

Analytical Research Focus

ISSUE 1



Analytical Research Technologies

1. Trace Mercury Measurements for Ground/River Using CVAFS
2. Mercury Measurements for Different Matrix
3. Sorbent Trap Development for Mercury Monitoring: A Potential Alternative to OHM/CMM
4. Trace Elements Determination for Different Matrix Using Different Methodology (ICP-ES/CVAFS)

ICSET Analytical Research Laboratory

The ICSET (Institute for Combustion Science and Environmental Technology) analytical laboratory, originally dedicated to serving the needs of ICSET's combustion and emissions laboratories. Since 1993, ICSET has been expanding its capabilities to meet the needs of growing research fields. ICSET uses ASTM/EPA methods combined with the latest instrumentation. In order to provide the best analytical data, ICSET analytical laboratory applies a strict QA/QC program to guarantee the accuracy and quality of your data.

Trace Mercury Measurements for Ground/River Water Using CVAFS

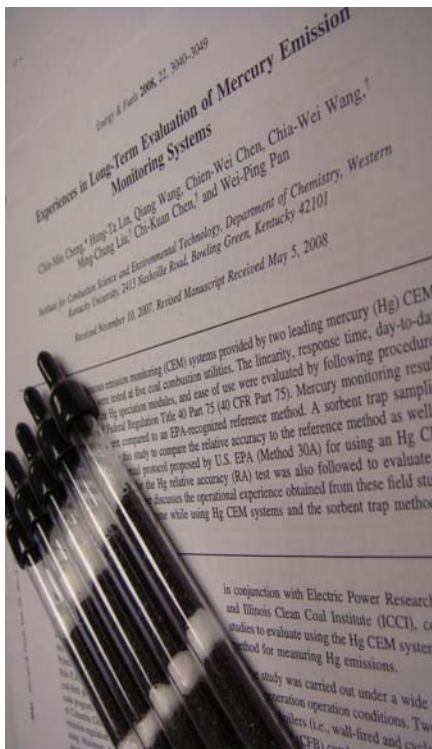
Abstract

Mercury is a toxic metal that poses risks to human health and to the environment. An understanding of the fate and transport of mercury is essential in addressing the mercury problem in the environment.

In this work, water samples were collected from 13 locations comprising both the upstream and downstream areas of the Green River watershed from January 2004 – July 2004 and tested for the presence of mercury in ppt (part per trillion) levels using CVAFS (Cold Vapor Atomic Fluorescence Spectroscopy). The amount of rainfall during this time period and the location of the sample sites in relation to coal-burning power plants were taken into consideration and were used in an attempt to identify if a correlation exists between mercury concentration and the aforementioned factors.

Results

Figure 1 and 2 demonstrates the detected mercury levels at the upstream and downstream of the Green River Watershed during the investigation period. Figure 3 shows the average precipitation versus the average and total mercury concentration for the stated time period.



Conclusion

1. From January 2004-July 2004, the total average mercury concentrations of the upstream and downstream portion of the Green River are 3.30 and 3.14 ppt, respectively.
2. The results showed that rainfall is inversely related to the mercury levels of the water of the Green River.
3. In this study, there is no proof established that the proximity of the sample sites to the locations of coal-burning power plants may have a significant impact on the mercury distribution.

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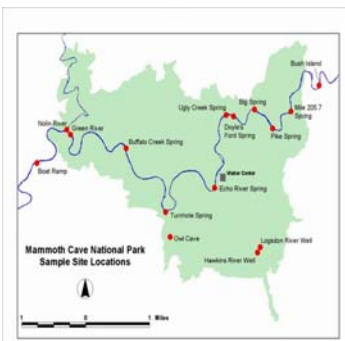
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Sample ID	Sample Location	Primary Land - Use
GRGR	Green River	A,O,U,P
PSPS	Pike Spring	A,P
HRTH	Hawkins River	A,U,P
OCTH	Owl Creek / Turnhole Spring	A,O,U,P
LRTH	Logsdon River	A,U,P
DFDF	Doyle's Ford Spring	P,O,A
NRNR	Nolin River	A,O,U,P
MSMS	Mile 205.7 Spring	P
BIGR	Bush Island	
BSBS	Big Spring	P,A
BSBC	Buffalo Creek Spring	P
ERES	Echo River / Echo Spring	A,O,U,P
UCUC	Ugly Creek Spring	P,O,A
MCBR	Boat Ramp	

A - Agriculture, O - Oil and Gas, U - Urban Development, P - Pasture

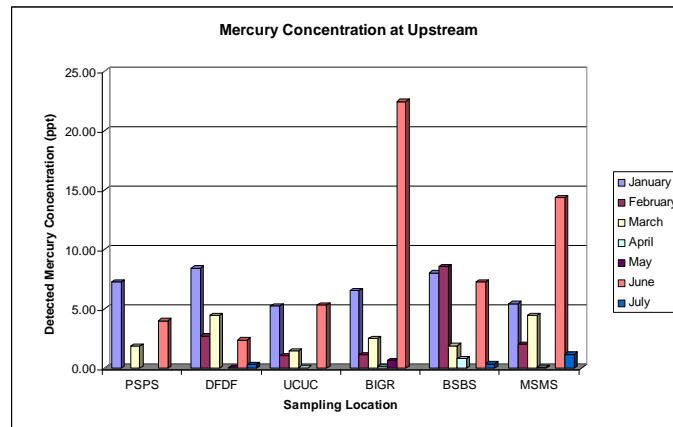


Figure 1 Mercury Concentrations in the Upstream Area

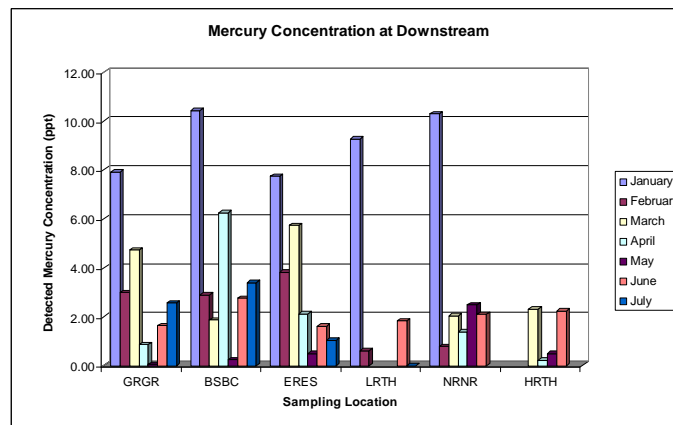


Figure 2 Mercury Concentrations in the Downstream Area

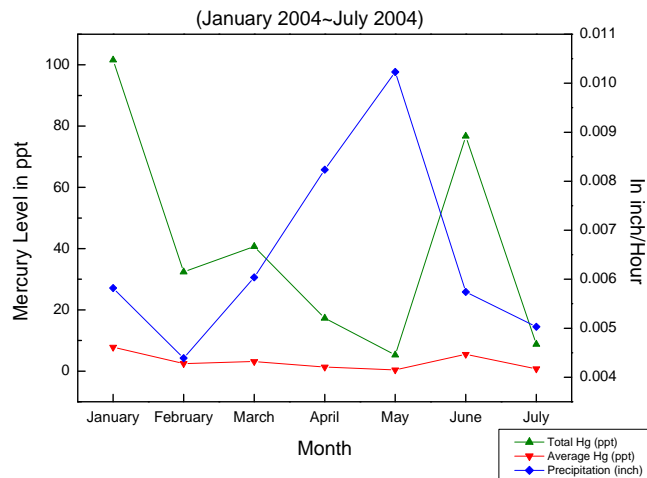


Figure 3 Average Precipitation versus Mercury Concentration