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Aquatic Environmental Effects of Black Shale in Eastern Kentucky through the Measurement of Chemical and Physical Properties

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Abstract : This study aims to determine if there is a relationship between elevated cancer risks in eastern Kentucky and the environmental effects of black shale. Previous research shows that black shale formations, such as those in eastern Kentucky contain high levels of toxic elements including arsenic and radon compared to average rocks and sediment. Similarly, the population of eastern Kentucky has higher rates of many health conditions, including lung cancer and cardiovascular disease, than surrounding regions. These poor health outcomes are typically explained in relation to social, economic, behavioral, and healthcare factors. The rates of many conditions, however, have not decreased as these factors improve with regional development. Black shale is known to affect environmental conditions such as by increasing radiation levels and heavy metal toxicity. We are mapping the effects of black shale through monitoring radiation, microbes, and chemical standards of water sources. In this presentation, we report on our measuring pH, dissolved oxygen, total dissolved solids, conductivity, temperature, and discharge and comparison with water quality standards from the Kentucky Department for Environmental Protection. The conditions of water sources combined with an environmental survey of the surrounding areas provide a greater understanding of why the people in eastern Kentucky face the current health issues.

Keywords : black shale, eastern Kentucky, environmental impact, water quality
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