Mercury And Other Toxins Contaminating Remote Grand Canyon Segment Of Colorado River

New findings suggest despite the fact that the Grand Canyon segment of the Colorado River is one of the most untouched ecosystems in the United States; it is still contaminated with toxic chemicals such as mercury.

A recent study led by the U.S. Geological Survey discovered the concentrations of mercury and selenium in Colorado River food webs of the Grand Canyon National Park generally exceeded the exceeded risk thresholds for fish and wildlife. These findings mean local food eaten by humans and animals alike could have harmful effects.

"Managing exposure risks in the Grand Canyon will be a challenge, because sources and transport mechanisms of mercury and selenium extend far beyond Grand Canyon boundaries," said David Walters, USGS research ecologist and lead author of the study.

To make their findings, the researchers looked at food webs at six sites along nearly 250 miles of the Colorado River downstream from Glen Canyon Dam in the summer of 2008. The results revealed mercury and selenium concentrations in minnows and invertebrates exceeded dietary fish and wildlife toxicity thresholds. The researchers noted the number of these samples were relatively low, and concentrations in highly-fished rainbow trout proved to be below EPA thresholds for consumption.

"We also found some surprising patterns of mercury in rainbow trout in the Grand Canyon. Biomagnification usually leads to large fish having higher concentrations of mercury than small fish. But we found the opposite pattern, where small, [three]-inch rainbow trout in the Grand Canyon had higher concentrations than the larger rainbow trout that anglers target. This inverted pattern likely has something to do with the novel food web structure that has developed in Grand Canyon," said Ted Kennedy, USGS researcher and co-author of the study.

Researchers believe the sources of most toxic mercury contamination found in remote ecosystems in the U.S. are airborne transport and deposition, often coming from outside of the country. Long-range downstream transport from upstream sources can also introduce contaminants such as mercury into river food webs. Selenium-rich soil resulting from irrigation in the upper Colorado River basin is believed to have made its way down to the Colorado River in the Grand Canyon.

Exposure to high levels of selenium and mercury has been linked to lower growth and reproductive rates in fish as well as potential health risks in humans.

The findings were published in a recent edition of the journal Environmental Toxicology and Chemistry.