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Smoke on the Water: Measuring the Effects of Wildfire Ash on a Fresh Water Stream

Much is known about the effects of wildfire on the land of the forest but there is still more to be learned about the changes that wildfires have on the surface waters within a wildfire zone.

The purpose of this experiment was to measure the changes in pH and dissolved oxygen (DO) of stream water after the addition of replicated wildfire ash. The balances of acidity and alkalinity, as well as usable oxygen are commonly used as indicators of the health of a stream. Results were used to predict what changes in the pH and DO could mean to life within the stream. The hypothesis was based on research suggesting that chemicals contained in wildfire ash would increase the pH and decrease the DO of the water.

Rapid Creek stream water was collected and tree, plant and grass material from around the stream was gathered and burned to ash. The ash was added in 2 different concentrations to samples of stream water. The pH and DO levels of a control specimen of fresh stream water was measured and compared to the levels of the samples of stream water with ash added. The results showed an immediate increase in the pH levels and a decrease in the DO levels for the samples containing ash. The levels continued to drastically change over a 12 and 24 hour period. These results confirmed the hypothesis and led to a conclusion that could predict devastating effects for the life in a stream following a wildfire.