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New research reveals Hurricane Katrina's impact on ecological and human health

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Scientists studying the environmental impact of Hurricane Katrina on the Gulf Coast of Louisiana and the city of New Orleans have revealed the ecological impact and human health risks from exposure to chemical contaminants. The findings, published in a special issue of Environmental Toxicology and Chemistry, demonstrate how Hurricane Katrina caused significant ecological damage by altering coastal chemistry and habitat.

The research reveals how chemical concentrations across coastal areas varied, but within New Orleans elevated concentrations of lead, arsenic and other chemicals were found, particularly in the most disadvantaged areas of the city following Hurricane Katrina. The team also discovered how airborne contaminants known to pose health risks, were released through demolition projects during the city-wide cleanup operation.

"While evidence suggests that hurricanes may increase in intensity, resulting in even greater economic damage in the future, social and cultural factors are also important aspects to consider for the future impact of hurricanes," said Dr. Bill Benson of the United States Environmental Protection Agency (USEPA). "It is important that higher priority is given to understanding social factors and demographic patterns pertaining to continued development along our nation's coastline."

Hurricane Katrina, which hit New Orleans in August 2005, remains the costliest and deadliest hurricane ever to hit the United States. When the category five hurricane hit land, the resulting surge extended six miles inland, breaching the levees of New Orleans and causing flooding to 80percent of the city to depths of six meters.

In human terms Katrina resulted in 1,800 confirmed fatalities spread over six states with at least 700 people confirmed missing and an additional one million people displaced. Katrina-related damage is estimated to exceed $84 billion, making it the most expensive natural disaster in US history. Yet it is the indirect environmental impact that continues to pose a risk to the population of New Orleans.

To discover the impact of chemical contamination Dr. George Cobb from Texas Tech University led a team to study 128 sampling sites from across the city, combining their findings with data sets generated by Dr. Burton Suedel and co-workers with the U.S. Army Corps of Engineers. Maps were then compiled from the resulting data to reveal chemical distribution across the city.

Elevated concentrations of arsenic and lead were demonstrated to exist throughout New Orleans with the highest concentrations observed in soils from the poorer sections of the city. The team also discovered that lead concentrations exceed the regulatory threshold for safety, with the highest concentrations found in the oldest parts of the city. Lead in soil poses a significant risk to residents who returned to their homes following the evacuation, especially children.

While the team's findings indicated that levels of lead frequently exceed regulatory thresholds, further research showed that many of the contaminants were present in high concentrations before the storm season and that lead may have posed a significant risk to New Orleans residents for years before Hurricane Katrina.

The results also revealed elevated concentrations of arsenic in surface soils and flood sediments across New Orleans, caused by sediment deposition or from flooded building materials.

"Our evaluation of contaminants in New Orleans was critical in determining whether storm surges and resultant flooding altered chemical concentrations or distribution," concluded Cobb. "Our results show how long-term human health consequences in New Orleans are difficult to attribute to chemical deposition or redistribution by Hurricanes Katrina and Rita, yet reveal how chemical contamination is a historical problem for old cites in the U.S. Our results and the data from coastal ecosystems reveal the value of long-term monitoring programs to establish baseline concentrations and distributions of contaminants in the environment."