

# **Application of Rapid Bioassessments in Phase I MS4 Permit Monitoring**

Presented by  
Cathy Matthews and Cody Whittenburg  
Code Compliance/Environmental  
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# Presentation Objectives

- Review monitoring requirements and options
- Regional and the city's plan
- Using bioassessments in a monitoring program




# Texas NPDES Stormwater Permitting

- Texas issues the permits
- The Stormwater permit has three options for storm event monitoring

		TPDES PERMIT NO. WQ0004350000 <i>[For TCEQ office use only – EPA I.D. No. TXS000901]</i>
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY P. O. Box 13087 Austin, Texas 78711-3087		
PERMIT TO DISCHARGE UNDER THE TEXAS POLLUTANT DISCHARGE ELIMINATION SYSTEM under provisions of Section 402 of the Clean Water Act and Chapter 26 of the Texas Water Code		This permit supersedes and replaces TPDES Permit No. WQ0004350000, issued on February 22, 2006.
<b>PART I: AUTHORIZATION</b>		
City of Fort Worth 1000 Throckmorton Street Fort Worth, Texas 76102	Tarrant Regional Water District P.O. Box 4508 Fort Worth, Texas 76164	Texas Department of Transportation P.O. Box 6868 Fort Worth, Texas 76115
are authorized to discharge from the City of Fort Worth Municipal Separate Storm Sewer System (MS4) (SIC 9111).		
including all areas, except for any agricultural lands, located within the corporate boundary of the City of Fort Worth served by, or otherwise contributing to discharges to the MS4(s) owned or operated by the permittees, located in Tarrant, Denton, Parker and Wise Counties, Texas, 76101-76124, 76126, 76127, 76129-76137, 76140, 76147, 76148, 76150, 76155, 76161-76164, 76166, 76177, 76179-76182, 76185, 76191-76193, 76195-76199 and 76244		
via the MS4 to various ditches and tributaries that eventually reach West Fork Trinity River Below Lake Worth, Lake Worth, West Fork Trinity River Below Eagle Mountain Reservoir, Eagle Mountain Reservoir, Grapevine Lake, Lake Arlington, Clear Fork Trinity River Below Benbrook Lake, Benbrook Lake, and Lower West Fork Trinity River in Segment Numbers 0806, 0807, 0808, 0809, 0826, 0828, 0829, 0830 and 0841 of the Trinity River Basin		
only according to conditions set forth in this permit, as well as the rules of the Texas Commission on Environmental Quality (TCEQ), the laws of the State of Texas, and other orders of the TCEQ. The issuance of this permit does not grant to the permittee the right to use private or public property for conveyance of storm water and certain non storm water discharges along the discharge route described in this permit. This includes, but is not limited to, property belonging to any individual, partnership, corporation or other entity. Neither does this permit authorize any invasion of personal rights nor any violation of federal, state, or local laws or regulations. It is the responsibility of the permittee to acquire property rights as may be necessary to use the discharge route.		
This permit shall expire at midnight, five years from date of issuance		
ISSUED DATE: July 29, 2011		
		 For the Commission

# **TPDES Storm Event Discharge Monitoring Options**

- Participate in the Regional Wet Weather Characterization Program
  - Conduct Representative Monitoring
  - Developing and implementing a Rapid Bioassessment Program
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# What are Bioassessments?

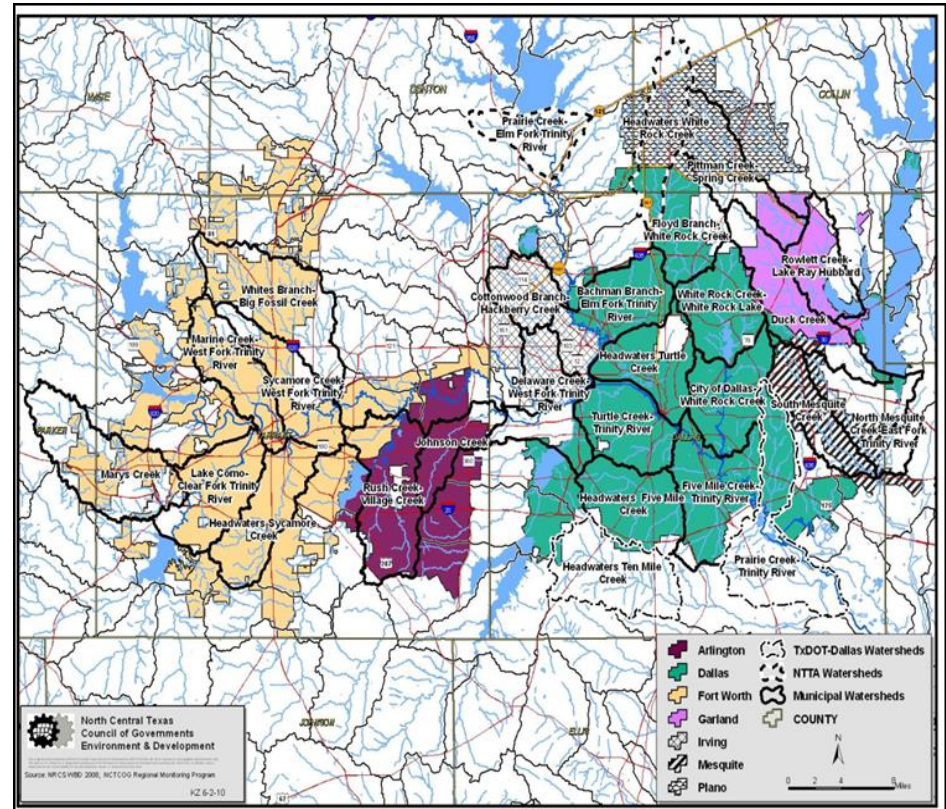
- Bioassessments use living organisms to assess or monitor environmental conditions






# TPDES Storm Event Discharge Monitoring Options

- Participate in the Regional Wet Weather Characterization Program



# **Regional Wet Weather Characterization Program**

- Each participating city monitors watersheds that cover at least 50% of their jurisdiction.
  - Overall goal is to assess the impact of stormwater runoff on area stream water quality.
  - Determine baseline data and long term water quality trends.
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# Regional Wet Weather Characterization Program

- Chemical sampling during rain events
- Each city determines sampling locations






# Regional Wet Weather Characterization Program

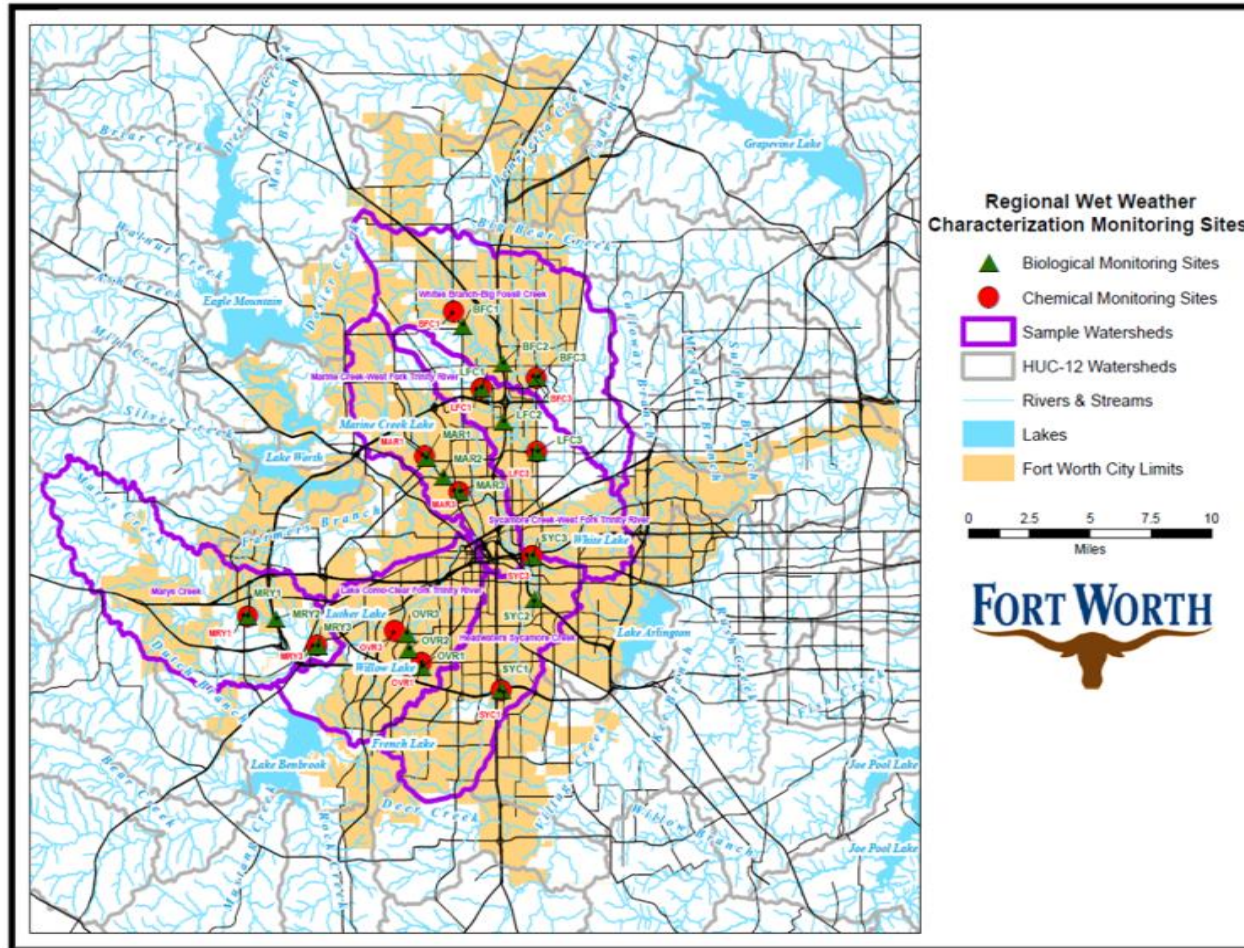
- Bioassessments are included and encouraged
- Bioassessments provide information about long term stream conditions



# Fort Worth's Individual Program

- Six watersheds which cover >50% of the city are monitored
  - Collect chemical samples at two sites on two streams each year of the permit term
    - The last two years sampling are based on the areas of most concern during as indicated in the first three years
    - >0.1" rain after a minimum of 72 hours dry
    - First flush and composite samples
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# Fort Worth's Individual Program



# Fort Worth's Bioassessment Program

- Bioassessments are done twice a year, late spring and fall
- At least two sites, preferably three, are assessed on each stream



# Fort Worth's Bioassessment Program

- Fort Worth's bioassessments include:
  - Physico-chemical sampling
  - Habitat assessments
  - Biological community
    - Macroinvertebrates (aquatic insects)
    - Fish (as resources allow)



# Fort Worth's Bioassessment Program

- Physico-chemical field tests:
- Include nutrients, flow, stream width, depth, DO, pH, conductance, turbidity, *E. coli*





# Fort Worth's Bioassessment Program

- Habitat assessments are performed at each site
- Assessing habitat aids in the interpretation of biological data



# Fort Worth's Bioassessment Program

- A Surber sampler is used to collect three macroinvertebrate samples at each site



# Fort Worth's Bioassessment Program

- Fish communities are collected as resources allow
- Collection is made at the downstream most site on each stream using a backpack shocker



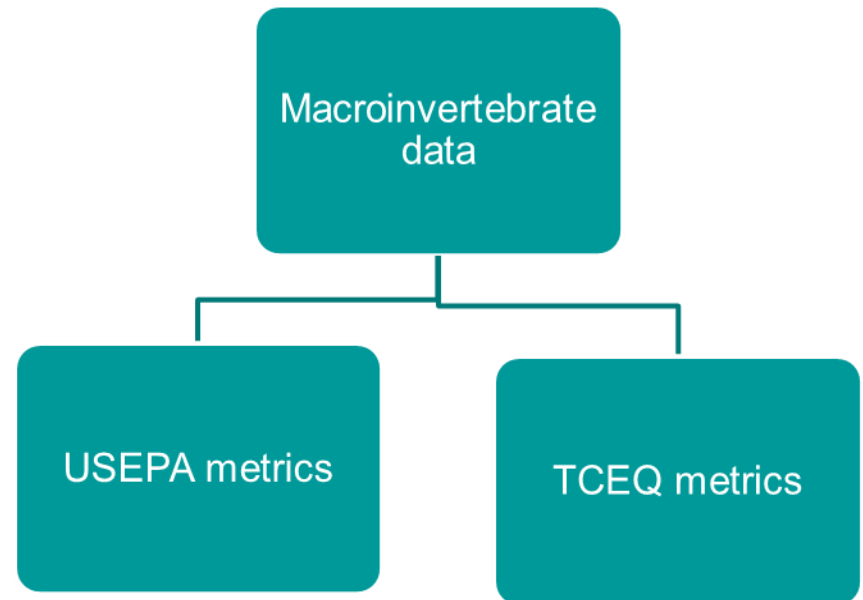
# Fort Worth's Bioassessment Program

- Seines are used as an additional method if necessary
- Collected fish are identified in the field and released back into the creek



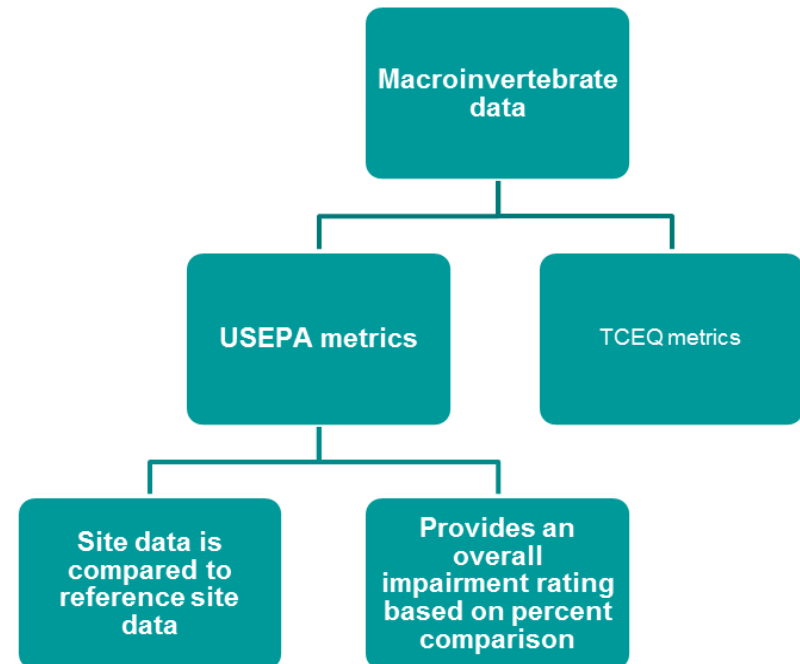
# Bioassessment Data Analysis

- Two methods are used to analyze the macroinvertebrate data



# Bioassessment Data Analysis

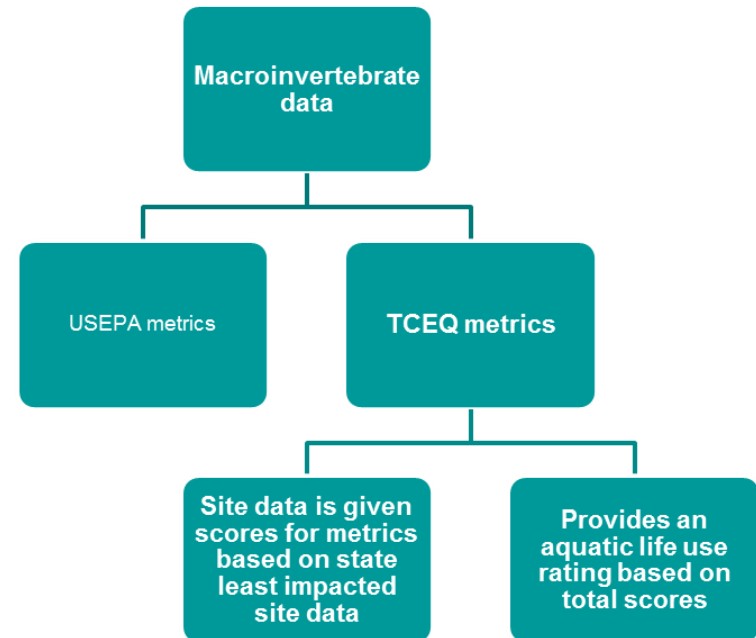
- One method was developed in Fort Worth based on USEPA guidelines





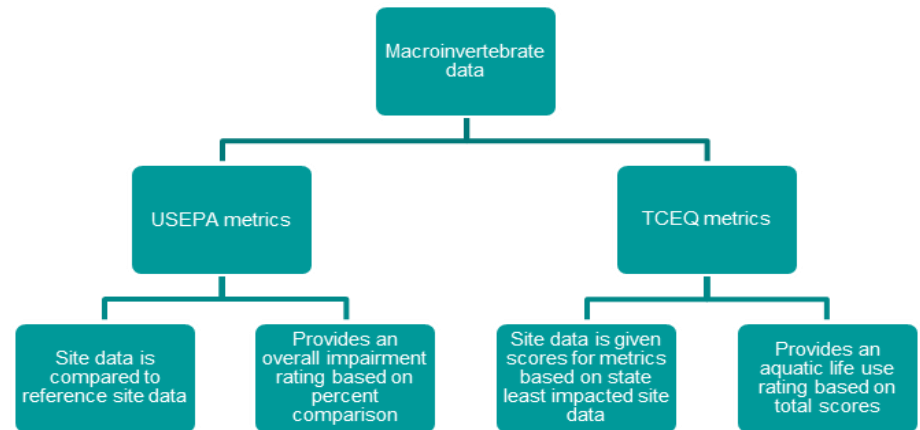
# Bioassessment Data Analysis

- The second method uses TCEQ methodology for surber samplers



# Bioassessment Data Analysis


- The two sets of metrics provide an in-depth assessment of the macroinvertebrate communities' health in Fort Worth's streams



# Bioassessment Data Analysis

- Fish data are analyzed using methodology referenced in the TCEQ guidelines
- Complete data analysis methodology is found in a TPWD document:
  - *Regionalization of the Index of Biotic Integrity for Texas Streams*. Linam, G., Kleinsasser, L., and Mayes, K. Resource Protection Division, Texas Parks and Wildlife, June 2002.

# Current State and Federal Guidance Documents

- *Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition.* EPA 841-B-99-002, 1999.
  - *Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data.* TCEQ, RG-416, revised May 2014.
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# Questions?



**IT'S A QUESTION PARTY!**

**MY FAVORITE!**

# **Application of Rapid Bioassessments in Phase I MS4 Permit Monitoring**

Cathy Matthews and Cody Whittenburg  
Code Compliance/Environmental  
817.392.5440/817.392.5455  
Cathy.Matthews@fortworthtexas.gov  
Cody.Whittenburg@fortworthtexas.gov



**CODE COMPLIANCE**  
ENVIRONMENTAL MANAGEMENT