Project 4: Plume Modeling

The objective of this project is to get you involved in the process of environmental modeling. This work will combine data that you find on-line with analytic diffusion models that we discuss in class.

Background: For many years the ASARCO smelter in point Ruston released lead and arsenic into the air. As a consequence, much of the south Puget Sound area is heavily contaminated with these metals. GIS data is available on-line that illustrates the distribution of contaminants as a function of geographic position. There is also data, collected by NOAA and others, on the direction and strength of prevailing winds. Your goal is to come up with a model of plume diffusion that explains the existing pattern of ground contamination.

Possible Data sources:

- http://www.tacomaweathercam.com

Things to think about:

- Does a visual inspection of the pattern of ground contaminants reveal anything about the direction of prevailing winds?
- Do you observe any unusual features in the pattern of contaminants? Can you think of any explanation? (e.g. topographical features, etc.)
- Does your model retain validity up the limits of the contaminated area, or does it imply a near-field approximation?
- Do your results have any epidemiological significance, or is that beyond the scope of your analysis?

Due Date: The final report will be due the day of the class final.