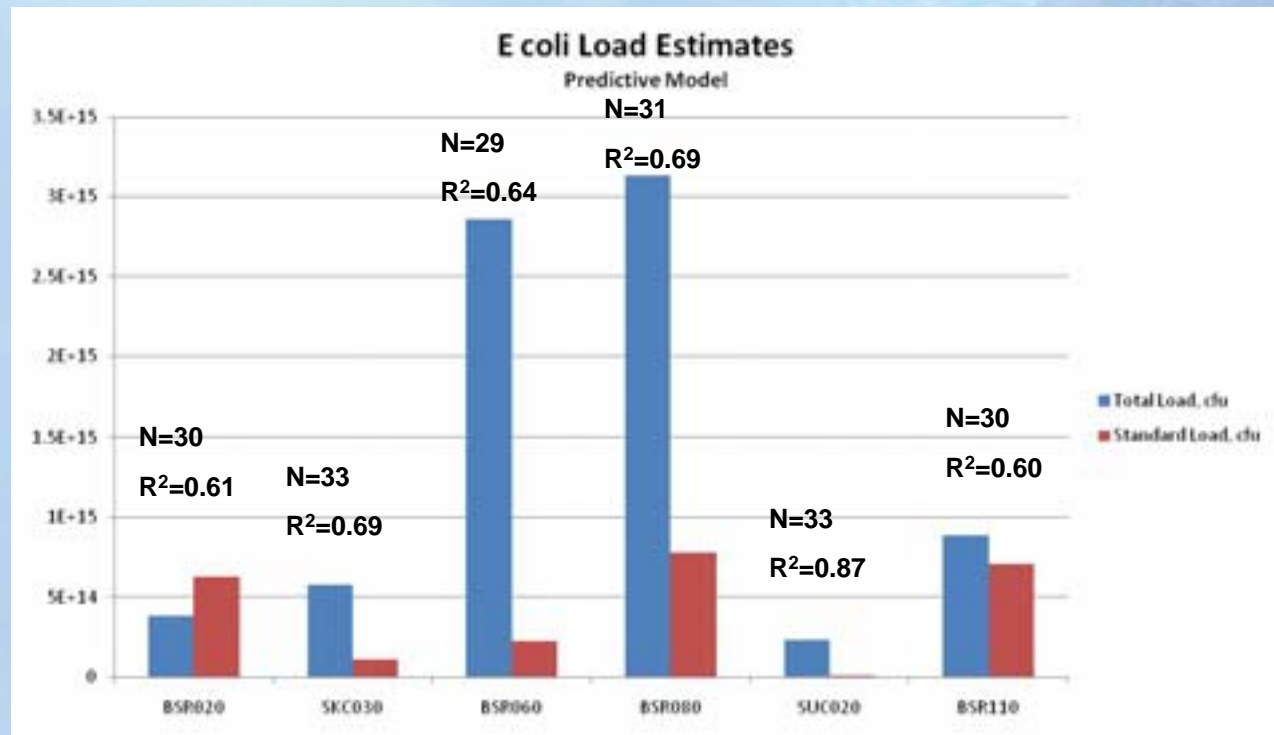
Urban Watershed Locations

v Drainages for older residential sites



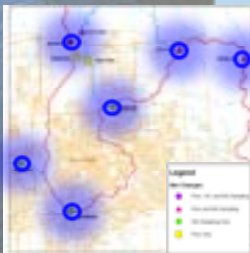
E. coli Loads

2009 Seasonal Load Estimate



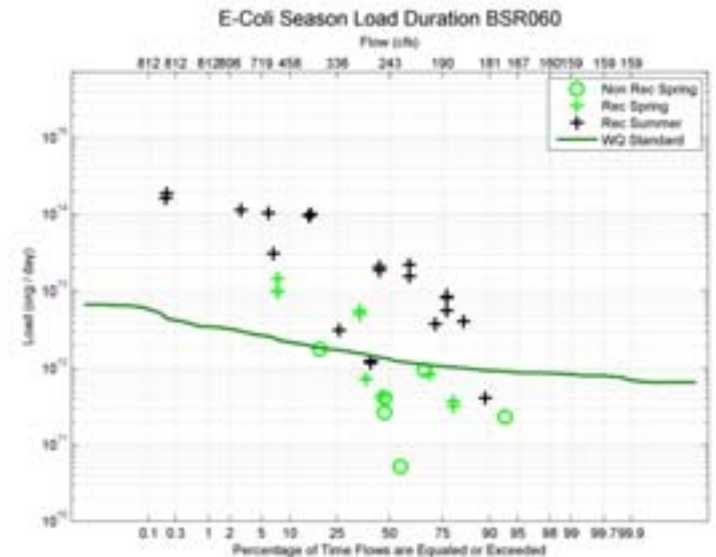
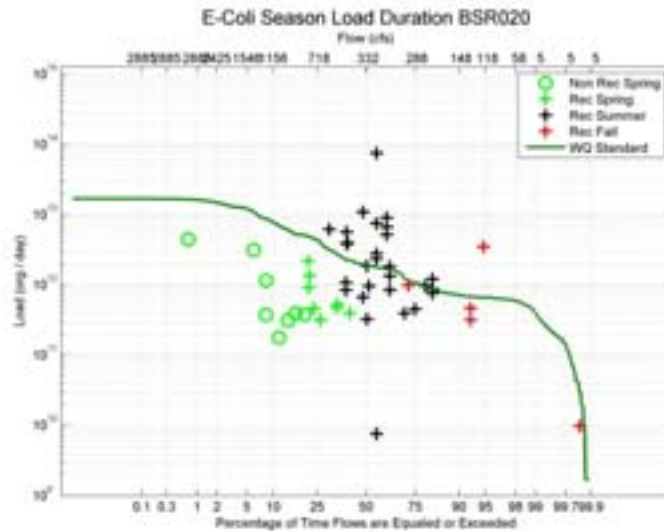
Upstream

Downstream



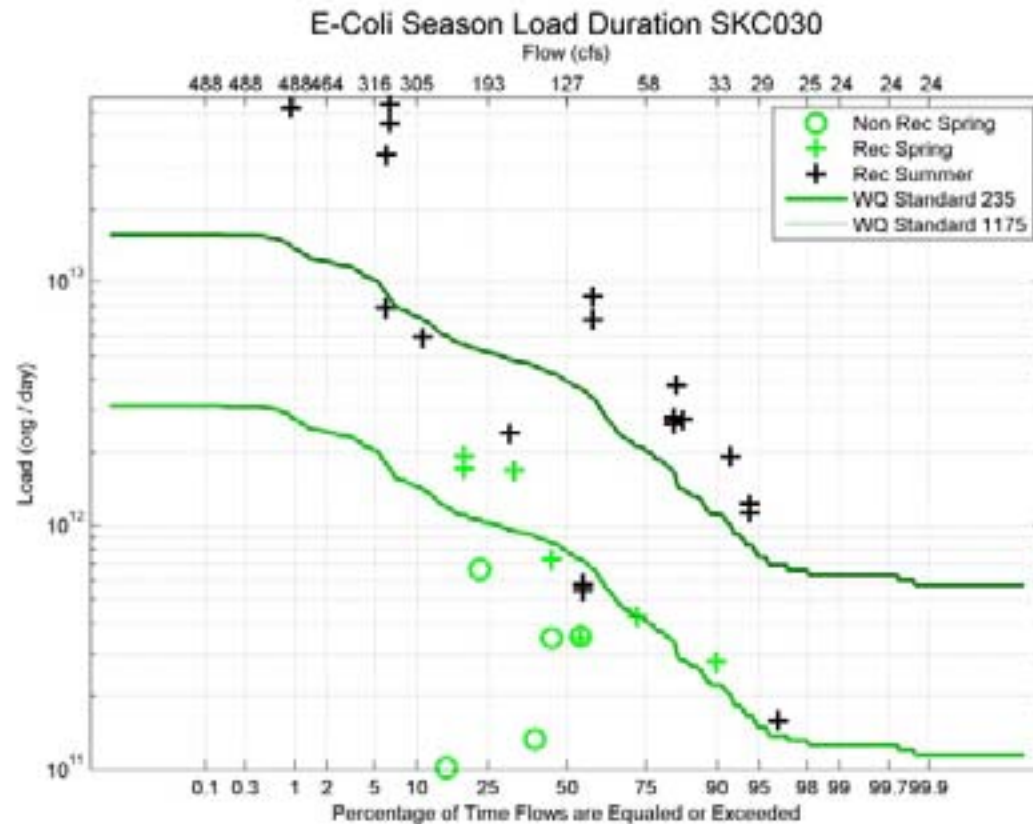
Bacteria Results: Mainstem

▼ Load Duration Curves



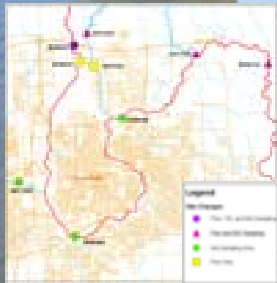
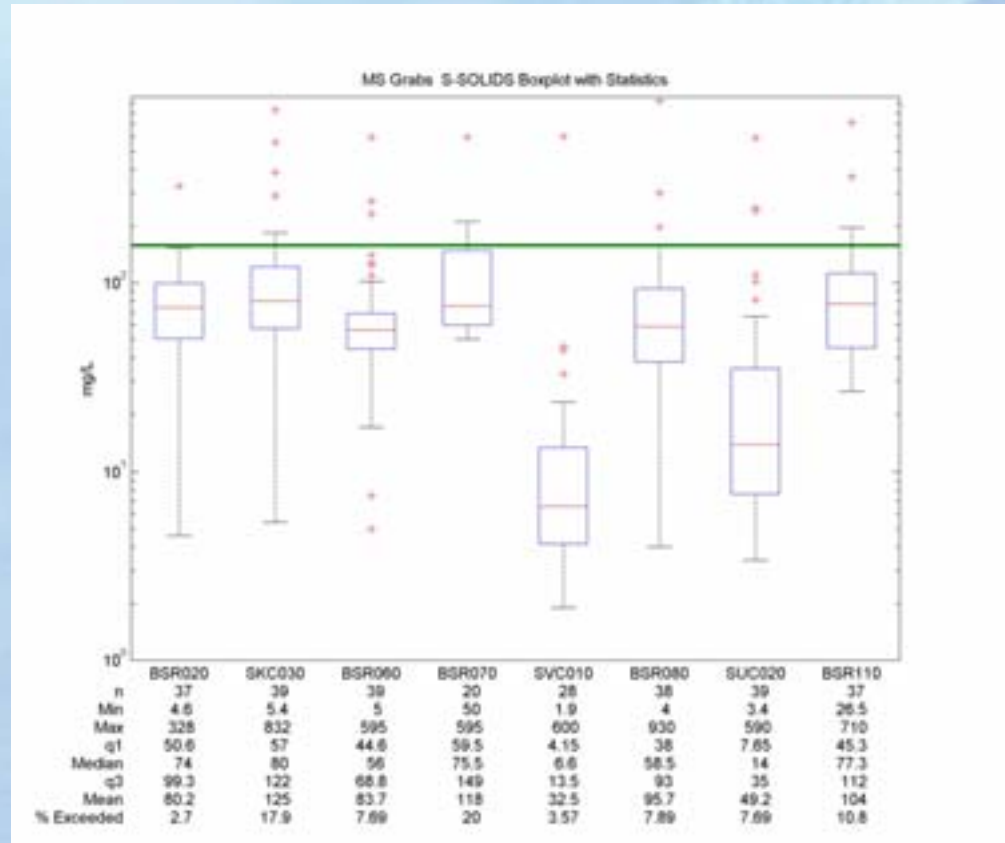
Bacteria Results: Mainstem

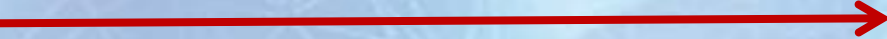
v Load Duration Curves



TSS Concentrations

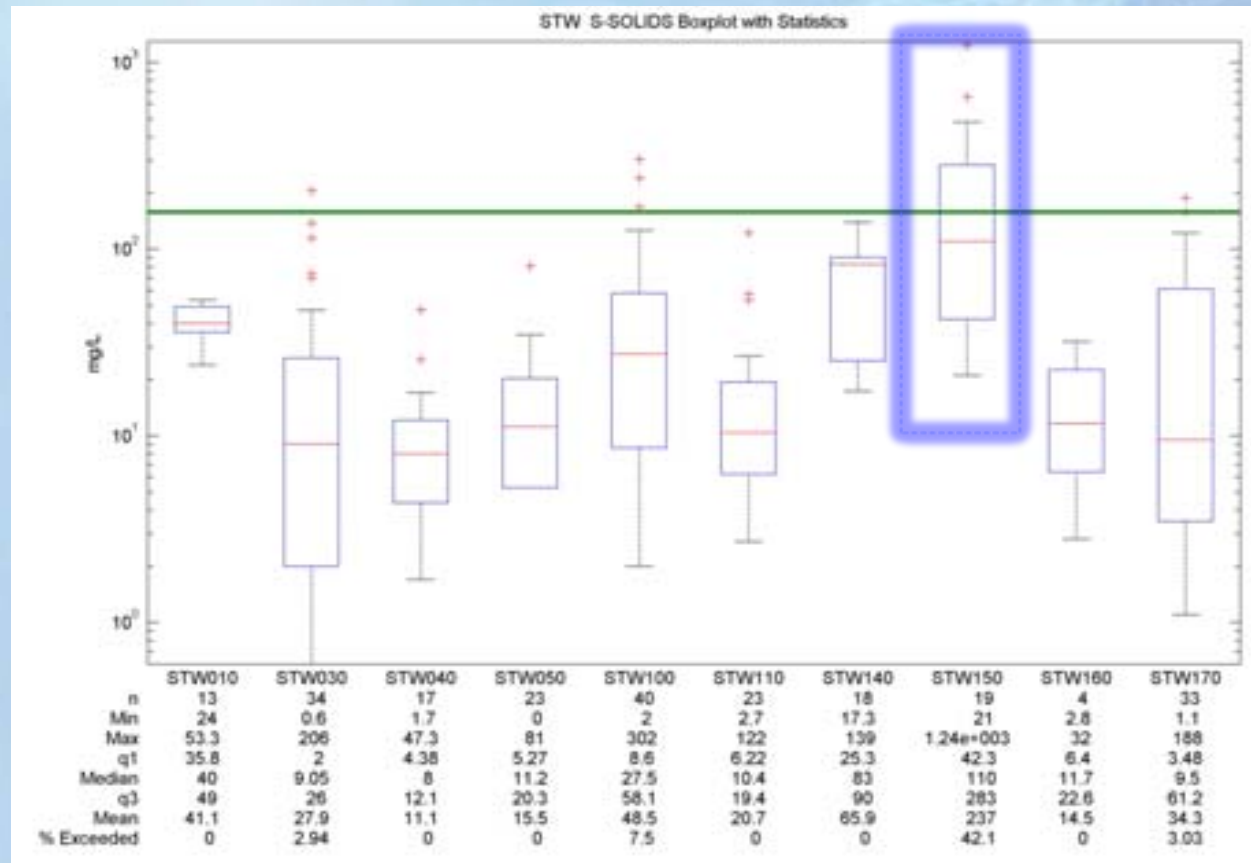
▼ Mainstem Sites (grab samples only)



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

Sioux Falls Urban Storm Drains

Benson Road



N 43° 35.259' W 096° 43.528'

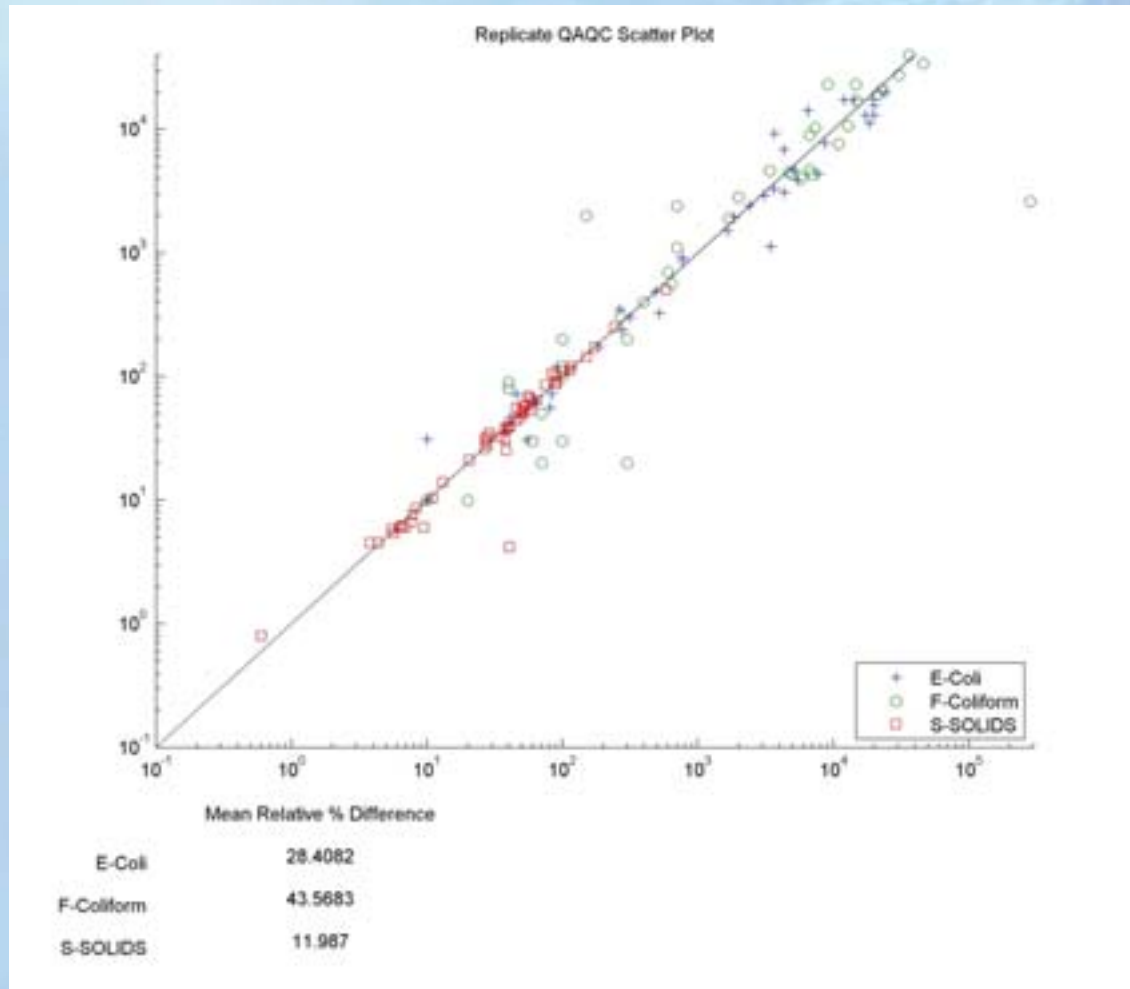
1447 ft

03/24/2009 8:43:49 AM



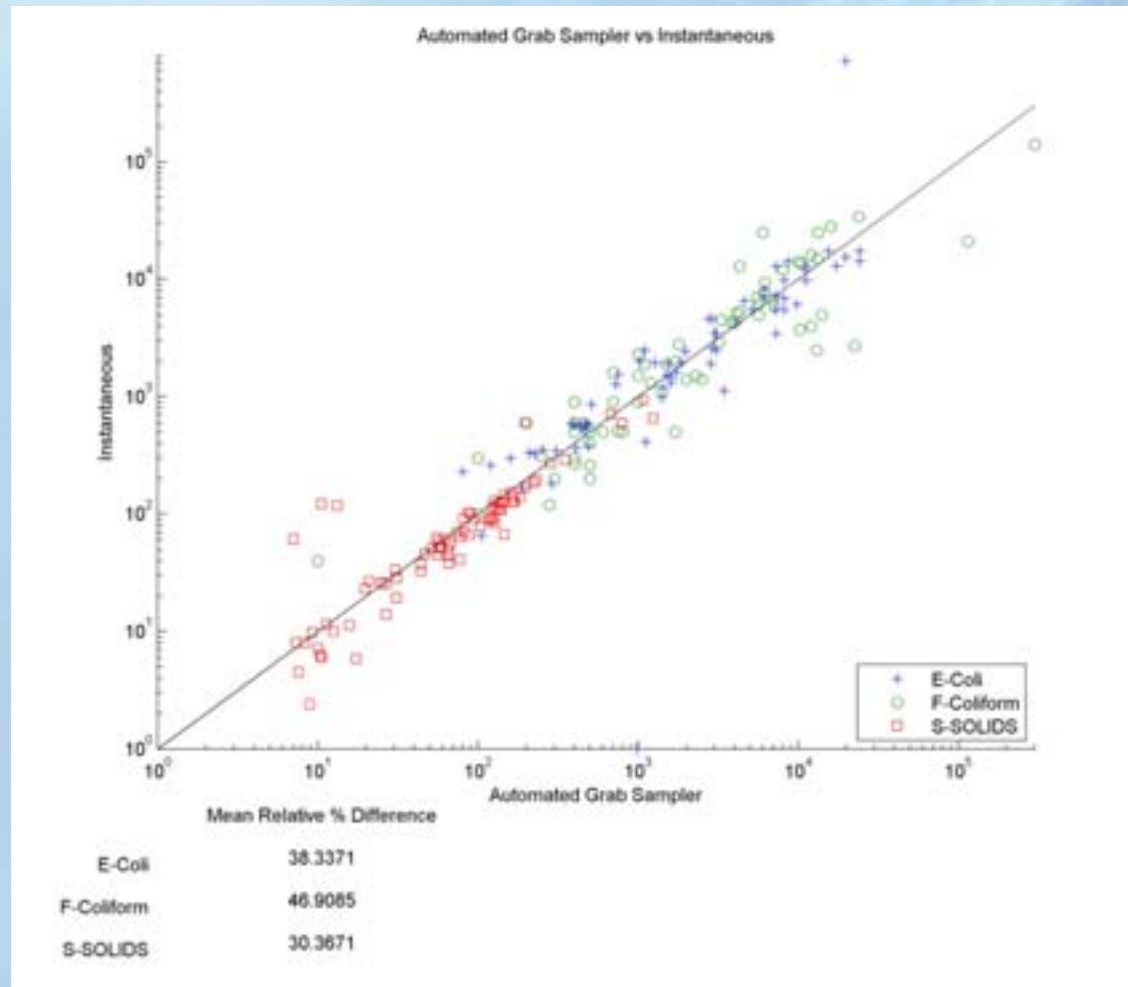
Field Sampling QA/QC

Field Replicate Comparison



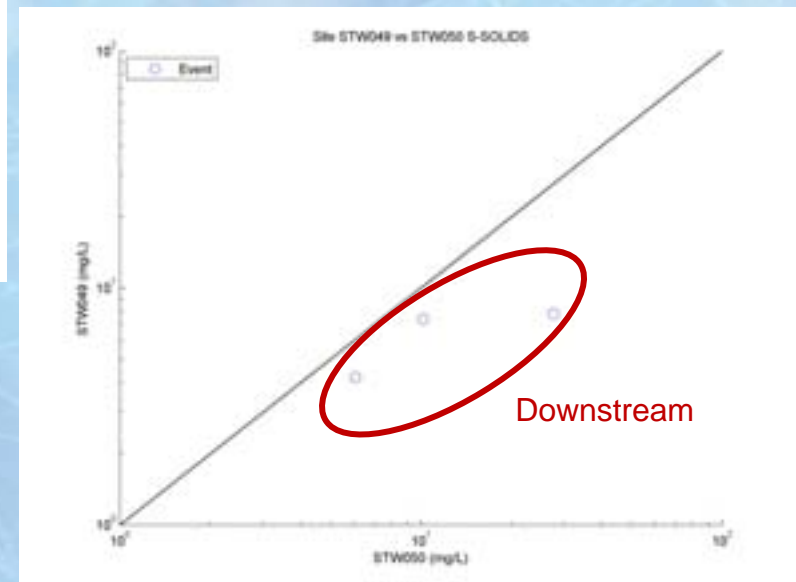
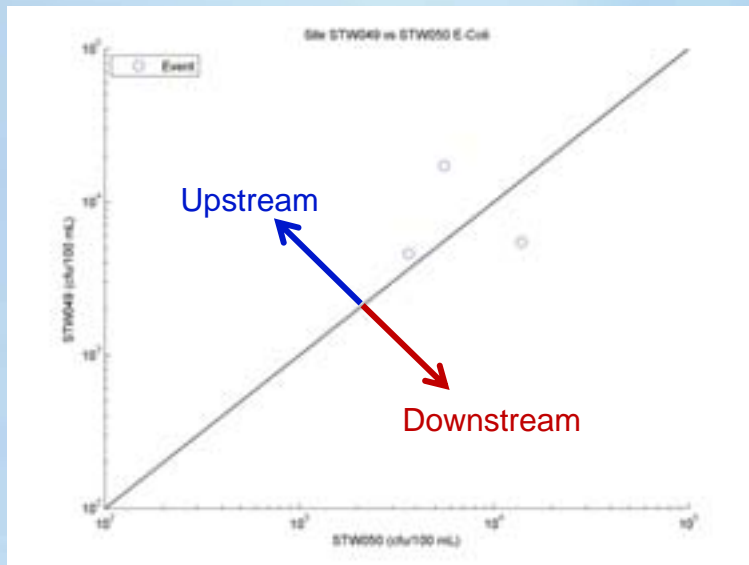
ISCO QA/QC

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?

