Public Abstract
First Name:Eric Gentil
Middle Name:
Last Name:Mbonimpa
Adviser's First Name:Tom
Adviser's Last Name:Clevenger
Co-Adviser's First Name:
Co-Adviser's Last Name:
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Title:CHARACTERIZATION OF DISINFECTION BY-PRODUCT PRECURSORS FROM MISSOURI STREAMS

Surface and ground water, used as sources of drinking water, contain natural organic matter that reacts with chlorine to generate carcinogenic organic compounds. Many water treatment systems, which use chlorine in the disinfection process, face stringent regulations regarding two types of disinfection by-products (DBPs): trihalomethanes (THMs) and haloacetic acids (HAAs). Due to the challenge of understanding the complex mixture of organic compounds in natural organic matter, DBPs removal is still a research issue. UV and fluorescence spectroscopy methods of characterization were used in this study to characterize organic matter contained in Missouri streams. The relationship with DBPs formation potentials observed in water was also investigated. THMs and HAAs formation potentials, UV- absorbance at 254 nm wavelength, and Excitation and Emission Matrix parameters were taken for samples collected at 38 streams and creeks during the months of March, June, and September 2006. Fluorescence index, PARAFAC model and Fluorescence Regional Integration were used to interpret information obtained from fluorescent compounds in water. Organic matter scanned originated mainly from terrestrial source (allochthonous) rather than within water body (autochthonous) as shown by fluorescence index. Three fluorophores: humic-like, fulvic-like and protein-like were recognized from fluorescence scans. The variation in organic matter was mainly due to weather and the watershed source. The rainfall in the month of March carried terrestrial organic matter of high aromatic rings (high UVA254) into streams, which in turn generated high amounts of THMs and HAAs. The summer increased THMs but reduced HAAs. High amount of DBPs were observed in samples from northeastern Missouri Watershed. Chloroform was the dominant of THMs species (average: 90%) and, DCAA and TCAA were dominant HAAs species (average: 87%). Finally, fluorescence regional integration showed that algal and microbial derived compounds (protein-like), as well as humic substances, generate THMs and HAAs.