Exploring Pollution Borne Illness

Defining the Problem

Our team has chosen to work with the epidemiology of pollution borne illness across the country. In recent years, with growing pollution, the rise of these diseases can be tied directly back to certain pollutants present in the environment. By using multiple studies we will be able to create a template that could be used by civil engineers to show which disease are being caused by what pollution and from where. We will then use this template to create models of a few cities around the United States as a proof of concept. We will also work to create a friendly user environment and a heat map for easy interfacing.

Our Plan to Solve this Problem

We have determined that the best way us to solve this problem is by working from the cases of disease backwards to the origin of pollution. This will allow us to see which outbreaks are caused by which areas of pollution. Our given information will be the type of disease, location of the outbreak, wind and terrain of the surrounding area, and origins of all pollutants. Using public data we will be able to fill out all of these which will allow us to determine our dependent variable which is the specific origin of the particulate matter responsible for the outbreak of disease. We will then model the area in question, weather, and pollutant creators. We will then overlay a heat map of the pollution overtime. This will then allow us to effectively look back and see the origin of the pollutants that caused this to occur. We will use an algorithm of our own creation to calculate the movement of particulate matter through the atmosphere. This then shows us the origin of the pollutants that cause outbreaks of disease.

James Mims: head of the computer science department at Academy

1. http://circ.ahajournals.org/content/109/1/71.short (An entry by the American heart Association)
2. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1240667/ (A dissertation by the enviromental health prospective on the correlation between pollution and disease)
3. http://www.atsjournals.org/doi/abs/10.1164/rccm.200701-036OC (A Scholarly Article that correlates car emmisions with disease)
4. http://www.atsjournals.org/doi/abs/10.1164/ajrccm/151.3_Pt_1.669#.Vmd3__krKhc (An article working with the mortality rates in correlation to pollution)
5. http://www.nytimes.com/2013/04/02/world/asia/air-pollution-linked-to-1-2-million-deaths-in-china.html?_r=0
6. http://www.eoearth.org/view/article/150296/
7. http://www.nyc.gov/html/doh/downloads/pdf/eode/eode-air-quality-impact.pdf

8. http://www.eia.gov/environment/emissions/state/analysis/v