



Booth No. 38 AN OPEN-ENDED PROGRAM TO ANALYZE DRINKING WATER: PUBLIC SERVICE, EDUCATION, AND RESEARCH OUTREACH USING SPARE ANALYTICAL INSTRUMENT TIME

Sunday, March 17, 2019

08:00 AM - 12:00 PM

📍 Holiday Inn - Portland by the Bay - Casco Bay Hall

Pb contamination in Flint, Michigan has increased public awareness to the importance of clean drinking water. Since this public deceit, NYS requires that all public schools test their drinking water for Pb, and to fix any problems to reduce the long-term risk to public school children. High levels of Pb, Cu, and some other contaminants are usually derived from local plumbing, or scale dissolution and fragmentation, though in some areas aquifers can be sources.

We have been helping people become more aware of Pb, Cu, and Zn contamination in their water by offering free chemical analyses of drinking water samples to those who are not required to have their water tested under the NYS mandate. For this project, we have reached out to people in the Schenectady, NY area, including faculty, students, local businesses, nearby churches, vendors at the local farmers market, and Girls Inc. Participants are told how their contribution would inform them of heavy metals in their drinking water and aid our research on this topic. A standard kit has 3, 60 ml polyethylene sample bottles, an informative brochure, and instructions with space for sample numbers, zip codes, and other information. We collect the bottles, and analyze the samples by ICP-MS. Results are usually distributed by e-mail to sample collectors, and compiled data for Cu, Zn, and Pb are posted to our program web site (scrubbed of personal identifying information).

In addition to Pb, Cu, and Zn, we analyze for other elements including nominally conservative elements Sr, Ba, Rb, and U to distinguish different aquifer sources. Recently, with new analytical capabilities, we have begun analyzing As, Se, Cd, Sb, and Bi as other possible contaminants from aquifers and some lead-free copper pipe soldering alloys.

Results for 513 analyzed samples show ~1% exceed the 5 ppm standard for Zn, ~2% the 1.3 ppm standard for Cu, and ~5% the 0.015 ppm standard for Pb. The highest Pb value was 1.15 ppm Pb, 77 times the EPA limit. Results for the other potentially toxic elements are too few to make firm conclusions, but none analyzed so far exceed set limits. Activated carbon and other filters can be effective at removing heavy metals from drinking water. This project demonstrates how underutilized research equipment can be used to further the public welfare and provide student research opportunities.

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