JEP> Vol.3 No.8A, August 2012

OPEN ACCESS

Monitoring Recreational Waters: How to Integrate Environmental Determinants

PDF (Size:263KB) PP. 798-808 DOI: 10.4236/jep.2012.328095

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ABSTRACT

Recreational waters are associated with a higher risk of disease for people engaged in activities that bring them into contact with these waters. The primary cause of contamination of recreational waters is fecal microorganisms, which may originate from various sources and involve several modulating factors, making it a complex public health and en- vironmental issue. Monitoring recreational water quality should include two key components: Microbial water testing and monitoring environmental determinants associated with higher risks of contamination. Conducting both activities provides the foundation for a comprehensive assessment according to risk and the actual level of fecal pollution and thus could promote good management actions to ensure safe water quality. Nevertheless, monitoring of environmental determinants is rarely fully integrated in monitoring programs and is also harder to achieve, especially when water pol- lution is mainly associated with nonpoint sources. In order to achieve identification and monitoring of environmental determinants associated with fecal contamination of recreational waters, some specific steps should be followed and some questions must be answered. The objective of this review article is to present current knowledge on this topic and to suggest and discuss recommendations. Potential sources of contamination and factors able to modulate them should be identified and measured after the geographical area influencing fecal contamination of recreational water has been delineated. Statistical models have been developed to identify the relative importance of these environmental characteristics on fecal pollution of recreational waters but they do not allow for a full comprehension of the exact processes leading to this pollution, thus other methods should also be used to better understand these processes.

KEYWORDS

Recreational Waters; Fecal Pollution; Environmental Determinants; Monitoring

Cite this paper

P. Turgeon, "Monitoring Recreational Waters: How to Integrate Environmental Determinants," *Journal of Environmental Protection*, Vol. 3 No. 8A, 2012, pp. 798-808. doi: 10.4236/jep.2012.328095.

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