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New Orleans Area Environmental Quality Test Results

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Particulate Pollution

Health Effects of Particulate Matter

Particulate matter refers to particles of dust, soot or sediment in the air. If the particulate matter in the air is small, it can penetrate deep into the lungs. Fine particulate matter (PM10 or PM2.5) has been linked in hundreds of studies to a long list of serious human health effects, including reduced lung function, coughing, wheezing, missed school and work days due to respiratory symptoms, increased use of asthma medications, cardiac arrhythmias, strokes, emergency room visits, hospital admissions, lung cancer and premature death. Infants and children are especially sensitive to particulate matter. In addition, people with asthma, the elderly and people with pre-existing heart or lung disease are most at risk from inhaling this widespread pollution.

The current air quality standard for PM 10 is 150 micrograms per cubic meter (ug/m3) averaged over a 24-hour period. For PM 2.5 the standard is 65 ug/m3. Based upon its recent review of the scientific literature, the EPA has determined that this standard is not adequately protective of human health, and the agency is poised to propose a more stringent standard that will likely be in the range of 25 to 35 ug/m3 over 24 hours. Although we did not monitor for 24 hours in any one location, we are comparing our results to these numbers as a point of reference.

The particulate matter in New Orleans may not be the same as particulate matter in other parts of the country. Airborne particles of dried sediment left behind from the flooding could cause additional health concerns. Testing by the EPA and by independent groups has found numerous contaminants in the sediment (see www.labucketbrigade.org). Levels of arsenic and petroleum chemicals were particularly high in many areas of Orleans and St. Bernard parishes. In addition, cancer-causing PAHs (polyaromatic hydrocarbons) were found at levels that exceeded EPA cleanup guidelines for residential areas. So it is unlikely that the EPA standards for regular particulate matter are sufficient to protect against the particles in the air in the New Orleans area.

How We Sampled for Particulate Pollution

NRDC monitored the air at street level in four previously-flooded areas of the city of New Orleans and in two areas in St. Bernard Parish. Our monitoring in New Orleans included the

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Lower Ninth Ward, Mid-City, Uptown and Lakeview. In St. Bernard Parish we monitored in Meraux and Chalmette. We tested over a period of three days from a vehicle driving slowly through the neighborhoods. On our first sampling trip, we used a personal DataRAM model pDR-1200 with a cyclone and pump attachment set to 1 liter per minute to take direct readings of PM 10. We also collected the particulate matter on a Teflon filter for more detailed analysis (results pending). On our second sampling trip we used a DataRAM 4000 with internal pump. In each case, the instrument was set to report readings every 60 seconds, and was attached to tubing drawing air from outside the car. We noted the surrounding road and neighborhood conditions during the sampling period.

To analyze the data, we calculated an overall average of the levels of fine particulate matte during the monitoring period. We also calculated an average of the levels we monitored during periods of time when vehicles were passing or driving ahead, thereby raising dust or sediment from the road. Finally, we noted the minimum and maximum levels monitored and graphed the results for the entire monitoring period in each neighborhood.

Results of our Sampling for Particulate Matter

We found that the air quality in most of the flooded areas of the city ranged from fair to very good during the periods of time we sampled -- with average fine particulate matter levels in October ranging from a low of 7 ug/m3 in Mid-City to a high of 54 ug/m3 in Uptown. In November, average particulate matter levels ranged from a low of 24 µg/m3 in Metairie to a high of 60 µg/m3 in Gentilly. However, we identified areas where the levels of particulate matter were significantly higher. In October, peak measurements ranged from 70 ug/m3 in Gentilly to 688 ug/m3 in Lakeview. In November, peak measurements ranged from 41 µg/m3 in Marigny to 128 µg/m3 in Mid-City. Areas that had potential air quality problems included side streets in Chalmette and Meraux where contaminated sediment was becoming airborne due to vehicle traffic, and streets where building work was going on, especially in Lakeview, Gentilly, Mid-City and Uptown. (For complete particulate matter testing results by neighborhood, click here.)

Uncertainties

Particulate levels can be heavily affected by weather conditions. Conditions were mild during our sampling, with little to no breeze. Levels may be significantly higher during windy weather, or during humid still weather. Alternatively, levels can be near zero during wet weather.

The monitoring equipment used to measure particulate matter was limited in that it cannot detect larger particulates (greater than 10 microns in diameter) or dust. We suspect that large particulate levels may have been significantly elevated in areas where cleanup and construction activities were taking place. Health effects from larger particulate matter can include upper airway irritation, cough, sinus problems and eye irritation. We recommend that extra precaution be taken to wear protective gear in or near cleanup and construction activity.

We should also note that the sampling durations were very brief and therefore only represent snapshots in time. The data cannot be interpreted to mean that any specific locations consistently have very low or high particle levels. Rather, the data shows that particle levels tend to be quite high near heavy cleanup and construction activities or in areas where there is still sediment on the streets that is being disturbed by traffic.

How Our Data Compare to Earlier PM Monitoring by the EPA

The EPA measured PM levels from September 11th to 19th using a similar monitor (Data

RAM) as the NRDC team. Levels measured by the EPA were generally higher than those that we found, perhaps due to differing weather conditions. Specifics on how the EPA performed monitoring or for how long are not clear; however, averages are compared to our findings below.

Averages from	EPA September Data (ug/m3)	NRDC October Data (ug/m3)	NRDC November Data (ug/m3)
Chalmette Area	67	25	--
Uptown Area	33	54	41
Mid-City Area	33	7	35

How Our Data Compare to Historical Data

It is difficult to compare post-flooding PM data to historical PM data, because many usual sources of PM such as traffic and industry are no longer active. Additionally, historical 24-hour averages for PM are no longer available online (according to EPA and Louisiana Department of Environmental Quality websites). Annual average PM 10 levels at two New Orleans monitors (located at the Water Purification Plant on Carrollton Avenue and Jefferson Highway, and on the corner of Florida Avenue and Orleans Avenue) in 2004 ranged from 19 to 22 ug/m3.

Recommendations

Based on our sampling results, people working in the dusty parts of the city, especially where there is sediment on the streets or where building or demolition work is going on nearby, and anyone engaged in cleanup activities or demolition, should wear respiratory protection -- specifically, an N95 respirator.

Extra precaution should be taken to minimize exposure by wearing protective gear during windy weather.

Because our instrument was set to measure only fine particulate matter, these results do not include coarse particles in the air. Coarse particles can arise from sediment, building materials or dust. Coarse particulate matter can be highly irritating to the eyes, nose, sinuses and throat. Health symptoms from exposure to these larger particles may include red, irritated eyes, a runny nose, congestion and cough. Therefore, there are numerous reasons to take respiratory precautions upon entering previously flooded neighborhoods in New Orleans and nearby areas.

Particulate Matter Results by Neighborhood

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