WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2004OK30B

Title: Evaluation of Chemical and Biological Loading to the Blue River

Project Type: Research

Focus Categories: Nutrients, Water Quality, Surface Water

Keywords: E.coli, water quality, TMDL, nutrients, Blue River

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Abstract

Rivers and streams contain a variety of microorganisms, including bacteria, viruses, protozoa, fungi, and algae. Most are naturally occurring and have little impact on human health. A few, however, do pose risks to human health, especially from those associated with human and animal feces. Bacterial water quality standards are guidelines for determining whether a fecal contamination indicator such as E. coli represent an acceptable risk. These levels are determined by the water use, e.g., drinking water, in which the standard is set at 1 CFU/100 ml. However, to accurately assess such risk, an understanding of the local environment and dominant mechanisms for bacterial survival is required. This background or native loading can then be used to assess the risk associated with anthropogenic loading as measured by increases in bacterial concentrations. Oklahoma's Blue River presents a unique opportunity to conduct this type of assessment because its genesis is the Arbuckle-Simpson aquifer and its watershed includes both undeveloped wilderness areas, trout fisheries, and developed areas, which

allows paired sampling to determine differential biological loads (concentrations as well as flux) and decay or turnover rate for bacteria both upstream and downstream of human impacts. The findings of this study will support Oklahoma's efforts to develop approprate risk-based criteria for bacterial contaminants in surface water.