

An Assessment of Volunteer Data for Anchorage Streams

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Biographical Sketches of Authors

Shayla Swedlund graduated from the Masters of Science in Environmental Science program at Alaska Pacific University in Anchorage, AK in May 2004. During the summer of 2003, she served as the Quality Assurance/Quality Control intern for the Anchorage Waterways Council. At the AWC she conducted parallel sampling with volunteer monitors to assess the quality control objectives outlined in the Quality Control Plan and continued her thesis research assessing the nutrient and bacteria data obtained by the program.

Richard Myers is Professor and Chair of the Environmental Science Department at Alaska Pacific University. During the 80s and early 90s, his research dealt with air quality and he completed a number of studies on topics such as wood burning impacts using receptor models, indoor air pollution and sick building syndrome. During the last decade most of his work has focused on water quality, primarily working with citizen monitoring groups on the water quality of Anchorage streams. He has worked collaboratively with a number of organizations including USGS, National Park Service, Anchorage Waterways Council, and Municipality of Anchorage.

Abstract

Anchorage Waterways Council's (AWC) volunteer collected data were evaluated to assess the quality of measurements made using methods outlined in AWC's EPA approved Quality Assurance/Quality Control Plan (QA/QCP). Researchers from Alaska Pacific University's Environmental Science Department conducted paired sampling with volunteer stream monitors following the same test protocols as outlined in the QA/QCP. Additional measurements on several parameters were made using EPA approved procedures. Intensive sampling was conducted on coliforms and nutrients. Total and *E.coli* bacteria concentrations were measured using both volunteer Coliscan[®] and EPA accepted Hach m-Coli Blue24[®] membrane filtration methods. Nitrate-nitrogen and ortho-phosphate concentrations were measured using color comparator volunteer methods and a Hach DR890 colorimeter. Several conclusions drawn from this study include:

- 1) There are statistically significant differences in concentrations of nitrate-nitrogen and ortho-phosphate when comparing volunteer and colorimeter methods;
- 2) Volunteer monitors are unable to detect potentially harmful phosphate concentrations due to the subjectivity of the color comparator its high method detection limit;
- 3) There is a statistically significant difference in the concentrations of total coliforms between the volunteer and EPA accepted method, but no significant difference between methods in the counts of *E.coli*;
- 4) Total coliform bacteria concentrations differ by one order of magnitude during a four- hour span under same stream flow conditions.