Harlem Ecological Summary and Solutions

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Purpose

- People fish as a hobby in the Harlem and Hudson River
- In both the Harlem River and the Hudson River there are toxins that settle down to the bottom of the river. Our mission is to find out what are these toxins.
- Air quality surrounding F.D.A. is the worst in N.Y.C. so hopefully we can raise awareness with our research.

Background on the Hudson River

- About 315 miles long, that begins from the Hoosic River and Mohawk River and then becomes the Hudson River.
- Runs between the states of New York and New Jersey.
- The lower part of the Hudson River is a tidal estuary. It can flow either way.
- Arsenic has been found in the Hudson River. However it was at the bottom.

Background on the Harlem River

- About 8 miles long
- Tidal strait
- Runs between Harlem and South Bronx

Background on Particulate Matter

Particulate matter is solid and liquid particles suspended in air. Most are hazardous. This can contain for instance dust, pollen, soot, smoke, and liquid droplets.

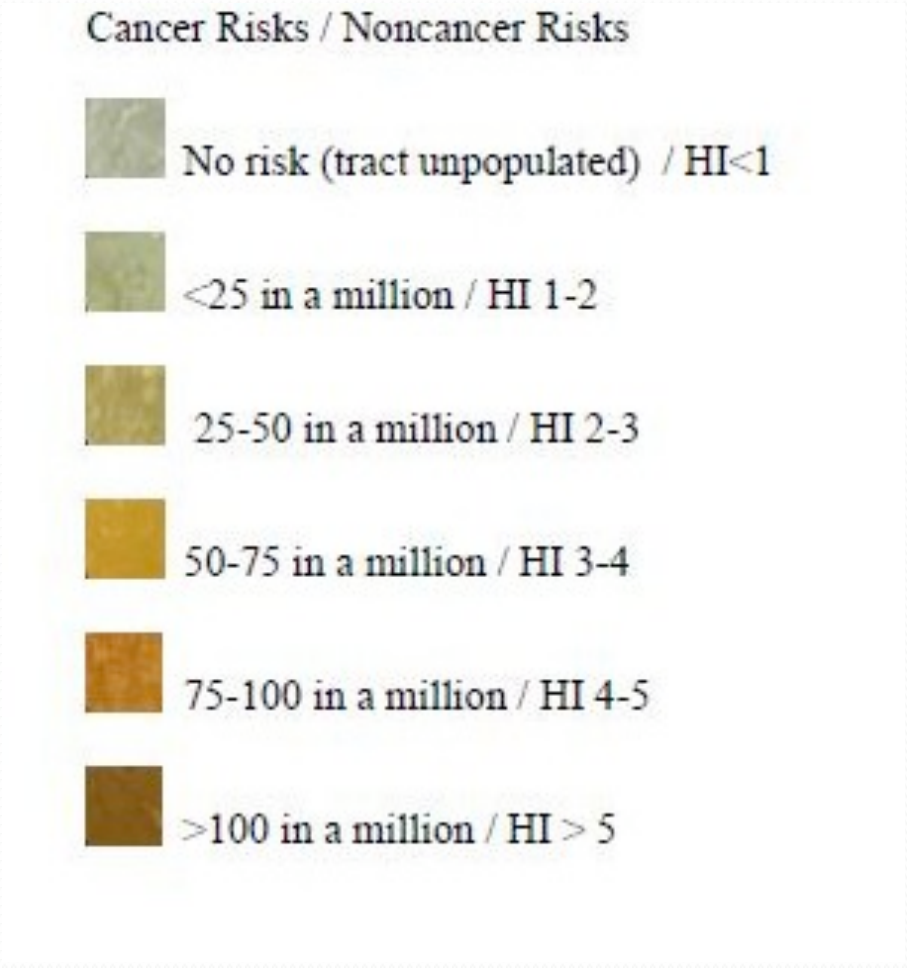
What is in our air?

Name of Chemical	Percentage of Total Pollution in Area	Everyday Uses	Diseases It May Lead To
Benzene	35%	Make plastic, nylon, pesticide	Leukemia, Hodgkin Disease
Naphthalene	12%	Major Ingredient in Moth Balls	Flu, skin discoloration, oliguria
Butadiene	12%	Make rubber	Liver disease
Carbon Tetrachloride	7%	Fire Extinguishers, Lava lamps	Liver, Kidney, and Central Nervous System Malfunctions
Acetaldehyde	5%	Tobacco (CIGARETTES)	Respiratory Malfunction
Arsine	3%		Kidney failure
Chromium	3%	Metal car parts	Liver or Kidney Disease

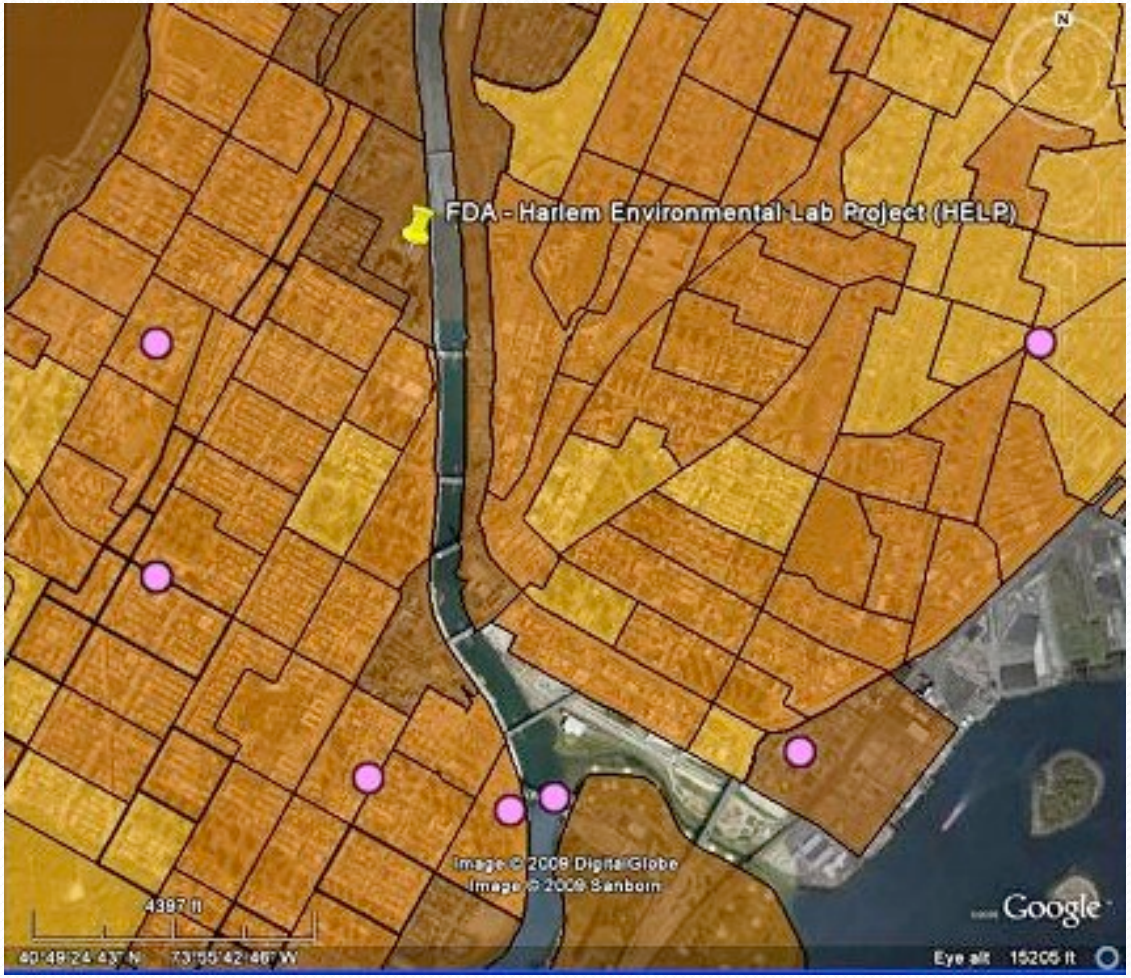
Particulate Matter cont'd

The area in which our school, Frederick Douglass Academy is surrounded by, has an enormous amount of particulate matter. The risk of cancer of the surrounding area of the school within a 5 block radius in any direction is higher than one hundred in a million (EPA 2009).

Air Quality Map key



Air Quality Map



Cancer Risks / Noncancer Risks

- No risk (tract unpopulated) / HI<1
- <25 in a million / HI 1-2
- 25-50 in a million / HI 2-3
- 50-75 in a million / HI 3-4
- 75-100 in a million / HI 4-5
- >100 in a million / HI > 5

ArcGIS

- ArcGIS is a software suite consisting of a collection of geographic information system (GIS) software programs. The main program we will be using is ArcMap which is the main component of ArcGIS. It allows the user to view, edit, analyze, and create geospatial data.

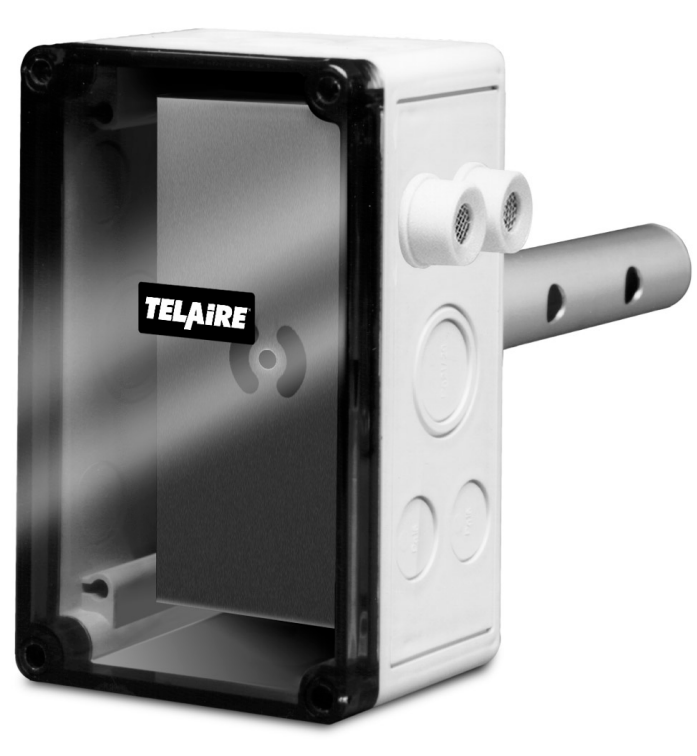
Objectives

- Determine the physical chemical parameters of the Harlem River and compare to the Hudson River
- Determine the effect of air quality on the surrounding community's health.
- Propose realistic improvements.

Materials

Materials	Quantity
A YSI OMS600	1
pH YSI 556	1
Buffer solutions(pH 4, pH 7)	1 bottle each
Computer with Excel	1
Distilled water	1 bottle
Computer installed with Excel	1
PVC pipe	5 meters
PVC glue	1 can
Drill	1
Drill bits	1
Ruler	1
Spray paint	2 cans
Inflatable boat	2

CO2 sensor



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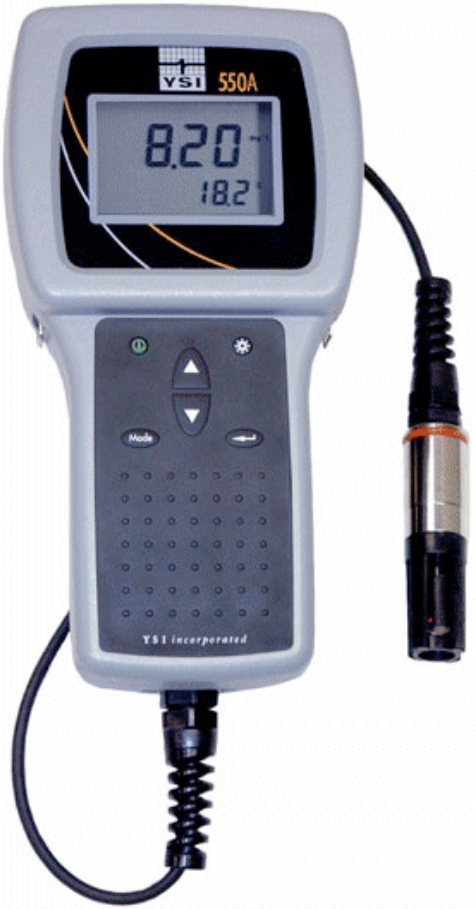

What We have Done So Far

- Taken Oxygen, Temperature, pH, and Salinity, measurements from the Harlem River
- Taken water samples from the Hudson River.
- Worked on a mapping program called ArcGIS

What We've Done So Far cont'd

Solutions to Propose

- Urban Farming
- Vegetation therapy
- Alternative transportation
- Alternative energy
- Water management
- Research

Future Plans

- Take and analyze more measurements from the Hudson River.
- Show the levels of the different parameters on maps generated by Arc GIS
- Add F.D.A. to the E.P.A. monitoring program
- Design pier to the back of F.D.A.

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Thank You for Listening!!!