

ENVIRONMENTAL JUSTICE

Lakes Environmental Software

ENVIRONMENTAL JUSTICE 2001



Client:

New Jersey

DEPARTMENT OF
ENVIRONMENTAL
PROTECTION

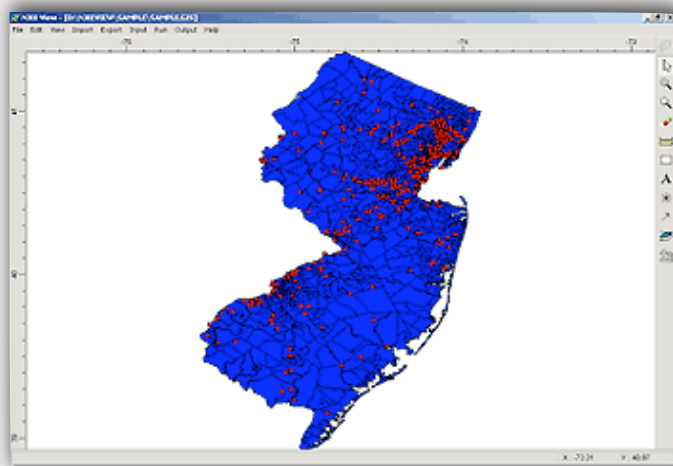


PROJECT

This research work started in the year 2000 and extended until December 17, 2001, the date the U.S. Court of Appeals ruled in favor of the State of New Jersey.

Lakes Environmental Software was hired, on a sole source basis, to develop unique Environmental Justice solutions. The American 1964 Civil Rights Act – Title VI mandates that all federal fund transfers be suspended from States that discriminate against race or ethnic groups. A lawsuit was brought against the State of New Jersey by a minority group arguing that environmental permits was causing disparate impacts.

Lakes Environmental NJEE View displaying large toxic sources

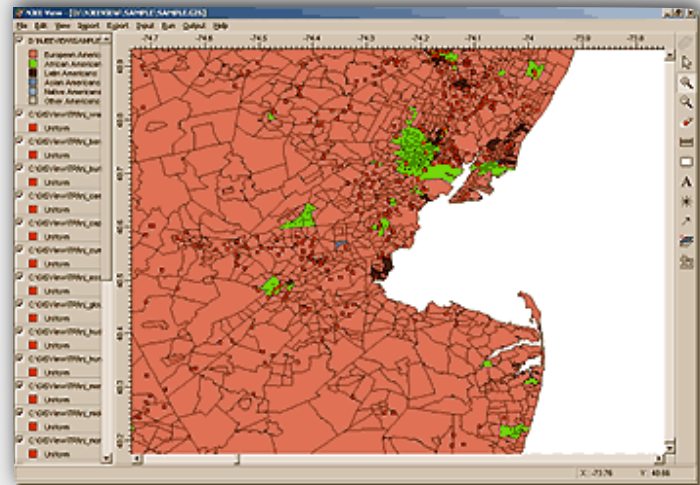


A review on previous research in the field indicated that total Hazardous Air Pollutant (HAP) emissions were compared against population counts, stratified by race. It was evident that researchers were ignoring chemical toxicity from each chemical. This ineffective approach would result in unrealistic comparisons such as one gram of the highly toxic dioxin being evaluated against one ton of the less harmful carbon dioxide.

Lakes Environmental and the New Jersey joint research goals require a system, which can accomplish both the site-specific study and statewide coverage within one framework of analysis. This is due to the fact that many cases will be analyzed in the absence of a complaint and they may appear for consideration at any location in the state at any time. Therefore, for a timely and consistent response to permitting applications the Department must make many of the choices which might, in a complaint driven system, be directed by community concerns. These choices include the geographic boundaries of the analytic subunits and the type and number of stressors to be considered.

To satisfy these goals *Lakes Environmental* constructed a model that evaluates census data and exposure data from various stressors such as air pollutants, and hazardous sites, which are summarized at the census tract level. These data are combined and analyzed so that a statewide race specific ratio is determined. A ratio of greater than 1 indicates the race (sub-population) under consideration may be receiving more than the average effect from the stressors and a ratio of less than one indicates less than the average statewide effect.

Lakes Environmental NJEE View displaying population distribution



Risk assessment was conducted for thousands of sources within 1,937 census tracts. Reviewers at the New Jersey Department of Environmental Quality accepted that we interpolate results from smaller study areas. They understood the magnitude of the problem we were facing and accepted the small inaccuracy in the system. Subsequently to conducting risk assessment in a scale not previously achieved, we had to test the hypothesis that discrimination was occurring statewide. Simplifications over the tests resulted in Equation (1), which describes the mathematical relationship among the variables evaluated for the environmental equity determination.

$$PER_s = \frac{\frac{\sum R_s}{S}}{\frac{\sum R_w}{W}} \quad (1)$$

Where:

PER_s	=	Population Emissions Ratio for sub-population s (ethnicity)
R	=	Risk
s	=	number of people in sub-population in census tract
S	=	number of people in sub-population in state
w	=	number of people in census tract
W	=	number of people in state

One PER_s was determined for each of the 6 race or ethnicity census categories. Each census category is considered a sub-population. A PER_s can be considered a score whereby 1 means that the sub-population has exactly the same exposure as the entire population for whatever stressor is being considered.

This approach was so successful that the State of New Jersey has recommended a regulation that imposes the use of our Environmental Justice methodologies and tools for environmental permits across the state.