COMPARISON OF INDICATOR BACTERIA DENSITIES AND THEIR RELATION TO TURBIDITY IN KANSAS STREAMS

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Biographical Sketch of Authors
All three authors are employed by the U.S. Geological Survey District Office in Lawrence, Kansas. Patrick Rasmussen and Victoria Christensen are hydrologists and are involved in real-time water-quality monitoring projects across Kansas. Andrew Ziegler is the Hydrologic Investigations Section Chief and Water Quality Specialist. All three authors have contributed to the use of real-time water quality monitoring and statistical analysis to continuously estimate constituent concentrations and loads in Kansas.

Abstract
The sanitary quality of water for use as a public-water supply and for recreational activities, including swimming, wading, boating, and fishing, can be evaluated on the basis of densities of indicator bacteria such as fecal coliform and Escherichia coli (*E. coli)*. This study evaluates the sanitary quality of surface water in select Kansas streams; describes the relationship between the current Kansas water-quality standard for fecal coliform and proposed U.S. Environmental Protection Agency (USEPA) recommended standard for *E. coli*; describes the relation of bacteria densities to turbidity; and provides methods for estimating bacteria densities on the basis of turbidity. Surface-water samples for fecal coliform and *E. coli* were collected at 28 sites in south-central and northeast Kansas. Of the 193 samples collected, 68 percent exceeded both the Kansas primary contact recreation standard for fecal coliform (200 colonies per 100 milliliters of water) and the proposed USEPA primary contact recreation standard for *E. coli* (126 colonies per 100 milliliters of water). Twenty-two of the 28 sites sampled could exceed the USEPA proposed *E. coli* standard more frequently than the fecal coliform standard. This study found turbidity to be a statistically significant indicator of bacteria densities. Continuous measurements of turbidity were used with regression models to continuously estimate densities of bacteria in near real time and are available via the Internet (http://ks.water.usgs.gov/Kansas/rtqw).