

The Characterization of Significant Direct Threats to Source Watersheds: A Risk-Based Approach

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Abstract

In 2004, the Ontario Ministry of the Environment proposed the *Drinking Water Source Protection Act* which stipulated that, in the development of source water protection plans, significant direct threats to source watersheds are to be identified. Examination of the major risk factors threatening water resources proved there are insufficient scientific data available to regulators to accomplish this task. Research showed *E.coli O157:H7*, *Salmonella*, *Giardia lamblia*, and *Cryptosporidium parvum*, and the sources of these pathogens in the environment are, qualitatively, significant direct threats to water resources. However, a quantitative characterization of significance depends on the failure probabilities of pathogen sources. Using the Ontario Spills Action Center data, the occurrence of failure was found to have a high non-zero probability. However, considerable uncertainties revealed in these data suggest that a better understanding of failure is critical to accurately characterize significant threats to drinking water resources.