

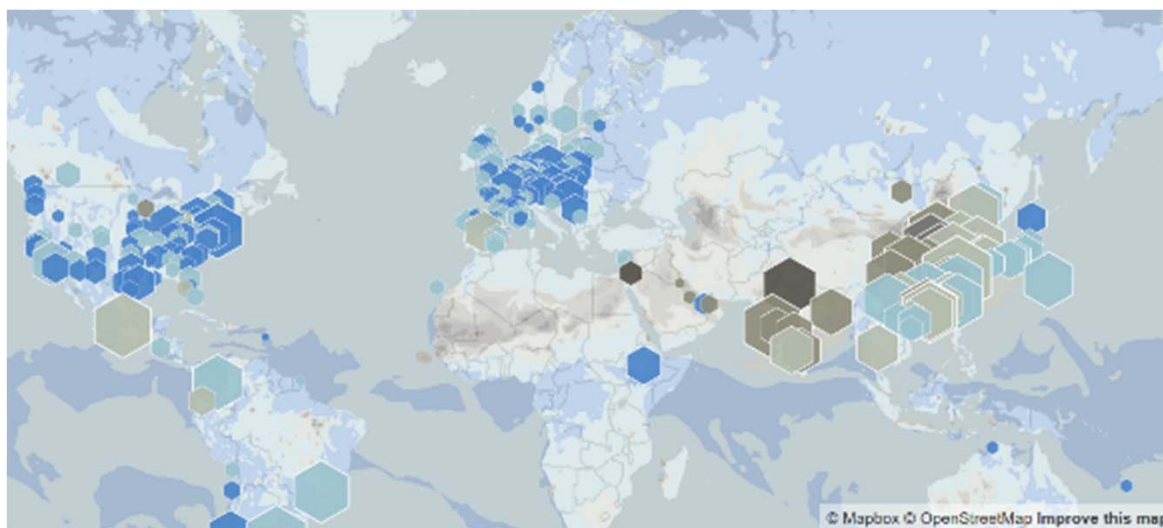


**RUTGERS**  
BIOMEDICAL AND  
HEALTH SCIENCES

*Comments on:*  
**Air Pollution and Our Cities**  
with focus on Newark/Elizabeth and surrounding areas

Panos G. Georgopoulos  
Rutgers School of Public Health  
& EOHSI

**Public Health and Our Ports**  
**October 26, 2108**  
**Newark, NJ**

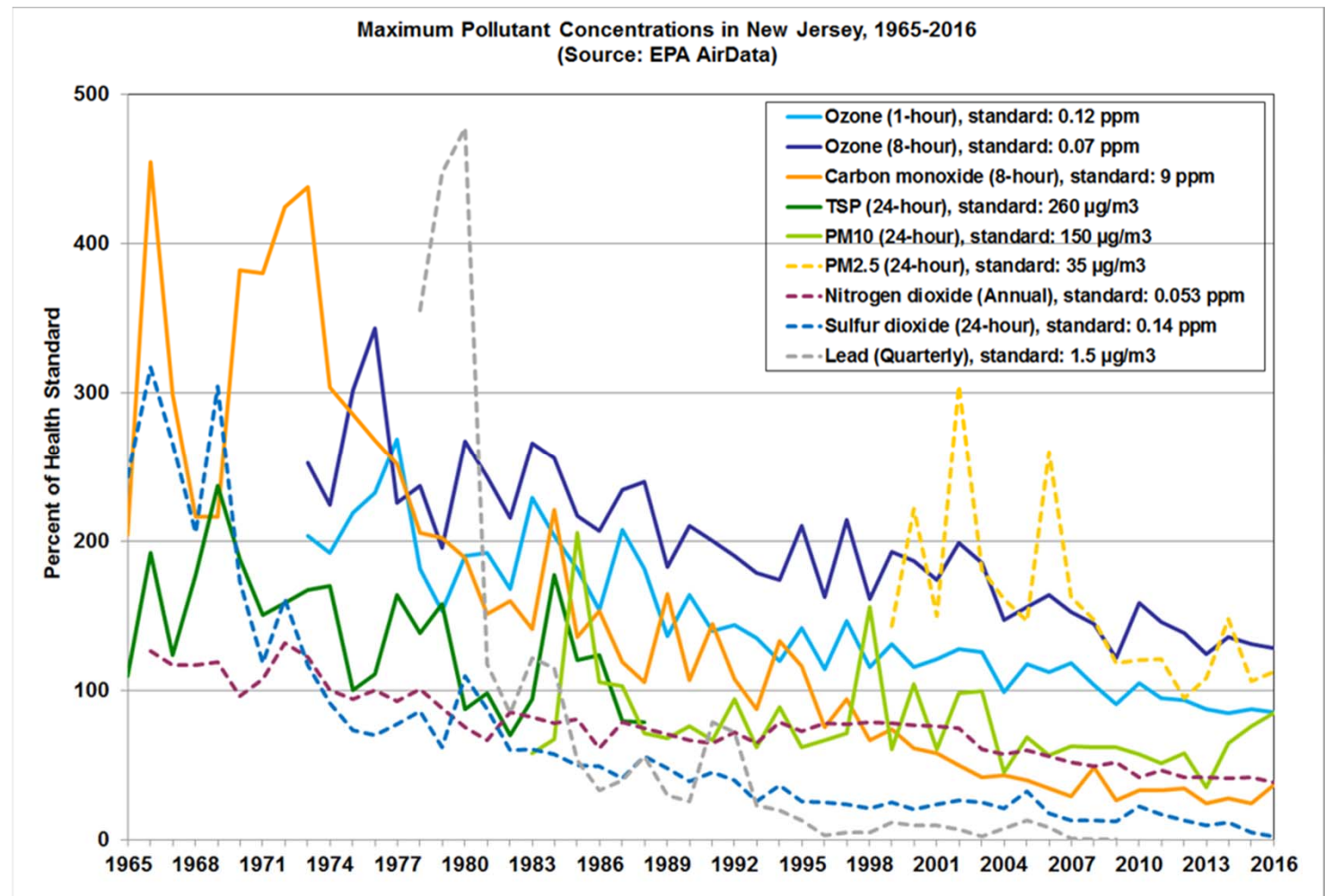


World Air Pollution Map  
by Plume Labs  
2018-10-25, 11 AM EST



First, the good news: air pollution in New Jersey has been steadily improving over the years

**Trends of Criteria Pollutant levels in New Jersey**

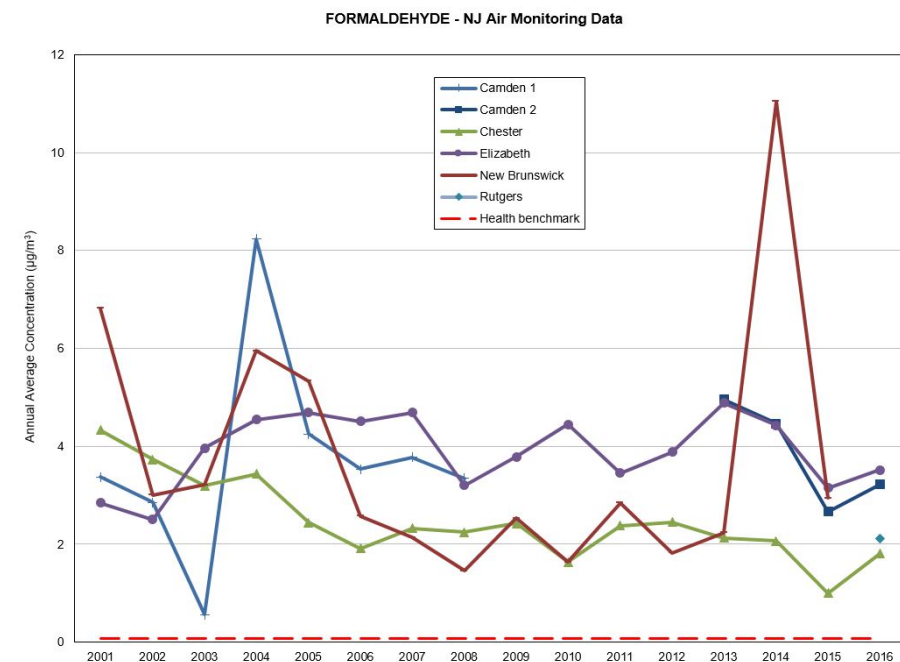
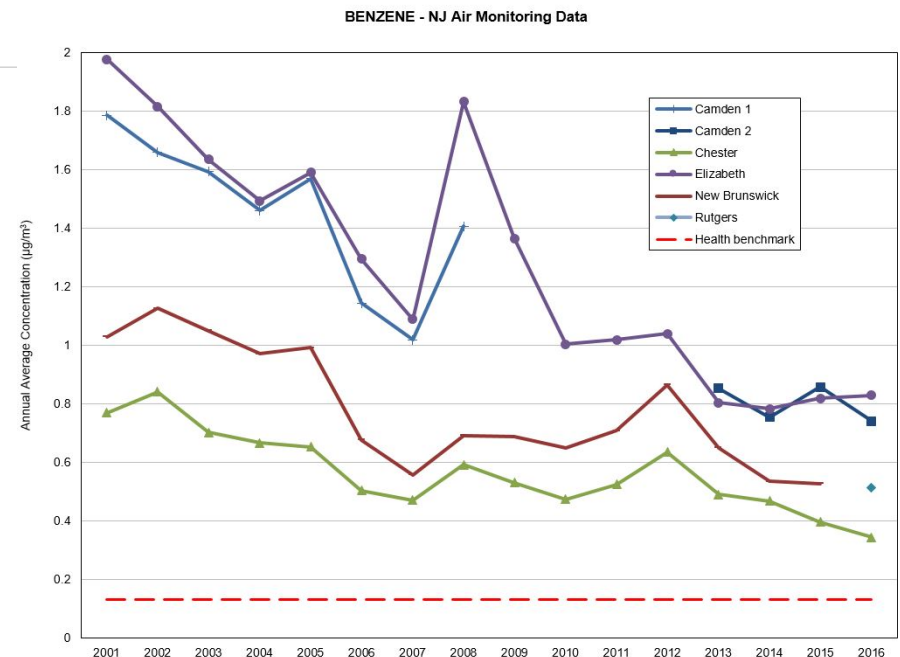


However, levels of air toxics (HAPs) remain **among the highest** in the US

2014 Percentile Rank for Airborne Concentrations of			
COUNTY	DEP	Benzene	Formaldehyde
Atlantic	83.4	85.3	41.2
Bergen	99.1	99.3	56.2
Burlington	96	96.9	54.3
Camden	98	98.1	55.9
Cape May	77.6	78.3	28.4
Cumberland	82.7	85.9	45.9
<b>Essex</b>	<b>98.9</b>	<b>99.2</b>	<b>57.4</b>
Gloucester	94.4	96.1	51
<b>Hudson</b>	<b>99.9</b>	<b>99.6</b>	<b>66.8</b>
Hunterdon	91.5	96.3	45
Mercer	97.5	97.8	52.2
Middlesex	98.5	98.1	54.7
Monmouth	97.2	95.1	45.5
Morris	93.6	95	45.1
Ocean	94	93	42.5
Passaic	98.4	98.8	52.9
Salem	92.1	91.5	47
Somerset	96.5	97.2	50.2
Sussex	72.6	91.4	38
<b>Union</b>	<b>99.1</b>	<b>98.8</b>	<b>57.3</b>
Warren	88.1	95.9	43.7

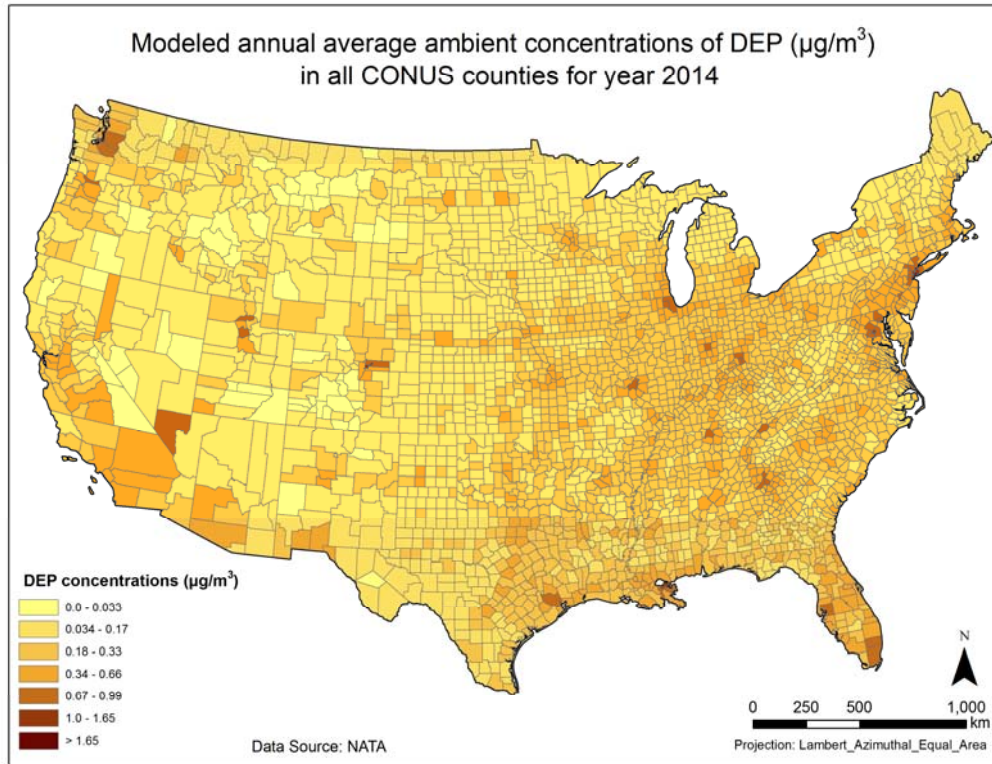
HAPs: Hazardous Air Pollutants; DEP: Diesel Exhaust Particles  
Data Sources: USEPA (NATA, 2018 release) and NJDEP

Rutgers School of Public Health  
& Environmental and Occupational Health Sciences Institute



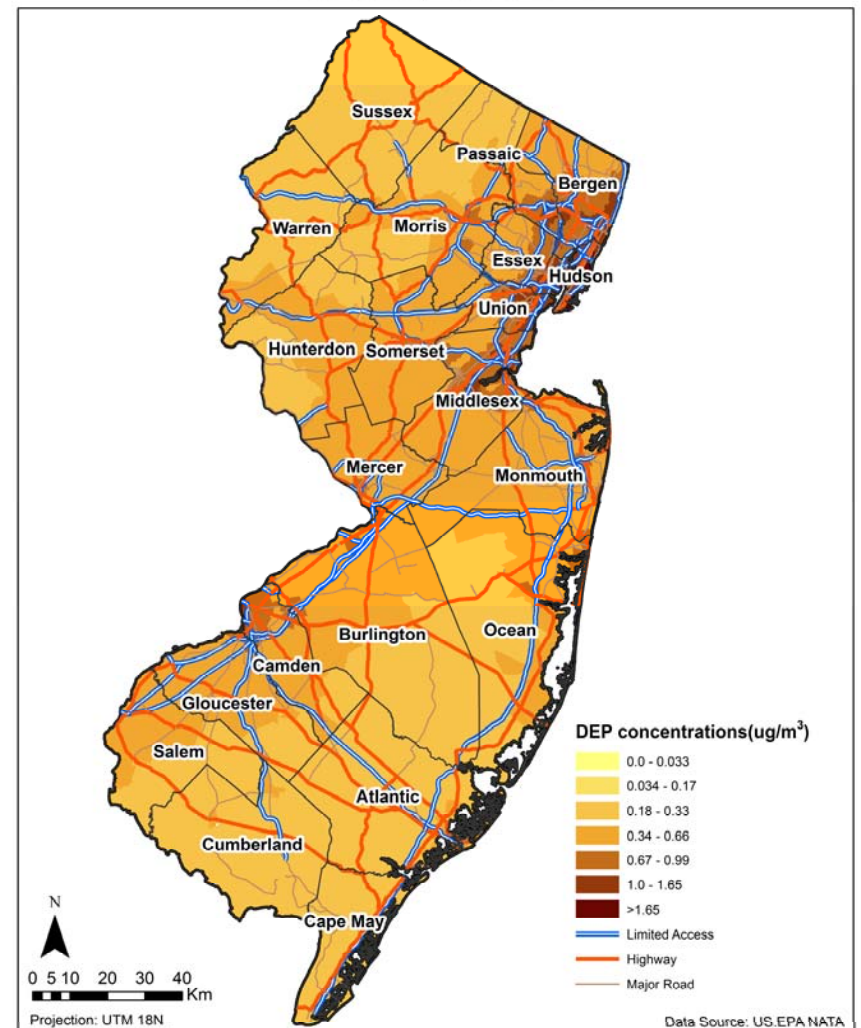
# New Jersey and in particular the Newark/Elizabeth area have some of the highest Diesel Exhaust Particle (DEP) air levels in the US

Modeled annual average ambient concentrations of DEP ( $\mu\text{g}/\text{m}^3$ )  
in New Jersey for year 2014



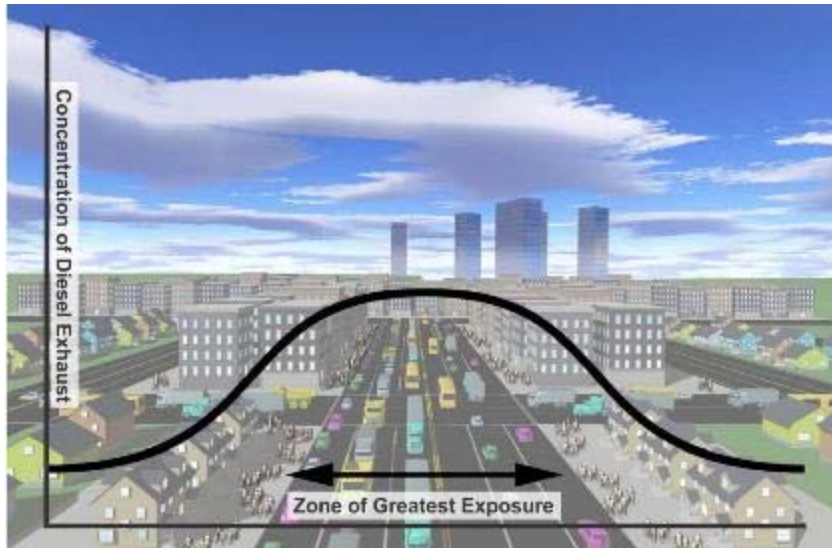
Note: map colors are based on multiples of the “California cancer health benchmark” for DEP,  $0.0033\mu\text{g}/\text{m}^3$ ; so 0.34-0.66  $\mu\text{g}/\text{m}^3$  is 100-200 times, 0.67-0.99 is 200-300 times, and 1.0-1.65 is 300-500 times the benchmark

Rutgers School of Public Health  
& Environmental and Occupational Health Sciences Institute



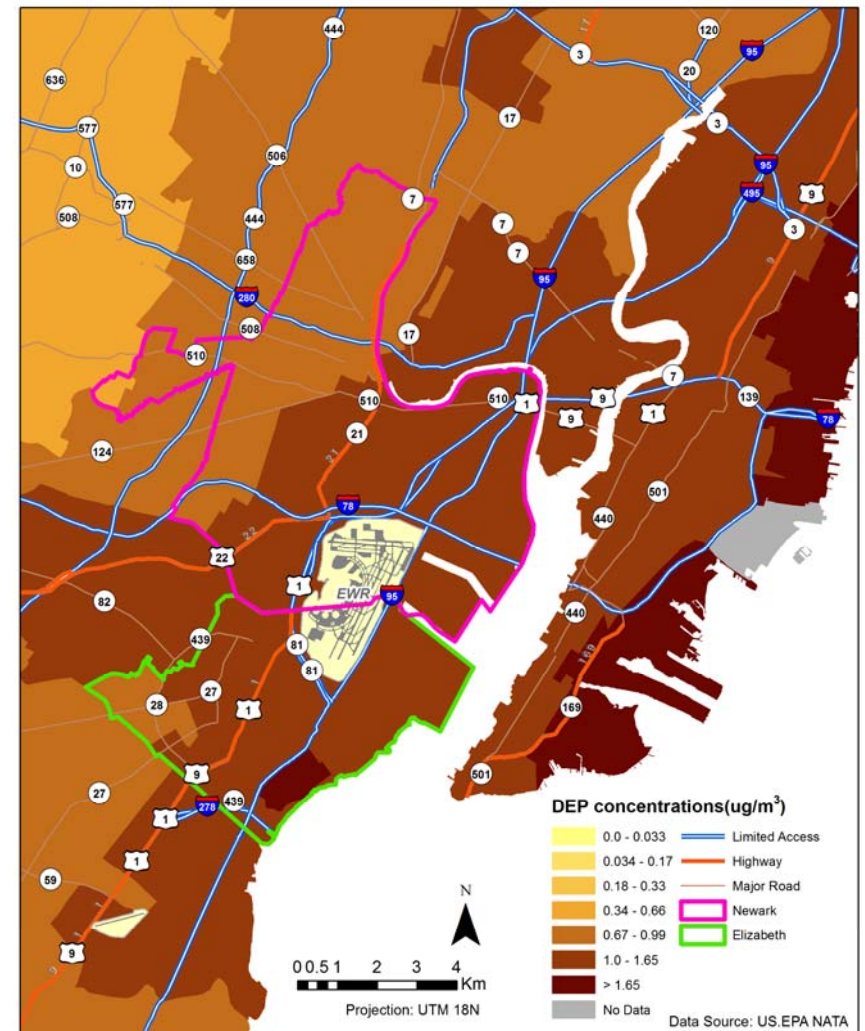


# Annual average concentrations across census tracts **do not** capture the high levels caused by **proximity** of urban populations to sources

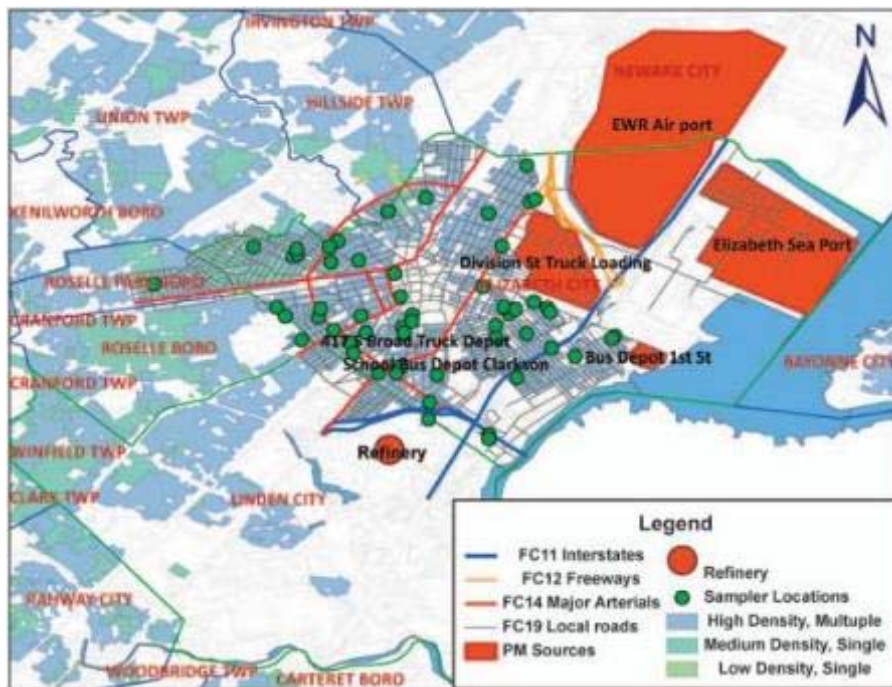


Rutgers School of Public Health  
& Environmental and Occupational Health Sciences Institute

Modeled annual average ambient concentrations of DEP ( $\mu\text{g}/\text{m}^3$ )  
in Newark / Elizabeth and surrounding areas for year 2014

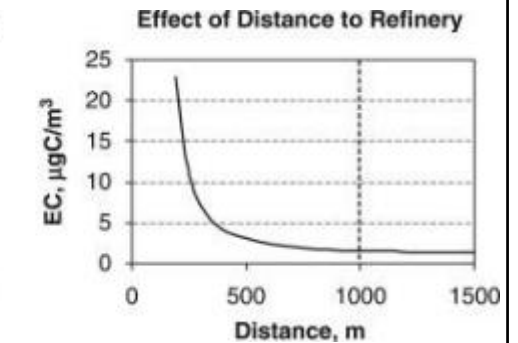
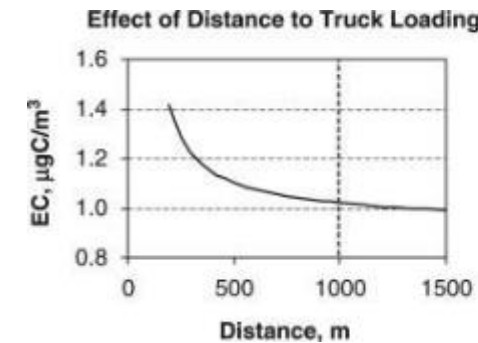
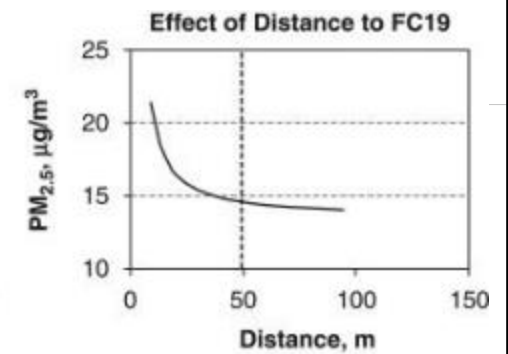
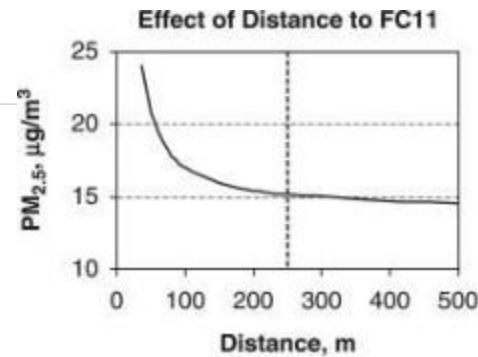


# An EOHSI field study in Elizabeth demonstrated the importance of **proximity** to sources of pollutants



- Study results published in JESEE (2010) 20, 457-468
- FC11: interstate roadways; FC19: local roadways
- EC: elemental carbon (representative of DEP)

Rutgers School of Public Health  
& Environmental and Occupational Health Sciences Institute



Population near major roadways



Population near gas station



~7% of the population of Elizabeth lives within 50m from sources of toxic air pollutants; air concentrations there are 50-500% higher than urban background