



new jersey
department of environmental protection

njdep



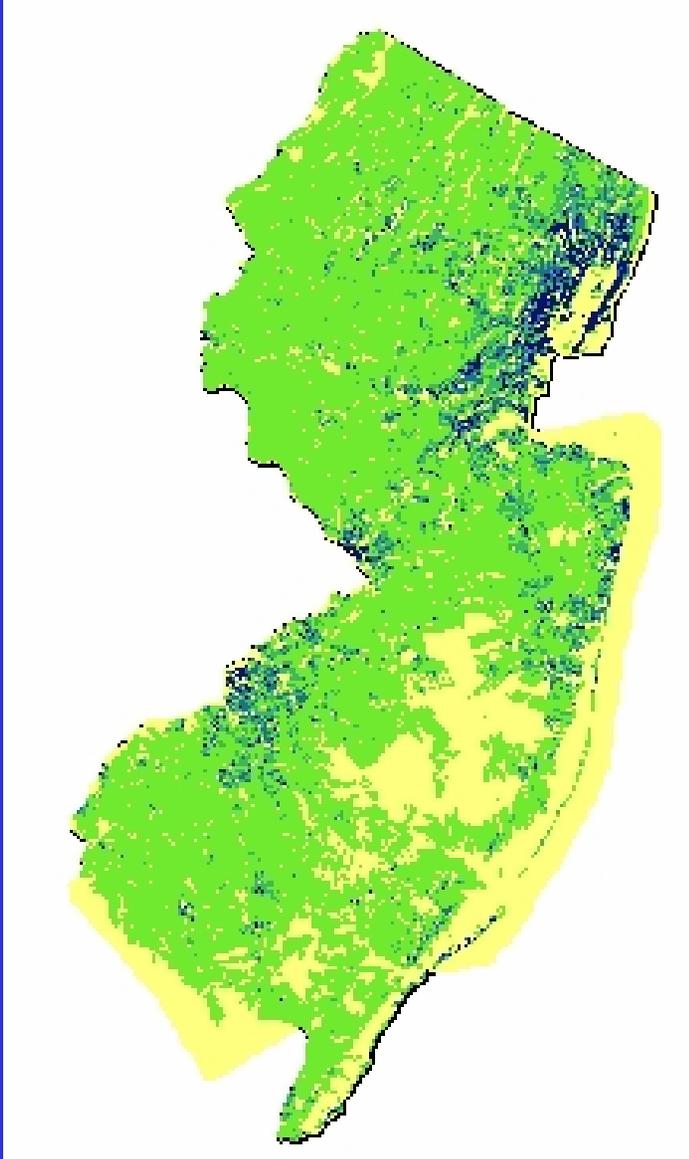
Spatial Analysis Using Census and Environmental Data: Applications for Environmental Justice and Health Tracking

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Overview

- Governor's Environmental Justice Executive Order 96
- Use of Census and Environmental Data
 - Site remediation EJ example
 - Air environmental metrics sharing with NJDHSS for

Summary of NJ Census Data



- Most Densely Populated State
- Highest Household Income
- Diverse Mix of Urban, Suburban, and Rural Areas

Executive Order

- EJ Petition Process for Communities
 - Petitions shall be signed by fifty (50) or more residents or workers
 - Develop Action Plan delineating the steps to reduce existing environmental burdens and avoid or reduce the imposition of additional environmental burdens
- Multi-agency Environmental Justice Task Force
- External Environmental Justice Advisory Council

Executive Order

- Proactive Initiatives

The DEP will use available environmental and public health data to identify existing and proposed industrial and commercial facilities and areas in communities of color and low-income communities for which compliance, enforcement, remediation, siting and permitting strategies will be targeted to address impacts from these facilities

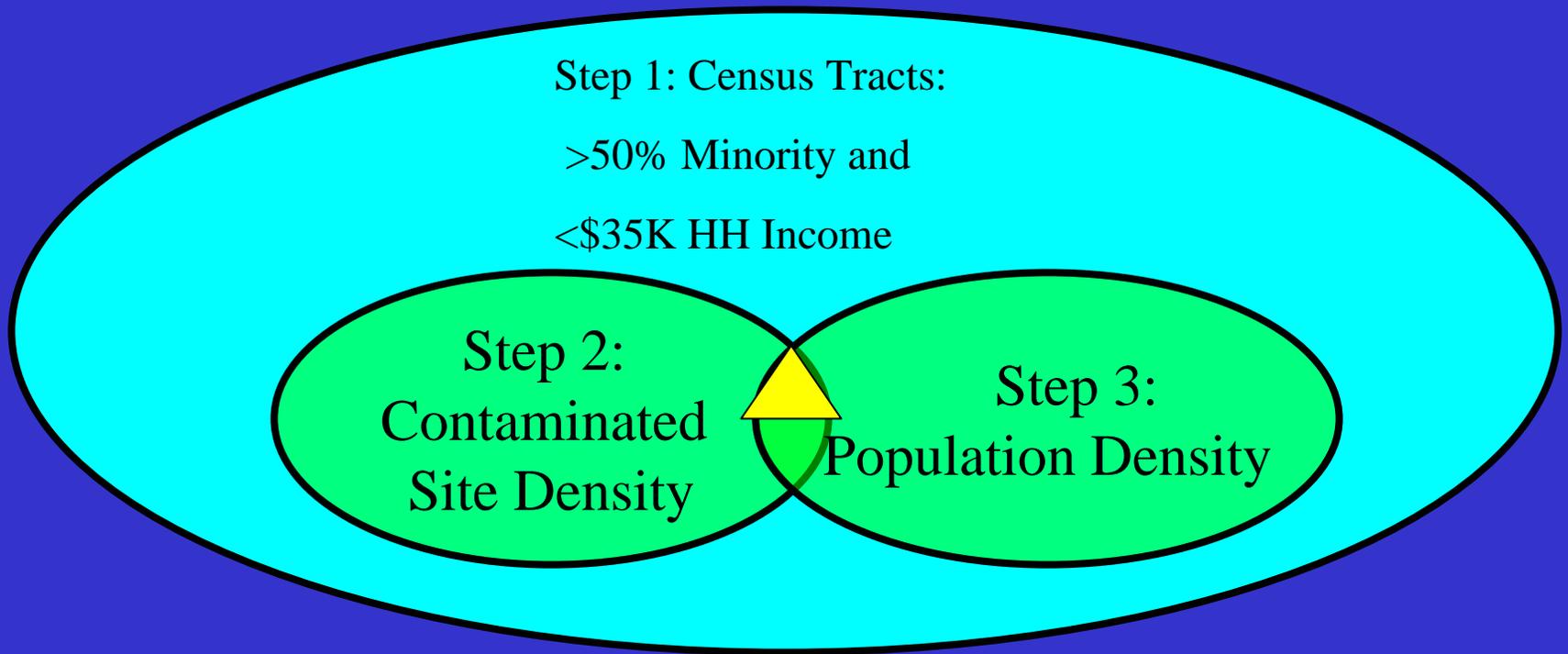
- Site Remediation Initiative

- Start with State-wide Screening of Census and Environmental Data

Goals and Steps for Initiative

- Use a simple screening process to identify census tracts
 - EJ characteristics
 - Large number of sites
 - Large population
- Review data for accuracy in selected tracts
- Address ongoing/continuing discharges

State-Wide Screening



Data used for Screening

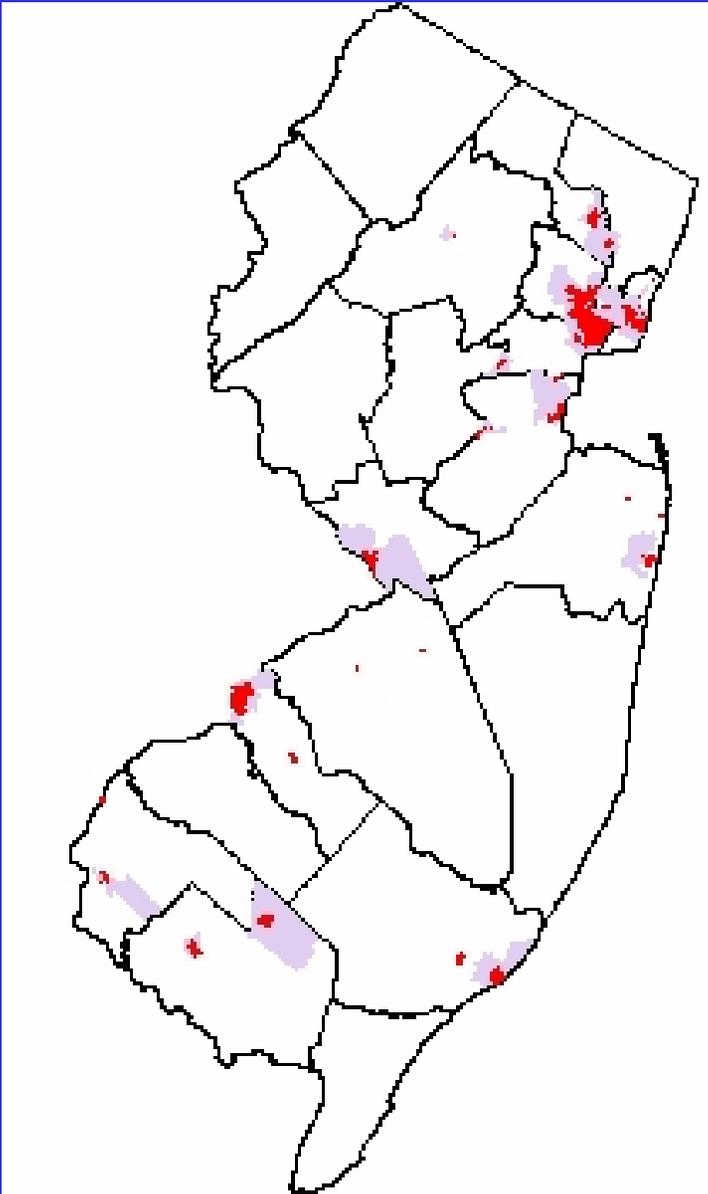
Census Data

- 2000 census data
- Census tract level for SES indicators
- Census block level for population density

Environmental Data

- From centralized computer system (NJEMS)
- Tracks over 15,000 contaminated sites
- Each contaminated site assigned a general “remedial level”
- Analysis used ~ 8,500 sites level C2, C3 and D

Step 1: Census and Municipalities



- >50% Minority and <\$35K HH Income
- 229 Tracts
- 42 Municipalities
- Includes 9.5% of state population

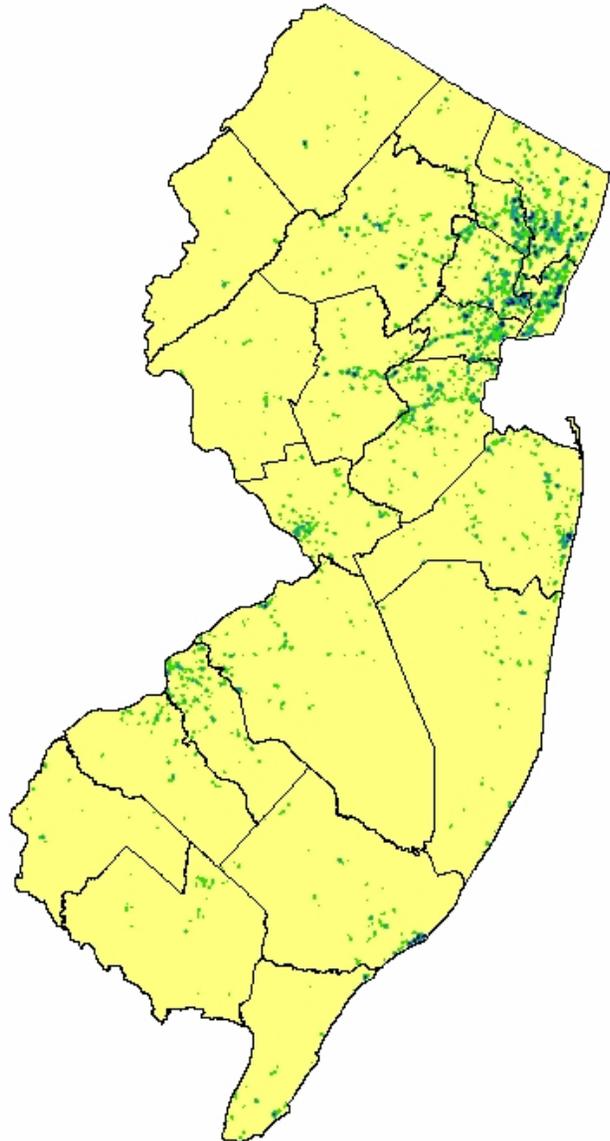
Legend

-  Census Tracts
-  Municipalities

1:1,386,891

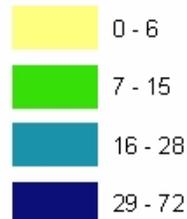
Step 2: Density of Contaminated Sites

- 8,420 sites
- Kernel Density
- 100 meter grid size
- 0.5 mile search radius



Legend

Site Density



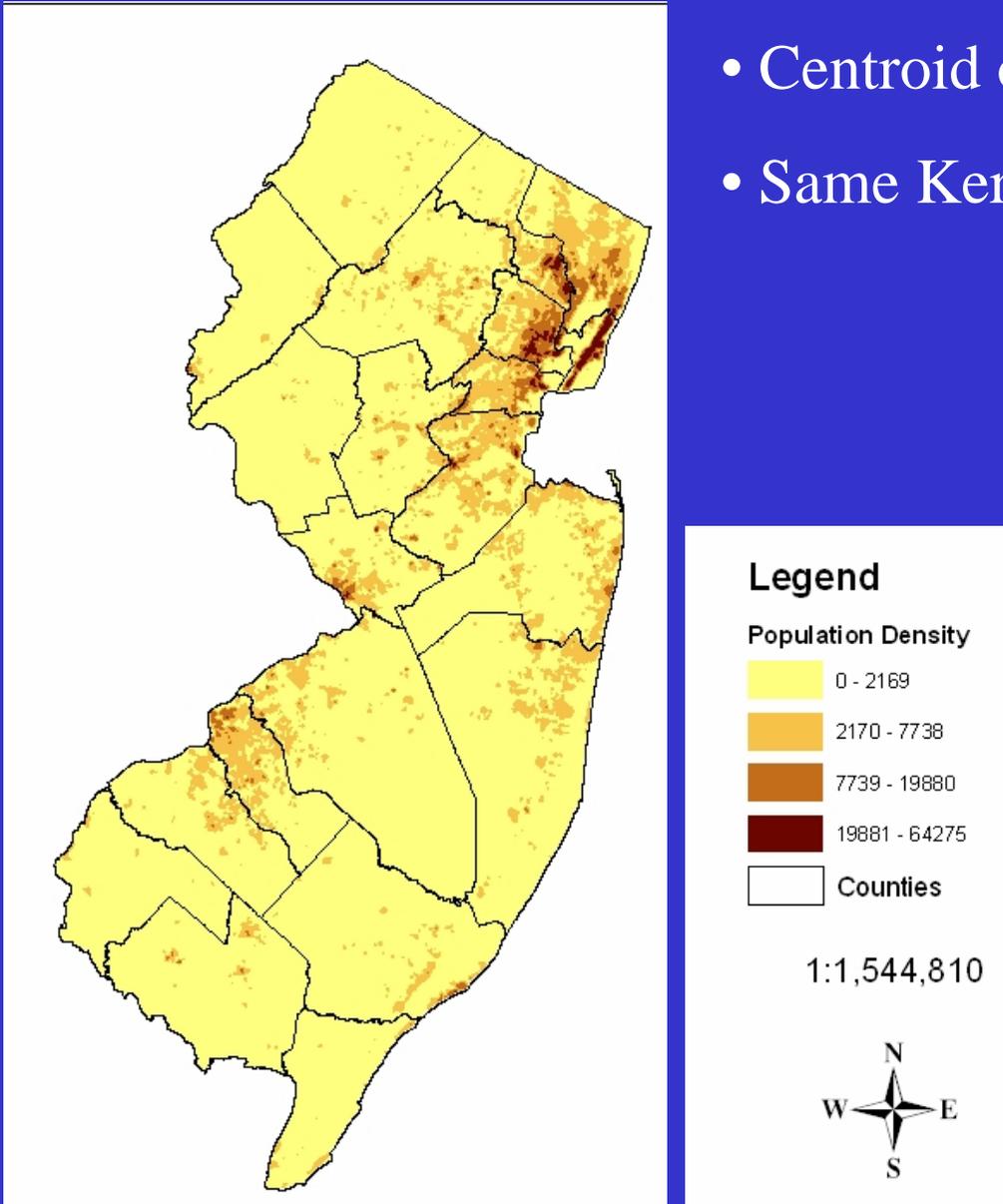
 Counties

1:1,544,810



Step 3: Population Density

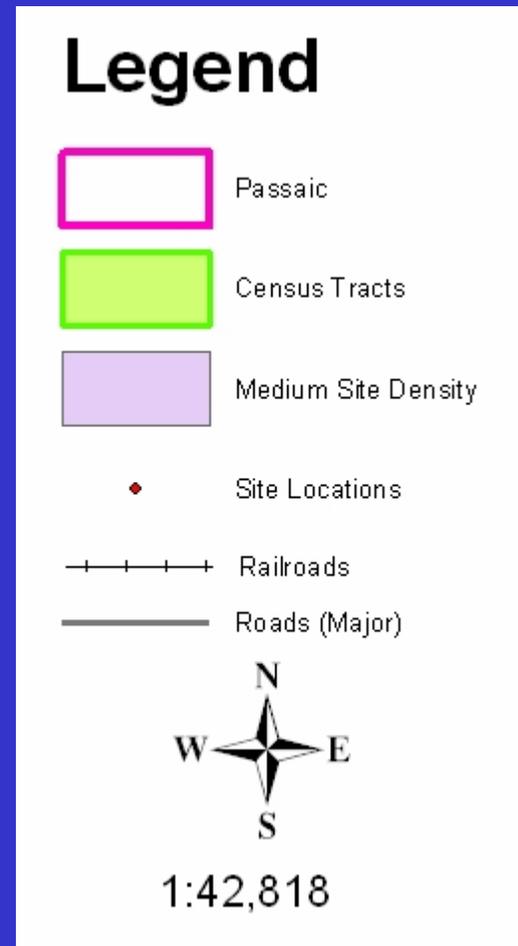
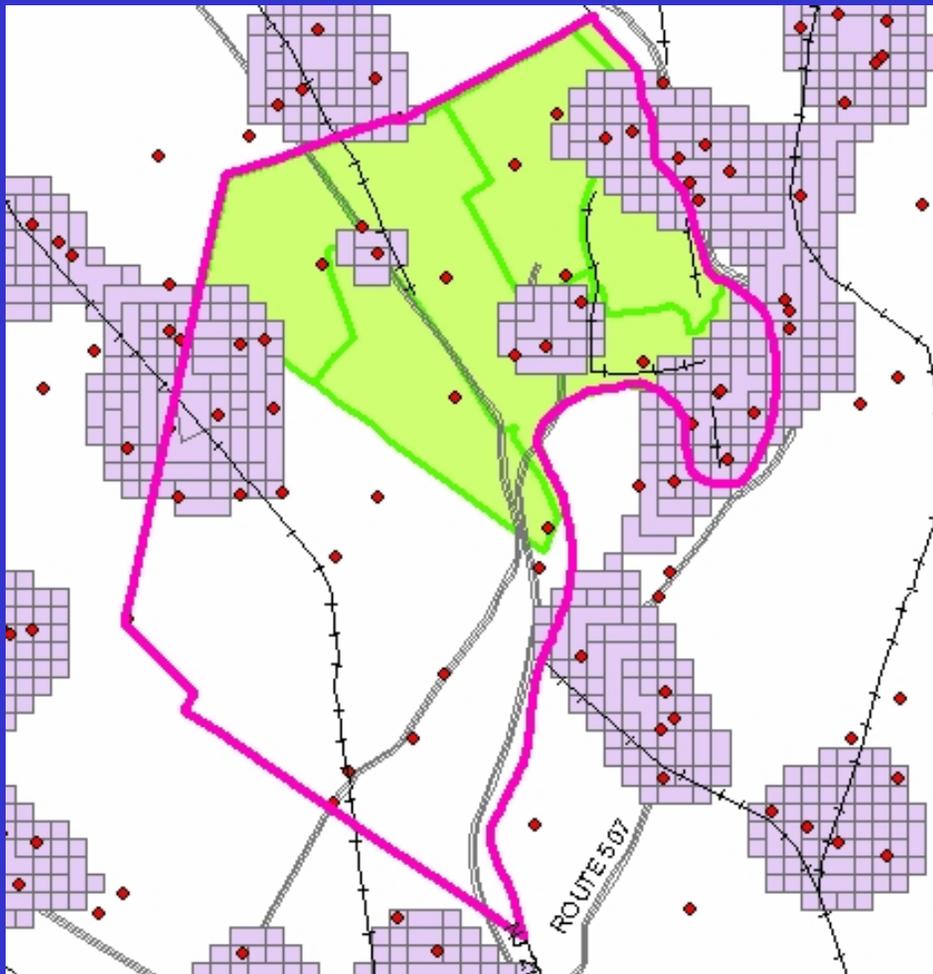
- Centroid of 141,628 census blocks
- Same Kernel density



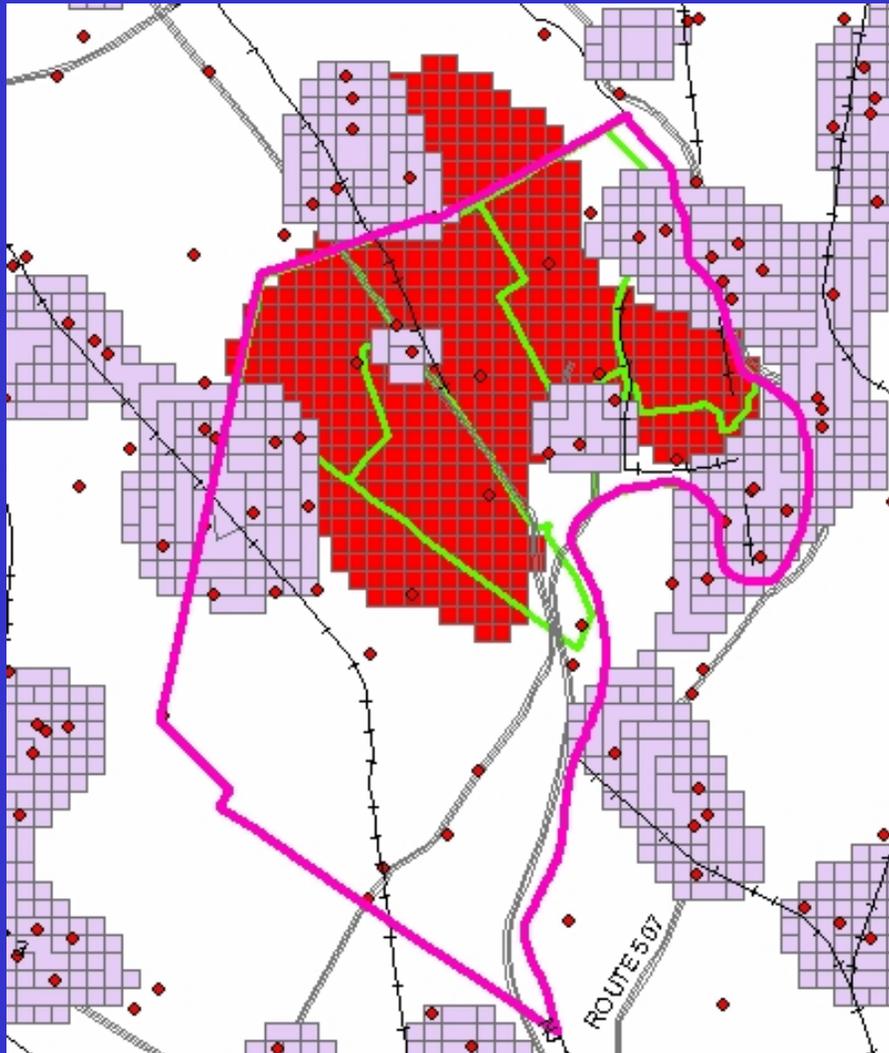
Results of Overlay Analysis

- High Population and Site Density
 - Highest site density in industrial tracts
 - Only 7 of 229 tracts
 - Cleanups underway
- High population and medium Site Density
 - 73 of 229 tracts
 - 13 of 42 Municipalities

Example: Census and Site Density



Example: Population Density



Legend

-  Passaic
-  Census Tracts
-  Medium Site Density
-  High Population Density
-  Site Locations
-  Railroads
-  Roads (Major)

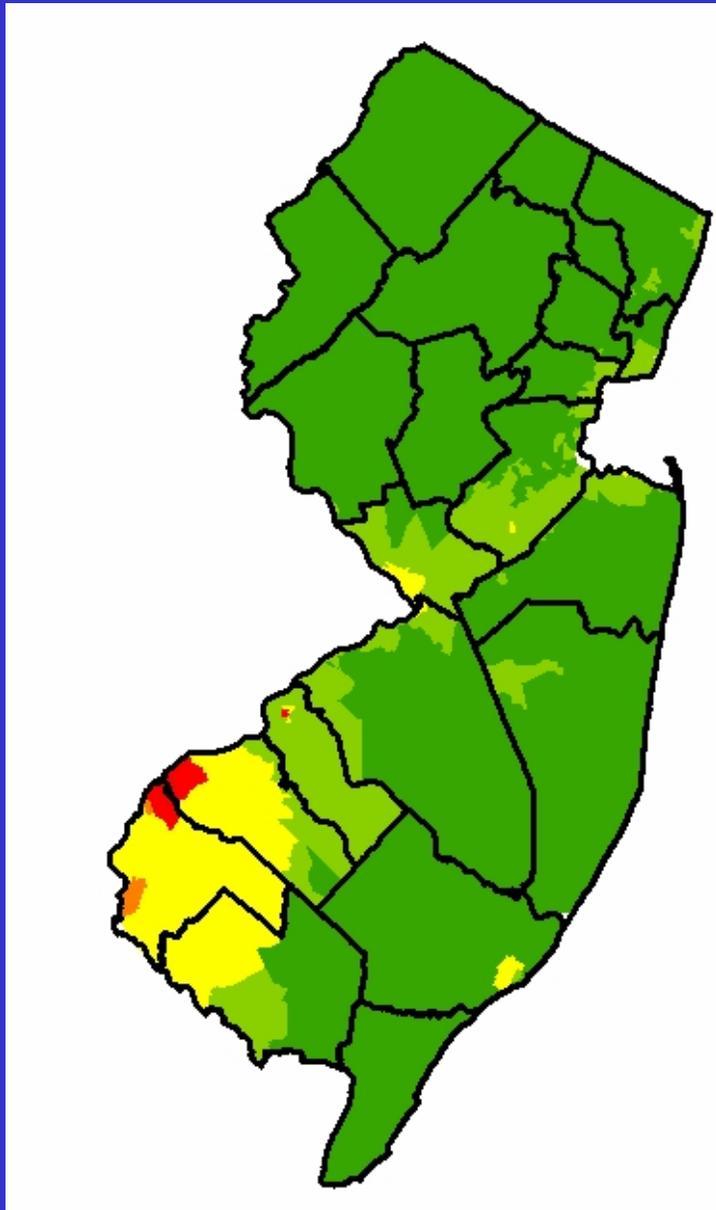


1:42,818

Air Exposure for EPHT

- Three Demonstration Projects working with DHSS
 1. Cancer Incidence/air and drinking water
 2. Adverse reproductive outcomes/exposure
 3. Heavy metal biomonitoring/exposure
- Cancer incidence Project
 - Benzene and Leukemia
 - Vinyl chloride and brain/angiosarcoma of the liver
 - THM and bladder cancer
- Two types of Air metrics
 - EPA's 1996 NATA
 - More recent data from NJ tracking databases

NATA Vinyl Chloride



NJ Average Annual Impact = $5.66 \times 10^{-3} \text{ ug/m}^3$

US Average Annual Impact = $4.87 \times 10^{-3} \text{ ug/m}^3$

Health Benchmark = $.11 \text{ ug/m}^3$

Legend

 Counties

Vinyl Chloride Average Annual Impact

 Under .05 Times Benchmark

 .05 - .1 Times Benchmark

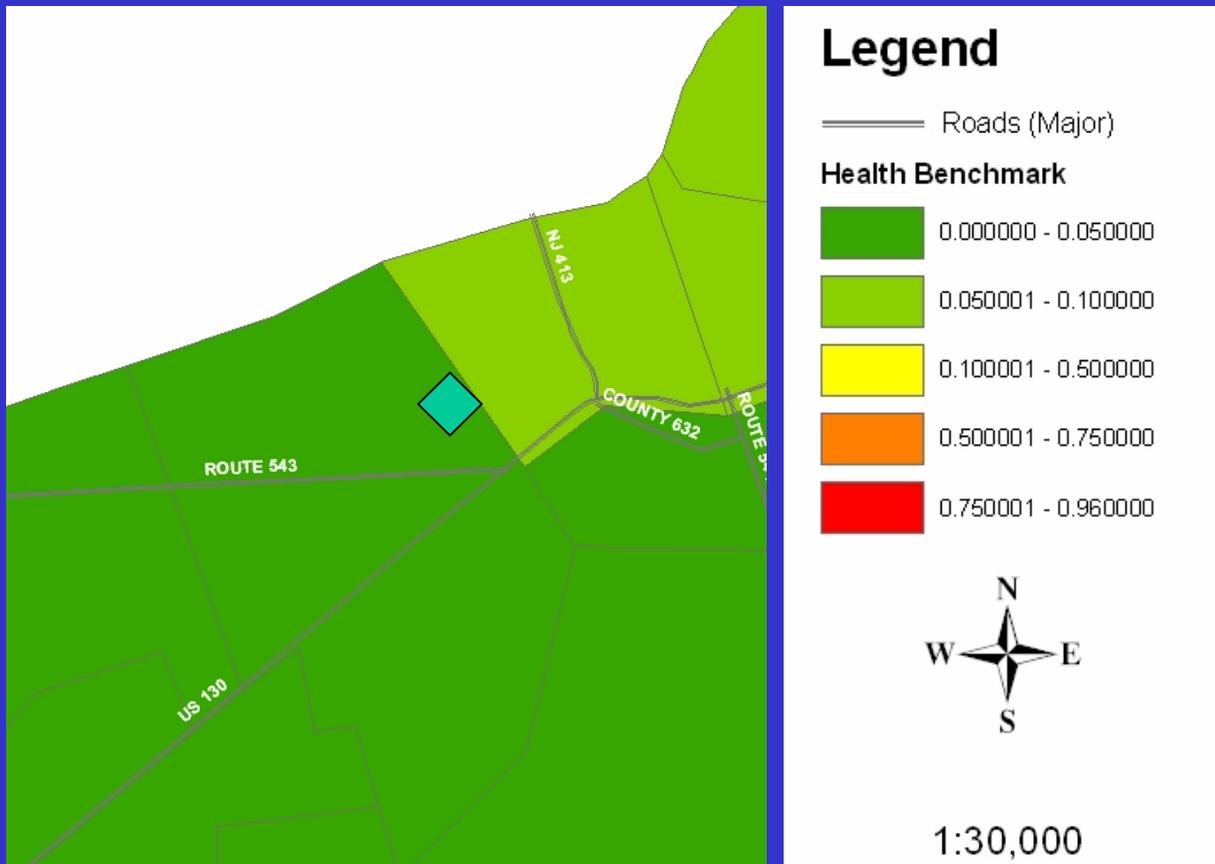
 .1 - .5 Times Benchmark

 .5 - .75 Times Benchmark

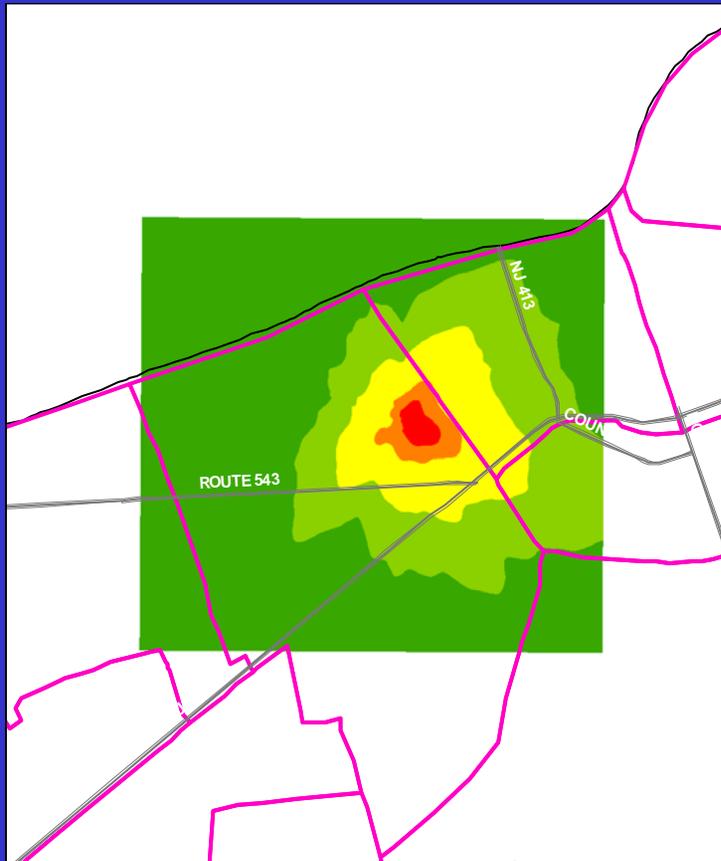
 .75 - .96 Times Benchmark



NATA Vinyl Chloride-Burlington



ISC3 Model Results



Legend

-  Counties
-  Roads (Major)
-  Census Tracts

ISC3 Model

Health Benchmark

-  0.14 - 1
-  1 - 2
-  2 - 5
-  5 - 7.5
-  7.5 - 11

NATA Benzene

NJ Average Annual Impact = 1.66 ug/m³

US Average Annual Impact = 1.39 ug/m³

Health Benchmark = .13 ug/m³

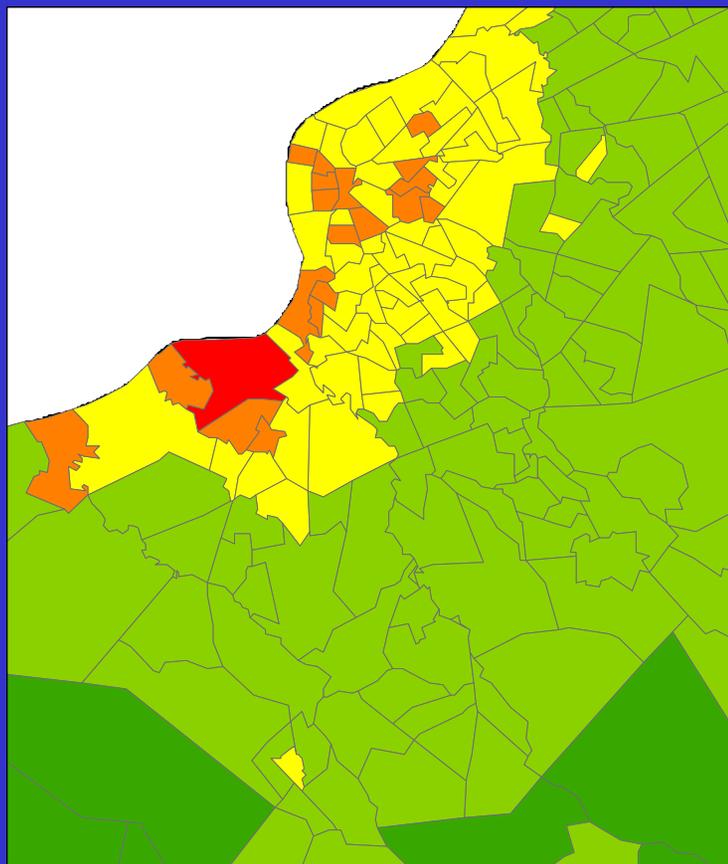
Legend

 Counties

Benzene Average Annual Impact



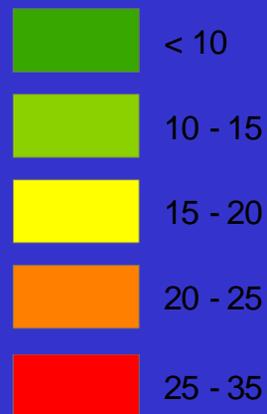
NATA Benzene--Westville



Legend

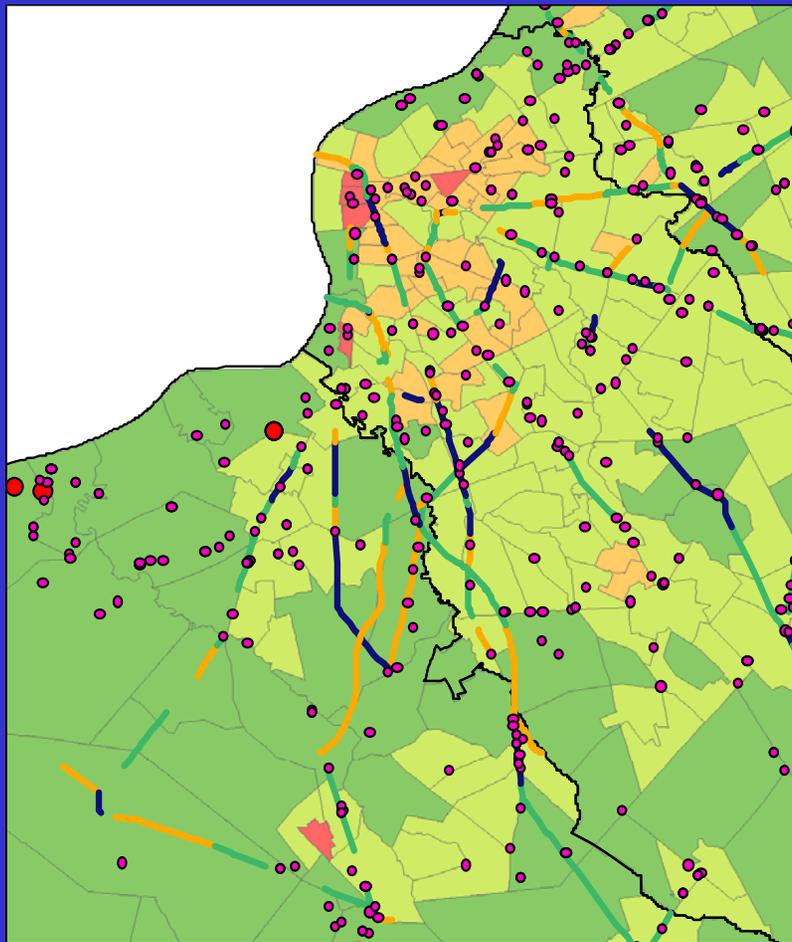
NATABenzeneCensus

Health Benmark



1:180,678

Benzene Tracking Data



Legend

- Benzene source < 8000 lbs/yr
- Benzene source > 8000 lbs/yr

Road Density (Tract)

feet/acre

- 0 - 106
- 107 - 200
- 201 - 318
- 319 - 551

Congested Roads

Volume/Capacity Ratio

- 0.90 - 1.00
- 1.01 - 1.20
- 1.21 - 2.87

1:180,678

