



Chunky River Watershed Monitoring Plan

Results

Matthew Hicks
USGS, MS Water Science Center



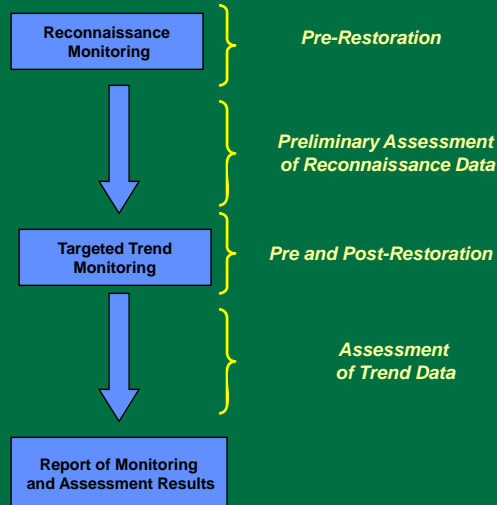
U.S. Department of the Interior
U.S. Geological Survey

Purpose of Monitoring

- Assist Watershed Implementation Team (WIT) with:
 - identifying causes (pollutants) of impairment for 303(d) listed waters
 - identifying extent of impairment and possible sources
 - identifying locations of other waters that may need protection/restoration efforts
 - identifying areas for and types of restoration efforts
 - documenting changes in water quality and select locations



Overall Monitoring Concept



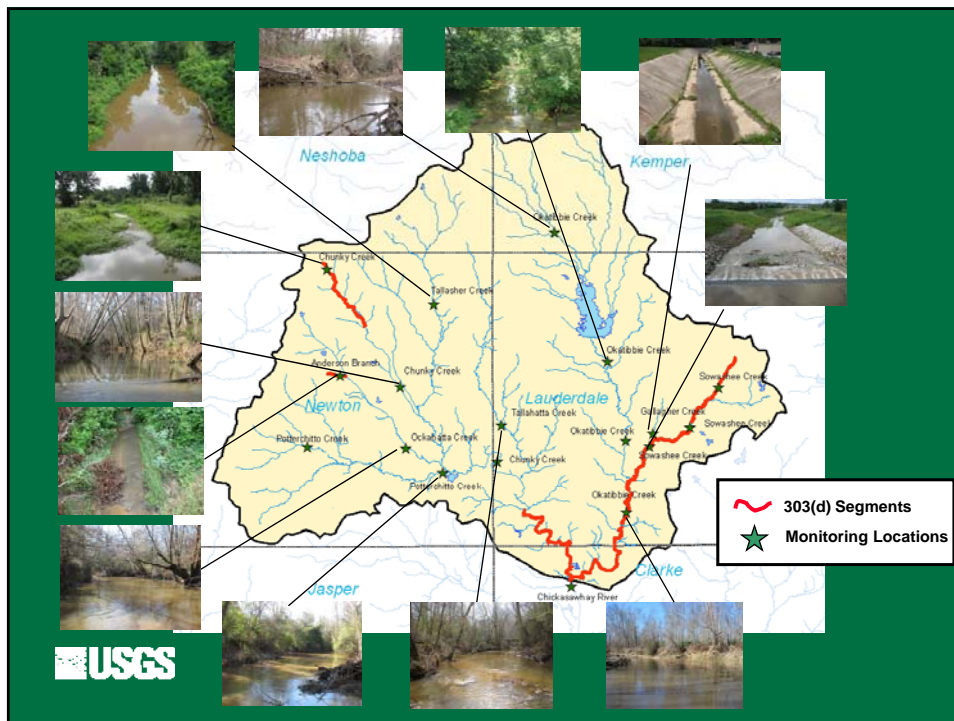
Monitoring

- **Reconnaissance Monitoring**
 - Broad spatial scale
 - Broad range of indicators
 - One high-flow and one low-flow sampling event
- **Targeted Trend Monitoring**
 - Use Reconnaissance Monitoring to develop monitoring strategy
 - Smaller scale
 - Less stations
 - More data collection per station
 - Location based on areas identified for restoration efforts
 - Indicators based on pollutants targeted for abatement



Reconnaissance Monitoring

- 18 monitoring stations selected based on:
 - 303(d) Listed Waters
 - Broad basin coverage
 - Areas of concern outlined in Watershed Implementation Plan
 - Areas of minimal disturbance
- Indicators
 - Flow, Sediment Concentration, Nutrient Concentration, In-situ Field Parameters
 - Summer 2007 (low-flow) and Winter 2008 (high-flow)
 - Biological Community, Habitat Assessment, Substrate Particle Size
 - Winter 2008



Reconnaissance Monitoring Results

- **Biological Health**

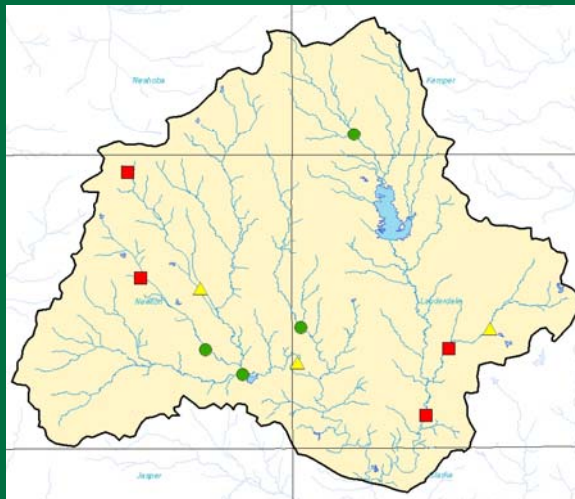
- Many sites sampled reflect healthy aquatic communities (benthic macroinvertebrates)



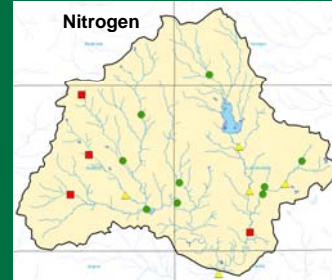
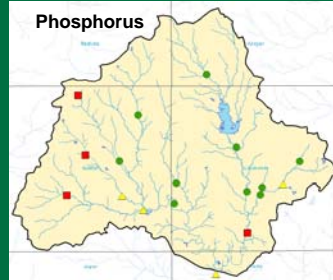
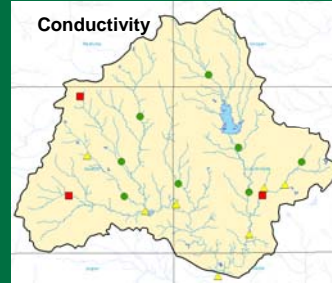
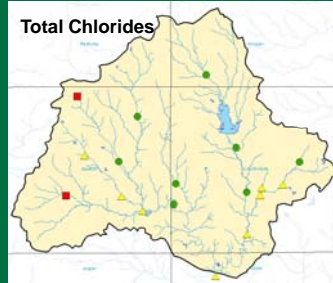
- A few sites suggest aquatic communities under stress, mainly around urban areas



Macroinvertebrate Richness and Diversity



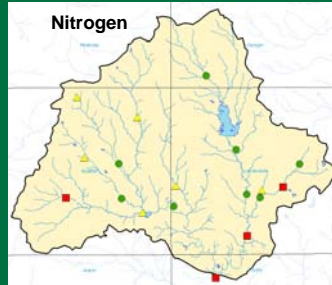
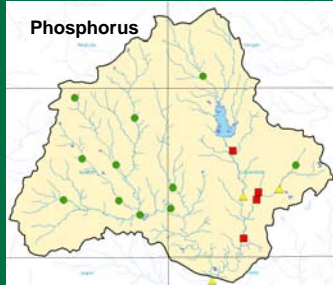
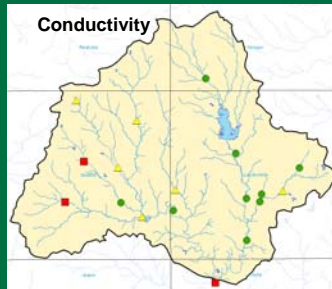
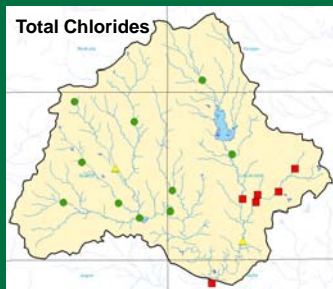
Low Flow Chemical



- High
- Medium
- Low



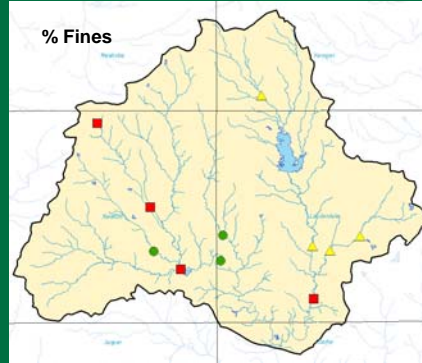
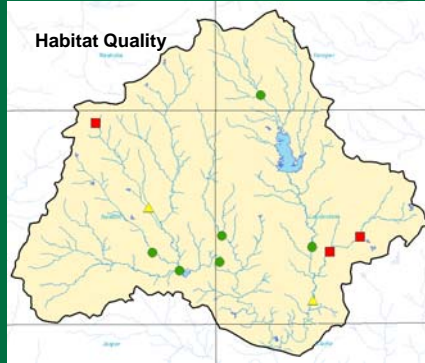
High Flow Chemical



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- Medium
- Low



Habitat

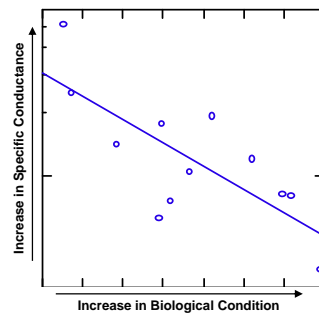
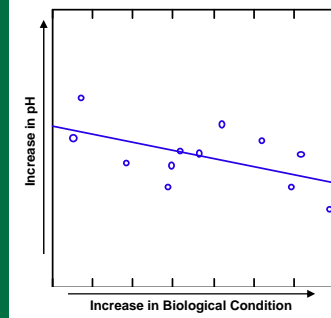
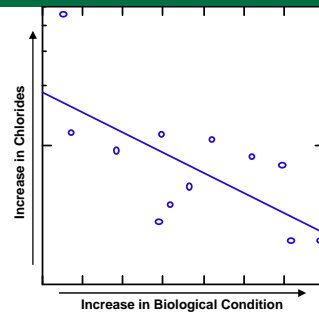
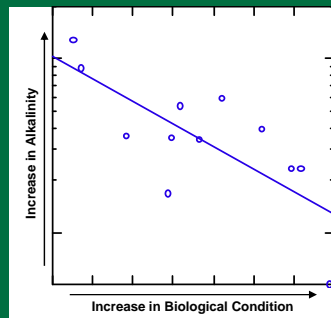


- High
- ▲ Medium
- Low

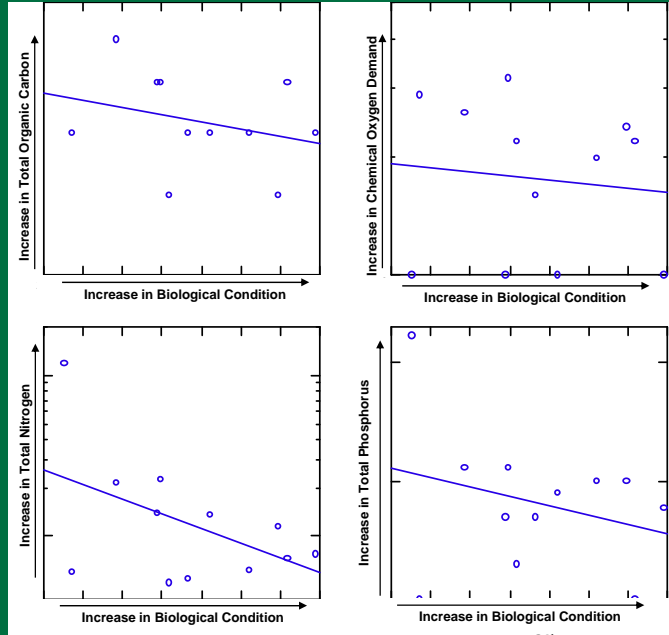


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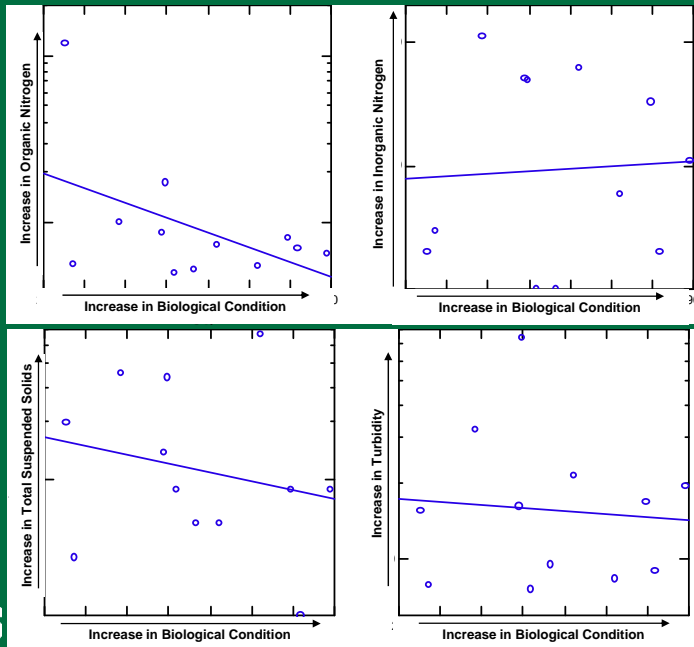
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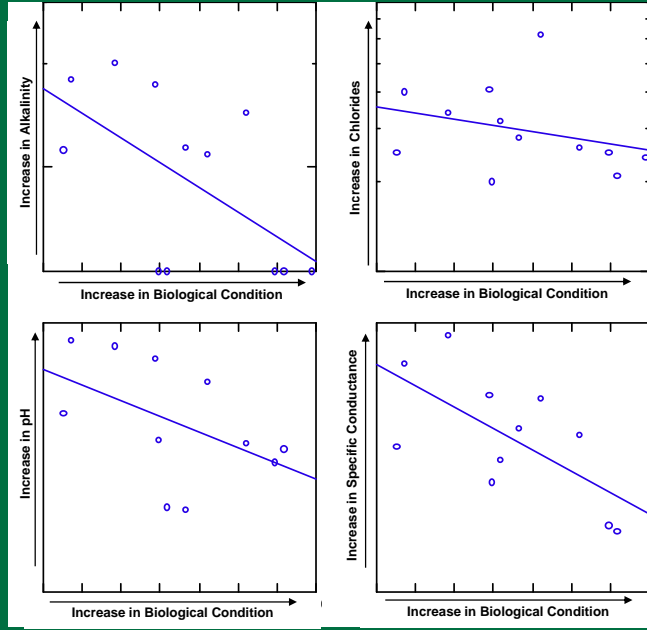
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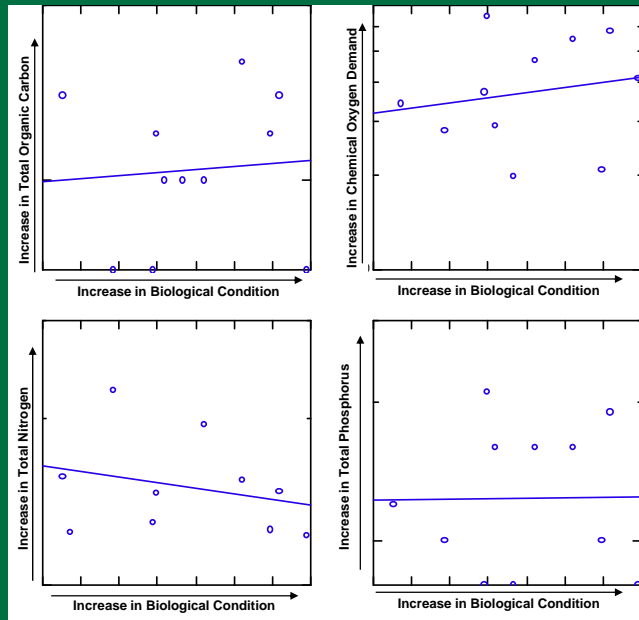
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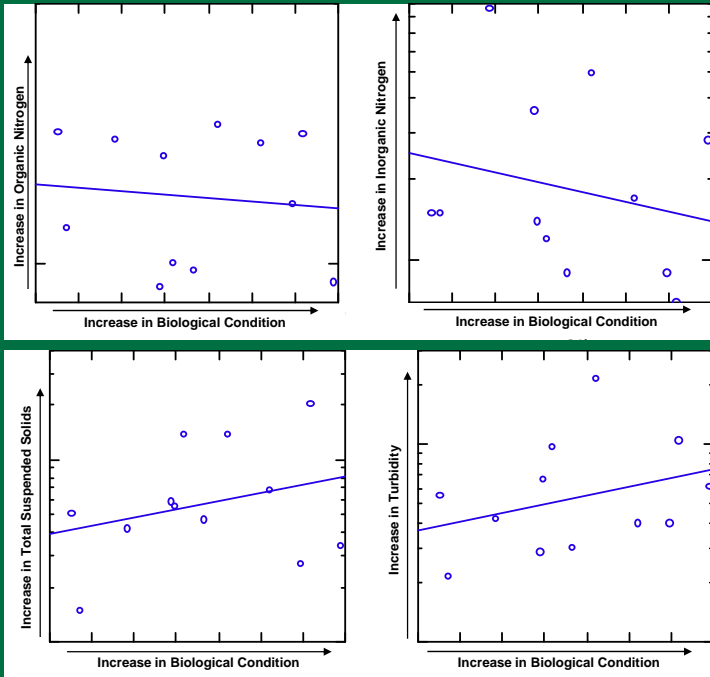
High Flow



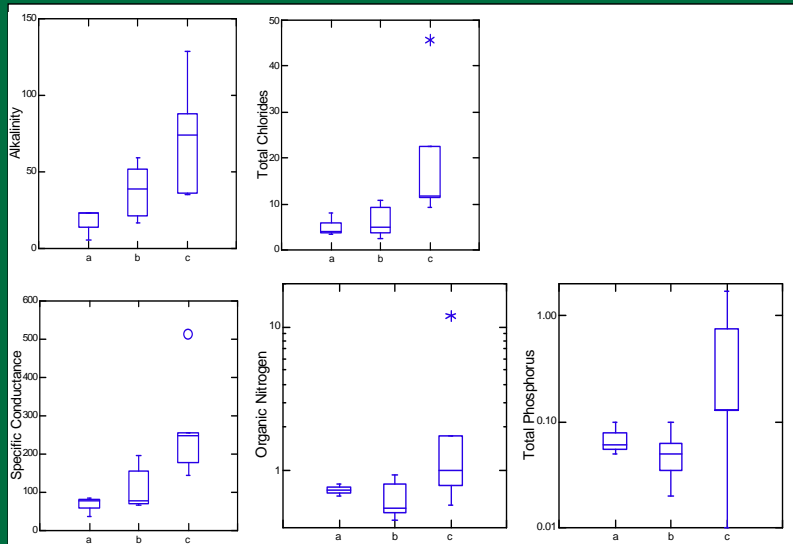
High Flow



High Flow



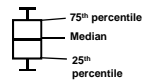
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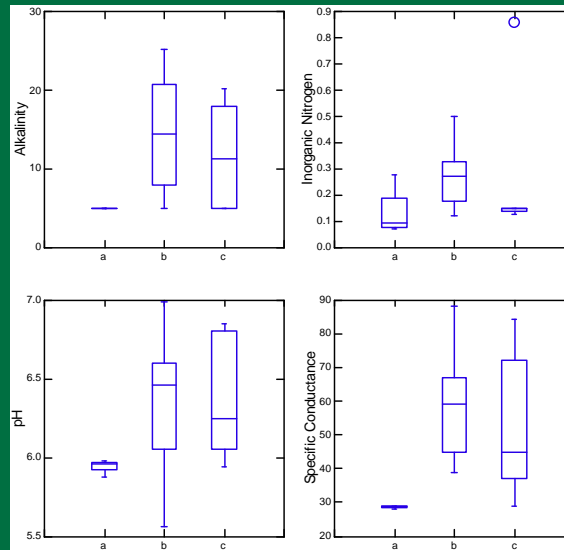
Groups

- a = high biological diversity
- b = medium biological diversity
- c = low biological diversity

Box = range of y axis values



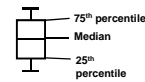
High Flow



Groups

a = high biological diversity
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c = low biological diversity

Box = range of
y axis values



Reconnaissance Monitoring Results

- **Summary**
 - Many healthy sites in watershed
 - Sites with poor biology may be associated with Point Source discharges and Habitat alteration
 - Sites with fair biology may be more associated with Non-Point source pollution



Next Steps for Watershed Implementation Team

- **Identify areas for restoration and/or protection**
- **Identify specific stressors of waters in need of restoration**
- **Design monitoring plan based on funding**

