Pennington, Harding, Hendricks, Campbell. "Evaluating Microbial Indicators of Environmental Condition in Oregon Rivers." ***Environmental Management*****. 2001; 28(6): 833-841.** (Reviewed by Tracy Maloney)

This article describes the traditional bacteria indicators used in public health to assess the water quality of Oregon rivers. Water systems, including the Coastal Range, Willamette Valley, Cascades, and Eastern Oregon, were evaluated to compare their response to biological, chemical, and physical habitat indicators of stream condition. During the summers of 1997 and 1998, these Oregon river sites were sampled; the public health indicators included heterotrophic plate counts (HPC), total coliforms (TC), fecal coliforms (FC) and *Escherichia coli* (EC).

The article then describes the results of testing for the presence of these microbial bacteria, which pose significant risks to human health. Statewide, heterotrophic plate counts correlated strongly with the physical habitat surrounding the rivers, including the effects of elevation, canopy presence, and consequences of agriculture, pavement, road, pasture, and total disturbance. The chemistry of the water sites, including factors such as pH, dissolved O2, acid-neutralizing capacity, dissolved organic carbon, and total nitrogen and phosphorous, also showed a high correlation with the HPC bacteria. Fecal coliforms and *E. coli* were strongly correlated generally with the river chemistry indicators, and total coliform bacteria were significantly correlated with road disturbance, dissolved O2, and FC. In analyzing sites by eco-region, the article discusses that the Willamette Valley presented inconsistent indicator patterns.

Critique

This article has an important focus in regard to human health by testing for the presence of harmful microbial bacteria via biological, chemical, and physical habitat indicators. As previously stated, these indicators are used to assess the quality of water and therefore any risks of bacterial exposure to humans. The article was published fairly recently; therefore the results and information discussed most likely hold true for the current status of Oregon water systems.

While the authors provide some basic explanations, this article is best comprehended by a reader with a previous knowledge of water science and microbial bacteria. While the text presents a good foundation for the experiment, the conclusion is somewhat weak in terms of presenting solid, specific results. The attempts to distinguish highly correlated indicators between eco-regions were not successful, nor did a statistical pattern emerge, which was an initial goal. Hence, this article is very useful in attaining knowledge of harmful microbial bacteria, as well as the public health indicators that are used to detect them. It lacks however, in presenting specific information/results about the different eco-regions within the state.

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