Milwaukee River Basin

- Kinnickinnic River Watershed
- Menomonee River Watershed
- Milwaukee River Watershed
  - Cedar Creek Subwatershed
  - East & West Branches Milwaukee River Sub
  - Milwaukee River South Subwatershed
  - North Branch Milwaukee River Subwatershed
Water Quality Parameters

- Water Temperature
- Dissolved Oxygen
- Turbidity / Transparency
- pH
- Total Phosphorus
- Chloride / Conductivity (Road Salt)
- Bacteria (E. coli, fecal coliform)
Data Sources

- Milwaukee Riverkeeper Volunteer Stream Monitoring Program (2013 - 90 locations)
- Milwaukee Metropolitan Sewerage District (MMSD) - KK, Menomonee, Milwaukee River South
- Wisconsin Department of Natural Resources (WDNR) Field Biologists
Grading Standards

- Wisconsin State Statute—Water Quality Standards
- Environmental Protection Agency (EPA) Standards and guidance
- Scientifically accepted standards for healthy aquatic ecosystems and for Warm Water Sport Fisheries (WWSF)
Chloride

- 2013 Results very different from previous years
- MRK only monitors in winter (road salt season) MMSD monitors year round
- Milwaukee River South Subwatershed
  - MRK had 8 samples, with only 3 meeting acute and/or chronic levels (37.5%)
  - MMSD had 684 samples with 661 meeting the standards (96.6%)
Phosphorus

• North Branch Milwaukee River Subwatershed has high levels of Total Phosphorus; the remaining water quality indicators are excellent.

• According to WDNR 2001, Agriculture makes up 57% of land use in the North Branch Milwaukee River Subwatershed.

• Residual fertilizer and other organic matter most likely the reason for high levels.
Human bacteroides

- 2008 - current
- Dr Sandra McClellan Lab, UW School of Freshwater Science - analyze samples
- Monitor stormwater outfalls (where stormwater empties directly into the stream)
- Genetically identify and quantify bacteria specific to the human gut
Human bacteroides

- 2008 - 2012 focused primarily on Menomonee River Watershed
- 2013 focused exclusively on Kinnickinnic River Watershed, mainly on the Kinnickinnic River
- Levels over 1,000 CN / 100 mL considered significant contamination
- 59% of samples > 1,000 CN / 100 mL
Menomonee River Watershed: Human Bacteroides High Counts & Historic Urban Growth

Human Bacteroides
High Count (2008-2012)
(CN / 100 mL)
- 0 - 1,000
- 1,000 - 10,000
- 10,000 - 100,000
- 100,000 - 1,000,000
- over 1 million

Historic Urban Growth
- Other
- 1850 - 1899
- 1900-1919
- 1920-1939
- 1940-1949
- 1950-1959
- 1960-1969
- 1970-1979
- 1980-1989
- 1990-1999
- 2000-

- Municipal Boundary
- Watershed Boundary
- Stream
- Street
- Lake Michigan

Milwaukee
Wauwatosa
Menomonee River Watershed

milwaukee RIVERKEEPER

Map depicting the Menomonee River Watershed with high count locations for Human Bacteroides and historical urban growth data.
Kinnickinnic River Stormwater Sampling Results - 2013
(Highest Human Bacteroides Counts Per Outfall)
Macroinvertebrates

- "macro" - seen with the naked eye
- "invertebrate" - lacking a backbone
- Live on stream bottoms portion of life
- Insect larvae, worms, snails, mollusks, crustaceans, among others
- Base of a stream "food chain"
- Abundant, not very mobile, makes them ideal for assessing stream health over the long term.
Macroinvertebrates

- Entry level volunteers identify aquatic macroinvertebrates twice a year
- Use protocol (dichotomous key) developed by the WDNR and UW-Extension
- Most advanced volunteers no longer test for macroinvertebrates; not part of protocol
- DNR hopes to expand volunteer macroinvertebrate monitoring in 2015 to supplement other water quality data
Macroinvertebrates

• Recent removal of concrete (Kinnickinnic and Menomonee Rivers) should provide more habitat and attachment sites for macroinvertebrates, potentially improving overall aquatic health of these stream sections
## 2013 Water Quality Grades by Watershed / Subwatershed 2010 - 2013

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