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Post-Katrina: Lead in disturbed soil may pose heightened health risk

Unsafe levels of lead have been found in soil and sediments left behind in New Orleans following Hurricane Katrina and could pose a heightened health threat to returning residents, particularly children, according to a new study published in the American Chemical Society's journal *Environmental Science & Technology*. In some soil samples collected from the area, lead levels were as much as two-thirds higher than what the U.S. Environmental Protection Agency considers safe, according to researchers at Texas Tech University.

High concentrations of lead in the city's soil have previously been reported by others, but lead generally remains embedded in the soil and does not easily come in contact with people unless disturbed, says study leader Steven M. Presley, Ph.D., an environmental toxicologist at Texas Tech in Lubbock. He says that severe flooding may have loosened large amounts of embedded lead and caused it to be deposited on soil surfaces, where exposure to lead particles is more likely, either through skin contact or the inhalation of aerosolized particles. Lead exposure is a particular health concern among children because it can impair the nervous system and cause developmental problems.

Although lead is the biggest health concern, the scientists also found concentrations of aldrin (an insecticide), arsenic, and seven semivolatile organic compounds that exceeded EPA Region VI safe levels and are on EPA's list of known or suspected human carcinogens. In all, the researchers analyzed the sediment and soil samples for 26 metals and more than 90 semi-volatile compounds.

In addition to sediment and soil samples, the researchers also tested water and animal tissues following the flood. Other contaminants found among samples include high levels of iron, several banned pesticides and pathogenic bacteria, but the researchers say that concentrations of most of these contaminants were unlikely to pose an immediate human health threat. The peer-reviewed study, which represents one of the most detailed environmental sampling efforts to date following the flooding caused by Katrina, will appear in the Jan. 15 issue of *ES&T*.

"The purpose of this study is to gather more extensive samples and establish baseline data upon which to evaluate the long-term environmental impact of the storm," says Presley. "It may take years before we really know the full extent of the human health risks and wildlife impact from the Katrina contaminants, but this is an important step."

The researcher cautions that this study alone won't answer the much debated question of whether it is safe to return to the area. Nonetheless, says Presley, people should be made aware of the contaminants that are present and take appropriate cleanup measures to minimize the potential health risks.

For the current study, the research team obtained sediment, soil, water and animal tissue samples over a three-day period (Sept. 16-18) from across a broad cross-section of the city 18 days after the hurricane struck and after most of the water had been pumped from the city. The sampling included 14 different sites in the New Orleans area and focused mainly on the sediment and soil.

Floodwater samples taken at some sites showed extremely high levels of bacteria, particularly *Aeromonas hydrophila*, a little known human pathogen that can cause diarrhea and wound infections. This is the first time that *Aeromonas* has been detected in the Katrina floodwaters, Presley says.

Animal tissues sampled, including dead snakes and an alligator, also contained multiple metals and pesticides, but these levels were generally within an expected range and not likely to be caused by the hurricane, the researchers say. Of the 47 mosquito specimens collected in the study area, all tested negative for West Nile Virus and St. Louis Encephalitis, says Presley. But he cautions that virus-transmitting mosquito populations might increase in the spring and summer.

The researchers are planning to expand their sampling study to include additional cross-sections of the city, Presley says. The Institute of Environmental and Human Health at Texas Tech University and the Patent & Trademark Institute of America provided funding for this study.

The American Chemical Society is a nonprofit organization, chartered by the U.S. Congress, with a multidisciplinary membership of more than 158,000 chemists and chemical engineers. It publishes numerous scientific journals and databases, convenes major research conferences and provides educational, science policy and career programs in chemistry. Its main offices are in Washington, D.C., and Columbus, Ohio.

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The online version of the research paper cited above was initially published Dec. 14 on the journal's Web site. Journalists can arrange access to this site by sending an e-mail to newsroom@acs.org or calling the contact person for this release.