Nationally Consistent Environmental Justice Screening Approaches

MAY 2010

A Report of Advice and Recommendations
of the
National Environmental Justice Advisory Council
A Federal Advisory Committee to the U.S. Environmental Protection Agency

ACKNOWLEDGEMENTS

The National Environmental Justice Advisory Council (NEJAC) acknowledges the efforts of the Nationally Consistent Environmental Justice Screening Approached (NCEJS) in preparing the initial draft of this report. The NEJAC Work Group that prepared this report represented academia, business and industry, and members of community-based organization and dedicated many hours in coordinating their effort.

DISCLAIMER

This Report and recommendations have been written as part of the activities of the National Environmental Justice Advisory Council, a public advisory committee providing independent advice and recommendations on the issue of environmental justice to the Administrator and other officials of the United States Environmental Protection Agency (EPA or the Agency). In addition, the materials, opinions, findings, recommendations, and conclusions expressed herein, and in any study or other source referenced herein, should not be construed as adopted or endorsed by any organization with which any Work Group member is affiliated.

This report has not been reviewed for approval by EPA, and hence, its contents and recommendations do not necessarily represent the views and the policies of the Agency, nor of other agencies in the Executive Branch of the Federal government.

A Federal Advisory Committee to the U.S. Environmental Protection Agency

Nationally Consistent Environmental Justice Screening Approaches

MAY 2010

A Report of Advice and Recommendations
of the
National Environmental Justice Advisory Council
A Federal Advisory Committee to the U.S. Environmental Protection Agency

NATIONAL ENVIRONMENTAL JUSTICE ADVISORY COUNCIL

Executive Council
- Richard Moore, Southwest Network for Environmental and Economic Justice (NEJAC Chair)
- Don Aragon, Wind River Environmental Quality Commission
- Chuck Barlow, Entergy Corporation
- Sue Briggum, Waste Management, Inc.
- Peter Captain, Sr., Tanana Chiefs Council
- Jolene Catron, Wind River Alliance
- Wynecta Fisher, New Orleans Mayor's Office of Environmental Affairs
- Jodena Henneke, Texas General Land Office
- M. Kathryn Brown, University of Cincinnati College of Medicine
- William Harper, Pacific Gas and Electric Company
- Christian Holmes, Global Environment and Technology Foundation
- Hilton Kelly, Community In-Power Development Association, Inc.
- J. Langdon Marsh, Portland State University, National Policy Consensus Center
- Gregory Melanson, formerly with Bank of America
- Paul Mohai, University of Michigan School of Natural Resources & Environment
- Patricia E. Salkin, Albany Law School
- Shankar Prasad, Coalition for Clean Air
- John Ridgway, Washington State Department of Ecology
- John Rosenthall, National Small Town Alliance
- Omega Wilson, West End Revitalization Association
- Elizabeth Yeampierre, UPROSE
- Victoria Robinson, NEJAC Designated Federal Officer (DFO), U.S. Environmental Protection Agency, Office of Environmental Justice

Nationally Consistent Environmental Justice Screening Approaches Work Group
- Sue Briggum, Waste Management, Inc. *(Work Group Co-Chair)*
- Eileen Gauna, University of New Mexico Law School, *(Work Group Co-Chair)*
- Richard Moore, Southwest Network for Environmental and Economic Justice
- Shankar Prasad, Coalition for Clean Air
- Omega R. Wilson, West End Revitalization Association
- Juliana Maantay, Lehman College, Associate Professor of Urban Development
- Paul Mohai, University of Michigan School of Natural Resources
- Russ Lopez, Assistant Professor, Boston University School of Public Health
- Jodena Henneke, Deputy Commissioner, Coastal Resources
- Mustafa Ali, Designated Federal Officer, U.S. Environmental Protection Agency, Office of Environmental Justice

NATIONAL ENVIRONMENTAL JUSTICE ADVISORY COUNCIL

Members:
Don Aragon
Sue Briggum
Chuck Barlow
M. Kathryn Brown
Peter Captain, Sr.
Jolene Catron
Wynecta Fisher
Jodena Henneke
Hilton Kelley
Langdon Marsh
Paul Mohai
Shankar Prasad
John Ridgway
Patricia Salkin
ElizabethYeampierre

May 7, 2010

Lisa P. Jackson
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW (MC1101A)
Washington, D.C. 20460

Dear Administrator Jackson:

The National Environmental Justice Advisory Council (NEJAC) is pleased to submit the report, *Nationally Consistent Environmental Justice Screening Approaches* (April 2010), for the Agency's review. This report discusses screening approaches through the lens of the Agency's Environmental Justice Strategic Enforcement Tool (EJSEAT), in particular, and how such approaches might better identify areas of concern. This report also discusses the principles that should guide the use of such screening approaches, those instances where a nationally consistent screening approach might be appropriate, and those instances where such an approach might be inappropriate or misused.

With the recommendations outlined in this report, the Council took the position that EJSEAT, and other tools that may be developed to identify priority areas with potential environmental justice concerns, should:

- Accurately identify potential areas of concern, with assurance that communities of color and low income communities potentially adversely impacted will be identified;
- Be able to assess temporal changes within those areas;
- Be able to make national comparisons with similar geographical or political units (e.g., among state and tribal governments) based upon uniform criteria;
- Be transparent, and readily understandable by the public and policy makers;
- Be scientifically sound and defensible for the purpose for which it is being used;
- Be practical, based on available data, and include the amount of data necessary for its intended application;
- Be useful to the public and policy makers (and correspondingly, avoid misuse); and
- Articulate strengths and weaknesses of EJSEAT's use for particular purposes.

Key recommendations focus on technical and policy areas, and include both items for immediate action and long-term goals. In particular, the NEJAC recommends that:

- EPA should carefully delineate how EJSEAT and similar tools are to be used. For example, EPA should avoid using the tool in an exclusionary manner where failure to be prioritized in EJSEAT results in a community not being treated as an environmental justice community.
- EPA should undertake a review of the EJSEAT variables to avoid undue weighting of elements, including reexamining age variables and performing sensitivity analyses of each EJSEAT variable to determine the degree to which each variable may influence scoring.
- EPA should expand the environmental indicators used in EJSEAT to include data on soil contamination, surface and groundwater contamination, and nuisance and non-point source pollution.
- EPA should consider broadly the possible uses of EJSEAT and be prepared to address unintended consequences. EPA should create an EJSEAT training program to prevent misunderstanding and misuse of tools like EJSEAT.
- EPA should ensure that, where EJSEAT is used prospectively, it must be part of a community specific (although consistently employed) process to identify areas not captured by the elements of EJSEAT.
- EPA should consult with Native American representatives to develop mechanisms to assure appropriate treatment within the context of the policy, permitting, enforcement, and other decisions the use of EJSEAT will affect.
- EPA should evaluate how EJSEAT might be configured to allow comparisons over time.

On behalf of the NEJAC, I want to express our appreciation for the opportunity to provide meaningful recommendations on these important issues, and look forward to working with the Agency in the future.

Respectfully,

John Ridgway

John Ridgway,
Acting Vice Chair

cc: NEJAC Members
        Cynthia Giles, Assistant Administrator, EPA Office of Enforcement and Compliance
                Assurance (OECA)
        Lisa Garcia, Special Advisor to the Administrator for Environmental Justice
        Catherine McCabe, Deputy Assistant Administrator, EPA OECA
        Charles Lee, Director, Office of Environmental Justice (OEJ)
        Victoria Robinson, NEJAC DFO

TABLE OF CONTENTS

THIS PAGE INTENTIONALLY LEFT BLANK

NATIONALLY CONSISTENT ENVIRONMENTAL JUSTICE SCREENING APPROACHES

A Report of Advice and Recommendations of the National Environmental Justice Advisory Council

BACKGROUND

The Environmental Justice Strategic Enforcement Screening Tool (EJSEAT) was created by EPA's Office of Enforcement and Compliance Assurance (OECA) to serve as "a consistent methodology that would enable OECA to identify communities or areas experiencing disproportionate environmental and public health burdens for the purposes of enhancing and focusing OECA's enforcement and compliance activities in those areas."[1] OECA's desire to improve consistency in EPA's environmental justice program is commendable. For some regulatory functions, there should be consistent logic in approaching environmental justice concerns. For example, it is important to have a way of tracking progress in allocating resources to environmental justice areas in order to demonstrate the effectiveness of a national environmental justice program.

In addition it is helpful to clearly articulate the critical factors to be included when screening for areas of concern so that communities know the standards under which they can seek agency support and assistance. However, it is equally important to recognize that for some purposes, a consistent national methodology strictly applied is not appropriate and screening factors must be supplemented by local information. This report discusses screening approaches through the lens of EJSEAT, in particular, and how such approaches might better identify areas of concern. This report also discusses the principles that should guide the use of a screening approach, those instances where a nationally consistent screening approach might be appropriate, and those instances where such an approach might be inappropriate or misused.

I.   Charge to the NEJAC

The NEJAC initially was charged to gain a basic understanding of EJSEAT and to identify policy-level issues, concerns, potential benefits and uses of EJSEAT. This identification process took place within the context of briefings on EPA's developing programmatic approaches to environmental justice. On December 14, 2007, the NEJAC forwarded to the Assistant Administrator of OECA a letter describing its approach to evaluating EJSEAT, and providing quick feedback about issues and concerns flagged at the outset. The letter also was forwarded to EPA staff working on EJSEAT for their consideration as they continued to refine the approach. Then Assistant Administrator of OECA, Granta Nakayama, requested advice and recommendations from the NEJAC to improve EJSEAT's comprehensiveness, efficacy and accuracy.[2] On the basis of these initially identified issues and the request of the Assistant Administrator, the NEJAC began its consideration of the nature of EJSEAT and its potential uses, and developed a list of initial principles that should shape development of such a tool.

---

[1] EPA, Work Plan for the NEJAC Work Group on Nationally Consistent EJ Screening Approaches
[2] Letter from Granta Y. Nakayama to Richard Moore, Chair of the NEJAC, dated February 4, 2008.

As part of the advisory process, the NEJAC convened a Work Group consisting of members of the Council, outside Stakeholders and members of academia to better analysis its assessment approach. The NEJAC in collaboration with the Work Group gained a deeper understanding of how EJSEAT works and how it appears to operate in early field testing by the EPA Regions. The Council received briefings from EPA staff. OECA in particular answered follow-up questions from Council members and provided EJSEAT data elements, definitions and sources. The Council also requested reports from several Regions performing this testing. It received an informal briefing from one of the regions, but not the final results of any particular field testing. This information, along with original research performed by Work Group members, formed the basis of the recommendations offered in this report.

II.   Initial Principles

At the initial Council meeting following the initial report to the Assistant Administrator, consensus was reached on a number of criteria against which a screening approach would be measured. As general principles, the position was taken that EJSEAT and other tools that may be developed to identify priority areas with potential environmental justice concerns should:

- Accurately identify potential areas of concern, with assurance that communities of color and low income communities potentially adversely impacted will be identified;
- Be able to assess temporal changes within those areas;
- Be able to make national comparisons with similar geographical or political units (e.g., among state and tribal governments) based upon uniform criteria;
- Be transparent, and readily understandable by the public and policy makers;
- Be scientifically sound and defensible for the purpose for which it is being used;
- Be practical, based on available data, and include the amount of data necessary for its intended application;
- Be useful to the public and policy makers (and correspondingly, avoid misuse); and
- Articulate strengths and weaknesses of EJSEAT's use for particular purposes.

As the work of the Council proceeded, these principles were tested against our evolving assessment of EJSEAT and form the central premises of the conclusions in this report.

III.   Process

The NEJAC, through its work group, received extensive briefings from staff working on EJSEAT at EPA Headquarters and the Regions in the course of two in-person meetings and numerous conference calls, including a briefing on early phases of EJSEAT testing in Region III.[3] Four members of the Council's work group were academic experts of national prominence

---

[3] NEJAC received a briefing from the EPA staff in Region III about the Sparrows Point analysis. However, of the tracts discussed, none were flagged by EJSEAT, and it was not explained how EJSEAT was therefore relevant. We were also given a presentation on aspects of the overall regional review. While it was understood that several EPA

about these kinds of evaluative approaches, and the results of their testing of the tool informed and greatly enriched our work. The Council felt strongly that it would need to understand the workings of EJSEAT in considerable detail in order to provide useful advice on both the elements of EJSEAT and more broadly, the principles that should inform the use of EJSEAT or any other methodology for uses ranging from national programmatic to site specific applications.

Three members of the Council's work group, Professors Paul Mohai, Juliana Maantay and Jim Sadd, used their extensive experience with environmental justice communities and the kind of methodology EJSEAT represents to develop a presentation for the NEJAC. Thus, these work group members demonstrated circumstances in which EJSEAT would or would not work, and the reasons for the difference in the usefulness of EJSEAT for certain applications.[4] For example, Professor Sadd, based upon his preliminary environmental justice screening work with Professors Manuel Pastor and Rachel Morello-Frosch, indicated that, in the context of southern California, EJSEAT's results are fairly similar.[5] According to Mr. Mohai and Ms. Maantay, however, the results were at a variance with conditions they have found in the geographic areas that they have extensively studied (Michigan and New York). This suggests that although the results with southern California were similar, this does not necessarily mean that there is sufficient reliability to the EJSEAT method overall.

Along with the discussion regarding the consistency with alternative methodologies, the NEJAC began looking at the various indicators used by EJSEAT and their relative weight in arriving at an overall score. This discussion was rich and textured, informed by the Council's empirical researchers, state environmental regulators, and community members who provided valuable insight as to how the EJSEAT approach may capture—or in some instances fail to capture—the environmental conditions that their communities are experiencing. The discussion of the EJSEAT approach below details some of these deliberations.

IV.   Overview of EJSEAT

EJSEAT is composed of 18 individual variables or indicators. Values for the 18 indicators for each of the approximately 65,000 census tracts in the U.S. have been derived from a variety of publicly available databases. The 18 indicators furthermore have been grouped into four categories, or components, designated as "demographic," "environmental," "health," and "compliance." There are six indicators in the demographic component, six in the environmental component, two in the health component, and four in the compliance component.

Demographic indicators are derived from the 2000 census and include:

- percent persons below the poverty line
- percent persons over 25 not having high school diplomas,
- percent persons under 5 years old

Regions had commented upon EJSEAT, we had requested those comments, but we did not receive them from the Agency.
[4]See Appendix for maps illustrating EJSEAT scoring for census tracts in California, Michigan, and New York.
[5] PowerPoint presentations given by these researchers are included in Appendix D of this report.

- percent persons over 64 years old
- percent households linguistically isolated
- percent persons who are minorities (African American, Hispanic,[6] Native American, or Asian/Pacific Islanders)

Environmental indicators are derived from the National Air Toxics Assessment (NATA) and the Risk Screening Environmental Indicators (RSEI) databases and include:

- NATA cancer risk
- NATA neurological and respiratory hazard index
- NATA non-cancer diesel particulate matter (PM)
- particulate matter (PM)-2.5 concentration
- ozone concentration (8-hour average)
- averaged RSEI risk-related scores for all federally permitted industrial facilities in the census tract

Health indicators, obtained at the county-level for all states and tribal territories in the U.S. but imputed to individual tracts within their respective counties, include:

- rate of infant mortality
- rate of low birth weight

Compliance indicators have been obtained from a variety of databases and include:

- a number of facility registry system (FRS) facilities per square mile
- a computed measure of inspections
- a computed measure of violations
- a computed measure of formal actions

All the respective indicators within a category are combined into a component score. Before combining, each indicator in the category is first normalized by setting the lowest value of the indicator to zero, the highest value to 100, and all remaining values proportionally in between these two end points. The normalized scores for each of the variables within each of the components are then averaged to produce a component score. Each of the four component scores are themselves normalized, again by setting the lowest component score to zero and the highest component score to 100. The four normalized component scores are then averaged to produce a raw EJSEAT score. The raw EJSEAT score is again normalized in the same way as described above. The normalized EJSEAT scores form the basis of ranking census tracts for their environmental justice potential.

An important feature of the EJSEAT normalizing procedure is that it is conducted on a state by state basis rather than for the U.S. as a whole. The highest and lowest values for each of the variables may, and in fact are likely to, differ from state to state. Apparently, EPA's reason

---

[6] The term "Hispanic" is used instead of "Latino" to be consistent with U.S. Census Bureau terminology.

for this is because the Agency believes the State (or tribal) government to be the appropriate geographic unit of analysis, as federal programs often are delegated to state and tribal governments for implementation. However, this method precludes direct comparisons of normalized values across state and tribal territories. For example, a normalized minority percentage of 100 in one state may mean that the largest proportion of minorities in a census tract in that state is 35 percent, while in another state a normalized minority percentage of 100 may mean that the largest proportion of minorities in a tract is 70 percent. In addition to difficulties of making cross-state comparison, the normalizing procedure is also likely to cause difficulties in making comparisons across time as it is likely that EPA will renormalize values with the anticipated availability of newer datasets, e.g., when the 2010 Census data become available.

V.   Review, Evaluation, and Recommendations

The EPA seeks a procedure that will help identify areas within the U.S. where vulnerable populations live and where environmental burdens are concentrated. That EPA is employing publicly available databases, promotes transparency of the EJSEAT ranking system and helps to provide a systematic rather than ad hoc approach to identifying potential environmental justice areas. Because the data are publicly available, it should ideally allow multiple stakeholders to identify strengths and weaknesses of the EJSEAT method. The NEJAC anticipates that with further input from other stakeholders, EJSEAT will continue to evolve and improve as a coarse screening tool. Below, this report discusses in further detail the NEJAC's independent evaluation of EJSEAT and makes recommendations for its improvement.

SPECIFIC FINDINGS

(1) A consistent national approach is needed for some applications: A national screening tool should provide consistency and some technical rigor to EPA's initial screening to identify potentially high impact areas and prioritize areas needing assistance from the agency.

(2) EJSEAT is more appropriate in evaluating the past than charting the way for the future: EJSEAT would need to be used differently where it is an identification of environmental justice areas for prospective action as opposed to a *retrospective* screen to determine whether, for example, past enforcement efforts or past grants had, over time, been focused on environmental justice areas. For these retrospective-oriented reviews, EJSEAT is a good way to see if priority environmental justice areas received relatively more or fewer inspections, faster or slower cleanup, or more or fewer small grants or Brownfields grants. This assessment can offer insights into whether the existing EPA programs are working to alleviate disparities in environmental justice areas, or if more effort or different approaches are needed. Prospectively, EJSEAT also can be useful in a limited way, for example within the NEPA context by showing a rough snapshot of current conditions, as part of a broader analysis being undertaken to assess the environmental impact of a future project involving federal agency action.

When it comes to allocating future resources, however, EJSEAT by itself can only be a very coarse screen, identifying areas of concern, rather than a tool to specifically categorize a

---

A Federal Advisory Committee to the U.S. Environmental Protection Agency

community as being "an environmental justice community" or "not an environmental justice community." This is because, as discussed in finding 3 below, EJSEAT is not able to capture sufficient information to assure comprehensive identification of all environmental justice communities. In this report, the phrase "areas of concern" is used to help convey the point that in many instances, EJSEAT cannot pinpoint environmental justice communities that are fairly small geographically, such as neighborhoods or areas within a metropolitan area, or rural communities. Because of this limitation, if the agency undertakes to compile an annual EJSEAT priority list, such a list must be supplemented by additional analysis (such as local land use data where available) and public comment in order to identify sites where communities have significant environmental justice concerns that the EJSEAT methodology does not sufficiently recognize. The nature of this public comment is further described in Part VII (1) below. This public comment and response approach responds to the principle that, ideally, a more comprehensive environmental justice analysis should be readily understood and accurately identify communities of concern by adding, where appropriate, additional procedures and data to cure the weaknesses of a coarse screening tool like EJSEAT. This particularly holds true for small rural communities, Native American areas, and areas burdened by many unpermitted facilities and other land use activities not captured by the indicators used in EJSEAT.

(3) EJSEAT data has specific limits: Federally-collected data that are available at the national level—and therefore EJSEAT as a tool—do not adequately capture a number of activities within and conditions endemic to environmental justice areas:

- It omits significant sources of environmental justice concern, primarily impacts from facilities and land use activity that occurs without air permits required under the federal programs or activities exempt from TRI reporting. Primarily EJSEAT includes air toxics data submitted pursuant to the Toxic Release Inventory (TRI) reporters and under the National Air Toxics Assessment (NATA). (The limits of TRI data is explained in connection with the expanded discussion of RSEITOT in Part VI (3) below) For the compliance indicator only (not included in the characterization of "environment"), EJSEAT also includes the existence of RCRA hazardous waste treatment, storage and disposal facilities, major facilities with federal reporting obligations under the Clean Air Act, major facilities reporting under the Clean Water Act, and facilities appearing in the federal Permit Compliance System over the past 5 years. However, activities that EJSEAT does not consider include, for example: Clean Air and Clean Water Act minor facilities, Clean Water Act "nonpoint" sources, Clean Air Act mobile sources, small quantity generators of hazardous waste, underground tanks, closed or abandoned facilities and remedial sites, significant releases of toxic air contaminates that are not reported under TRI (because the facility is exempt, or because the chemicals are not listed or are released in amounts that do not trigger reporting requirements), and facilities exempt from permits because of small size, grandfathering, exempted status (e.g., materials that are exempt because they are recycled or are one of the so-called "Bevill wastes" under RCRA). EJSEAT also omits land use activities that can significantly affect environmental conditions but are not captured within a national data base, such as traffic patterns (e.g., heavy truck traffic near landfills) and agricultural activities (e.g. pesticide drift). EPA should make clear in its communications which potential sources of pollution are included in EJSEAT and which are not. It is important to remember that

EJSEAT contains a wide range of environmental information, but it is not exhaustive. Therefore, its ability to convey the full range of environmental effects in a community has limits and EJSEAT should be used with caution. In particular, it should be considered that there is always a possibility of EJSEAT not finding environmental problems in an area where they actually exist.

- Important populations are omitted or undercounted in its demographic indicators - For example, it is often observed that Native Americans and Hispanics are not accurately captured by census procedures. In particular, migrant workers and immigrants tend to be significantly under-counted. With regard to Native Americans, the misrepresentations that can occur with EJSEAT, and the actions that should be undertaken to correct this, are complex. As noted in Appendix E, appropriate application of EJSEAT to Native Americans should begin with specific consultation with tribes in order to understand the relevant data bases (and their limitations).

  o The underlying data sources do not reflect actual monitoring, but rely on standardized dispersion modeling that may not be adjusted for local conditions, and may not reflect long-range transport of contaminants.
  o It does not adequately capture populations that might be experiencing certain vulnerabilities (see discussion of health data Part VI (3) below).
  o Not all data sets are at the same spatial resolution. For example, the health indicators are at the county level, whereas all other indicators are either at the census tract level or are point locations. EJSEAT is largely air focused and does not adequately capture concerns about surface and ground water; soil and land contamination; nuisances (like noise, traffic and odor); and non-point source pollution like pesticide runoff and drift.
  o Much of the data that EJSEAT uses are data that have been generated under EPA's regulatory authorities; however there may be other impacts regulated by other federal agencies that do not find expression in EPA data gathering and thus may not be captured within EJSEAT.
  o EJSEAT has a number of other important limitations. For example, it does not include qualitative data. These data are essential for understanding how environmental threats, or the lack of environmental amenities, affect the quality of life of residents in communities. They may provide important additional information for evaluating the nature and severity of risks. For example, groundwater contamination or discharges to waterways may have a greater impact in areas where residents rely on wells or local water sources for drinking and residential uses. They may have less impact in areas that draw on water provided by large scale and remote water sources. EJSEAT may also not capture environmental issues that do not fall under the EPA's statutory authority such as problems with the built environment, e.g. a lack of grocery stores, sidewalks, or recreational open space, or a problem with a lack of street connectivity. Evidence suggests that these are important factors for health, but they are outside the scope of EJSEAT.

(4) Some of the indicators currently used in EJSEAT might not adequately help identify highly impacted areas: The inclusion of some of the indicators within certain categories of EJSEAT should be reconsidered. Moreover, EPA's test evaluation of EJSEAT revealed that

some indicators currently have relatively more influence on the overall EJSEAT score. Some of these problematic indicators pertain to compliance, health, age, and RSEITOT.[7]

Compliance Factors: The compliance category currently contains four indicators: inspections, violations, formal actions and facility density. However, in the violations indicator, for example, there is no distinction between a serious violation (one significantly impairing air or groundwater) and one with no material environmental impact (administrative errors with no physical impact and no suggestion of a pattern of non-compliance). Similarly, in the formal action indicator, there is no distinction between repeat serious violators and those with a single violation in one year.

This is indicative of a larger problem. EJSEAT cannot reflect the complexities and nuances of an enforcement regime that is shared by EPA, the state and tribal governments, regional enforcers, and private enforcement actions taken by citizens. For example, as noted above, EJSEAT methodology uses number of inspections and number of violations as indicators of an area of concern. Yet, some facilities may be more likely to be cited for violations because they fall into one of EPA's enforcement target sectors; yet other facilities—not in that sector but presenting greater environmental risk—may not have been inspected and therefore not cited for non-compliance. Some facilities are subject to literally thousands of requirements and opportunities for non-compliance, yet pose far less risk than other facilities with fewer (or no) regulatory requirements.[8] When it comes to inspections, the constantly inspected facility with a few violations is likely to pose far less of a risk of noncompliance (and thus less of an adverse impact) than a facility rarely inspected.

State enforcement adds another layer of complexity. What would be cited as a violation in one state may be ignored in another state. The presence or absence of citizen suit enforcement in an area might also affect the rate of inspection or public enforcement. Tribal resources (or lack thereof) might also affect enforcement efforts as well. There is also a difference in philosophy taken by the various enforcers, with some enforcement agencies using a deterrence model and some using a cooperation model. The extent to which these models predominate in any enforcement program affects the rate of violations and other formal actions.

In addition, there are concerns about the way in which the variables, "Number of Facilities Not Inspected," "Number of Violations", and "Number of Formal Actions," are constructed. In the case of these variables, the *number* of cases/incidents is multiplied by the *percentage* of cases/incidents. To us, this appears somewhat tautological. More importantly, it does not correlate well with any known patterns of environmental exposure disparity and other indicators of environmental injustice. This allows no meaningful interpretation of the resulting values. Indeed, when mapped in Michigan, and New York, census tracts appeared randomly distributed based on Inspections, rather than being concentrated in areas where industrial activity is occurring. When mapped to census tracts in southern California and compared to another environmental justice screening method in development for that State, tracts with high values for

---

[7] EPA, August 5, 2008, Staff Draft EJSEAT Questions and Answers for the NEJAC Working Group
[8] For example, hazardous waste reclaimers are not regulated as hazardous waste treatment, storage and disposal facilities, but their processes may be similar and pose similar environmental risks.

the "Number of Violations" shows reasonable correlation with that method's cumulative impacts score, but the other two compliance variables do not.

At the same time, no variation was apparent among the census tracts based on Violations and Formal Actions, i.e., all census tracts in Michigan and New York had the exact same values based on these latter two indicators. A subsequent analysis by one of the technical experts within the Council's work group found no variation existed among the census tracts based on Violations in 37 of the states and tribes, while no variation existed among the census tracts based on Formal Actions in all 50 states (see Appendix B). This suggests significant errors in the scoring.

In summary, compliance statistics are so uncertain in meaning that their use as an indicator is highly questionable. The NEJAC strongly recommends that such statistics be omitted from EJSEAT, in particular in applications involving targeting enforcement resources.

Health Factors: A focus on health is critically important and is central to the issues raised by environmental justice areas. EJSEAT has a health category that has two indicators, percent infant mortality and percent low birth weight. This category comprises one-fourth of the total EJSEAT score. However, low birth weight is too problematic to serve as a useful surrogate for community health. One external commentator on EJSEAT noted that the low birth weight indicator might actually distort the accurate identification of Hispanic populations.[9] Moreover, the Office of Compliance's testing of EJSEAT indicated that low birth weight is only a moderate predictor of census tract-level health, and infant mortality is in fact a weak predictor.[10]

The weakness of these measures in indicating community health is compounded by the way that this information is reported—by county rather than by census tract. [11] The county-wide data render the health factor highly inexact. To illustrate, county-wide data cannot meaningfully reveal specific communities within the county that may be experiencing the largest percentage of low birth weights or infant mortalities within that county, masking areas of concern within larger counties. As a result of the distortion that might occur from using these data, we recommend the health category be omitted from the analysis. If the EPA should elect to reject our recommendation, at the very least we recommend that health indicators be added as one factor in the "social vulnerability" category. In this manner, these health indicators can be taken into account, but they will not have such a substantial impact on the final EJSEAT score.

While the NEJAC understands that impacts to public health are an important reason generally for taking aggressive action, our technical researchers believe it is unacceptable to use county level with tract level data in the way that is currently used in EJSEAT – it is referred to in empirical research as an "ecological fallacy" that should be avoided. If it is used within EJSEAT, it should be accompanied by an explanation that the use of such information is essentially a compromise to accommodate the limited data that exist at this time. To use health data in a screening approach is desirable, but the data should be much better developed before

---

[9] Summary of External Comments to EJSEAT
[10] October 20, 2008 slide presentation "Analysis of Census Tract-Level Health Data in Maryland." See Appendix E
[11] Only Maryland and California have census tract level data available

doing so. Some states and tribes report data for birth outcomes at a much higher level of geographic resolution (census tract or zip code), and EJSEAT could be made much stronger if more consistent reporting can be achieved. However, the current limitations of the health data in EJSEAT underscore the need for continued efforts to improve and incorporate better health data into screening tools such as EJSEAT.

Age: Currently, EJSEAT has two age indicator categories, one for under 5 years and another for over 64 years of age. The NEJAC endorses the use of the under 5 years of age category but some within the work group have concerns with the over 64 years of age category.

Although age can be an appropriate surrogate for vulnerability generally, with greater vulnerability occurring at early as well as late stages of life, there currently is no published evidence to suggest that environmental burdens are distributed disproportionately by age. Indeed to the contrary, a recently published article (see November 2009 issue of the *American Journal of Public Health*) finds that people over the age of 64 are less likely, not more likely, than the general population to live near sources of industrial pollution. Furthermore, two of the technical experts within the work group NEJAC found that census tracts with higher than average percentages of those over 64 were located in the wealthier suburban areas of Detroit and New York City. Thus, the Council is concerned that using age indicators will not lead to areas that are vulnerable due to location near high impact areas. Moreover, it may confound the analysis in several ways. For example, while the elderly may be more vulnerable, they may be concentrated in areas with no recognizable environmental justice component, such as in relatively affluent suburbs with little pollution. To report elder vulnerability separately may give relatively well-off populations more weight than might be appropriate, especially considering that additional indicators of social vulnerability (such as percent unemployed and percent female-headed households) are not currently considered in the social demographic category. One of the problems, for example, with using percent over 64 is that areas with high concentrations of the poor, poverty, and pollution are also areas that tend to have shorter life expectancy. For these reasons, some members of the Council feel that the over 64 age category should be removed from EJSEAT. In its place, additional factors indicating social vulnerability might include per capita income, percentage of home ownership, percentage unemployed, percentage of female-headed households, and presence of schools. Most of these have been examined in the environmental justice literature and are better indicators of social vulnerability and of where disproportionate environmental burdens exist than age.

Other members of the Council feel that the over age 64 variable should be retained. It is well documented that the elderly, in addition to children and those with pre-existing serious health problems, are especially vulnerable to the non-cancer effects of air pollution, as compared to the general population.[12] While it is true that some census tracts that do not otherwise fit the general description of an overburdened community (exposure to environmental hazards, other SES variables, etc.) do contain concentrations of elderly resident, these areas would not likely be misclassified or otherwise highlighted by EJSEAT because this age variable is only one of many indicators used to calculate the final EJSEAT score –wealthy suburbs with high concentrations

---

[12] There is also substantial evidence that children are more sensitive to cancer-causing chemicals from air pollution

of elderly would not be expected to be at the upper end of the range of EJSEAT scores. However, if there are two census tracts that are equal in all variables except the over 64 age category, the tract with a higher percentage of elderly residents does have a greater burden and should receive an incrementally higher EJSEAT score. Because EJSEAT uses many other indicator variables in addition to the over 64 age category, its impact is likely marginal.

The NEJAC agrees that the percentage under 5 years of age is entirely appropriate and should be retained it EJSEAT. This variable was not found to produce distortions in EJSEAT. That is, its inclusion does not result in a pointing away from census tracts reflecting environmental injustice characteristics of over-concentrations of pollution, minorities, and the poor. Indeed, areas where those under 5 years of age are concentrated are likely areas where life expectancies are shorter due to high pollution burdens and low economic resources.

Thus, the under 5 social indicator should not be omitted nor combined with over 64. The concern and caution include an under-valuation or weighting of air quality impacts on under 5 health impacts related to disproportionate and adverse impacts on long-term quality of life (longevity, diminished health in formative and educational years, as well as insurability for quality healthcare). Under 5 concerns also takes into consideration the future capacity for future full/active employment for low-income minority/tribal populations that currently are carrying a disproportionate share of under and unemployment.

RSEITOT: One of the EJSEAT environmental indicators is a measure of exposure from facilities that report to the Toxic Release Inventory (TRI). This indicator is taken from US EPA's Risk-Screening Environmental Indicators (RSEI) project, which was created by EPA to provide a more complete assessment of the information contained in the TRI. The EPA Office of Pollution Prevention and Toxics processes the TRI data on the quantity of each chemical reported released by each facility to create the RSEI (for details, see http://www.epa.gov/oppt/rsei and OPPT 2004). The EPA combines three methods to assess the human health risks posed by each release: (1) fate and transport, or how the chemical spreads from the point of release to the surrounding area; (2) toxicity, or how dangerous the chemical is in terms of chronic human health effects on a per-pound basis; and (3) population exposure, or how many people live in the affected areas. These values are referred to as facility "RSEI scores," an estimate of the total human health hazard due to contributions of individual chemicals to the facility's total score.

The EPA calculates the total chronic health risks (cancer and non-cancer) from toxic air pollution using toxicity weights and inhalation factors for the underlying chemicals reported by every facility in the Toxics Release Inventory (TRI). It then uses a fate-and-transport model that estimates exposure levels in each of more than 10,000 one-kilometer-square "grid cells" around the facility. The RSEI process then overlays the grid of toxicity-weighted air concentrations with a conforming grid of population data matched from census block-level data from the U.S. Census to measure total population risk from each release. As EPA's primary objective in creating RSEI was to help federal and state agencies set priorities for environmental protection, the raw data are aggregated (across chemicals and across impacted population) on a facility-by-

facility basis. The facility-wise RSEI scores, a source-based measure, are made available to agencies and the public on the RSEI public release data CD-ROM.

It is possible to average these facility scores by census tract, allowing calculation of an averaged tract-level score. EJSEAT appears to be using this tract score as the variable RSEITOT. If the data came from a pre-2006 release of the RSEI information that is distributed by EPA on the RSEI CD-ROM, it might be both wrong and inaccurate. However, a team of university-based researchers (including two members of the work group) were provided with all of the geographic micro data for individual grid cells nationwide. These researchers discovered significant errors in the geographic model used in RSEI score calculations that make it impossible to obtain accurate tract-based scores. They have corrected this problem and reported the fix to the EPA and the consulting company that is charged with RSEI database maintenance and calculations, but RSEI CDs have not been corrected. It appears likely that the RSEITOT values used in EJSEAT are uncorrected or otherwise in error. When mapped in California, Michigan, and New York, the patterns of RSEITOT values with census tracts appeared randomly distributed based on RSEITOT, rather than being concentrated in areas where industrial activity is occurring. Furthermore, it was found that for 74% of the census tracts in the U.S., the RSEITOT values are missing. This variable needs clarification and possible modification, before we can constructively comment on its use or appropriateness for EJSEAT.

What is needed is a measure of ground-level pollution burdens at the tract level that reflect the contributions of multiple facility sources, both within and proximate to the tract, to the total ambient pollutant concentrations for that tract. One broad overall measure that comes from the RSEI program is the toxicity-weighted exposure for census tract residents, which can be calculated by summing all reported emissions from all TRI sources that accumulate in any census tract, appropriately weighted by the accepted toxicity value for each chemical. The NEJAC recommends that EJSEAT adopt this metric as the environmental indicator that represents TRI reported releases.

Moreover, EPA will need to explain clearly the limits of the Toxic Release Inventory (TRI) so there will be no misunderstanding of the scope of information conveyed by TRI and thus incorporated in RSEITOT and EJSEAT. These limits include:

- Only selected industrial sectors or polluting activities (limited to 23,000 facilities in the U.S.) and selected chemicals (approximately 650 at present) are included in TRI.
- Within the selected sectors and activities, facilities with fewer than 10 full-time employees are exempt from reporting.
- Facilities releasing toxics each year at levels under the reporting threshold set for an individual chemical (or in a form different than that designated for reporting - in dust or fibrous form, for example) are exempt from reporting.
- Limitations on regulation and data gathering obligations authorized under federal environmental statutes (e.g., grandfather clauses, toxic materials sent for recycling without intervening processing) will transfer to limits on TRI data.

As a result, many facilities and activities of concern to environmental justice communities will not be captured in the TRI/RSEITOT data. For this reason, the NEJAC recommends in the subsequent section that EPA "ground truth" its use of EJSEAT with active outreach to potentially impacted communities in order to assure that conditions actually on the ground are consistent with what is in the data sets and ultimately, what the analysis reveals.

Percent minority population: Within EJSEAT, percent minority is one of six indicators in the Social Demographic category that comprises one-fourth of the overall ESJEAT score. The NEJAC has frequently observed over the years that the legacy of racial and ethnic discrimination has real impacts in terms of communities' health and welfare, as well as their vulnerability to environmental stressors. Empirical data reveal a strong correlation between race and environmental stressors, such as proximity to polluting facilities and exposures to certain chemicals. Other studies reveal racial correlations to actual health effects, such as high blood lead levels and asthma. Thus, this is a reliable indicator whose weight should not be diluted by including less important or indeed in some cases erroneous, variables within the overall EJSEAT score.

Facility density: Currently, in the compliance category, EJSEAT uses facility density (number of facilities captured in the fields of national data included in EJSEAT) as one of the compliance indicators. Facility density is one of the cornerstones of cumulative risk and impact, and is a vital component of EJSEAT. It is given insufficient weight in EJSEAT, however. For example, an analysis by one of the technical experts in the NEJAC work group found that when the 18 indicators are grouped into their components, the Health component was the most influential, having twice the impact on the EJSEAT score as compared to the Compliance, Demographic and Environmental components. Moreover, within the facility density category itself, all facilities that have at least one permit are counted equally. Thus, a huge refinery with multiple permits counts the same as a small facility with one permit. The configuration of EJSEAT also should be adjusted to accord this feature sufficient weight.

(5) The Categories of measures currently used in EJSEAT result in over-weighting of some categories:

As indicated above, currently EJSEAT uses 4 main categories of analysis: social demographic measures (with 6 different indicators), environmental measures (with 6 different indicators), compliance measures (with 4 different indicators) and health measures (with 2 indicators). Each of these four categories carries equal weight, despite the fact that they have different numbers of indicators within them. As a result, of 18 indictors overall, some of the indicators have a relatively higher weight in the overall score than indicators in other categories. For example, low birth weight is only one of two indicators in the health measure, while percent in poverty is one of six indicators in the social demographic indicators. Birth weight, an unreliable indicator, is weighted more heavily in the overall score than is percent in poverty, a very reliable indicator. Moreover, we believe that race is an appropriate factor in EJSEAT, and currently its relevance may be unintentionally diluted in the EJSEAT methodology by including the compliance and health variables.

As a result of NEJAC's review of the various EJSEAT indicators and their relative weight in arriving at an overall score, the Council recommends, to increase overall reliability, the main measures in EJSEAT could be reduced to two categories equally weighted: social vulnerability and environmental burden. Environmental burden would include the current environmental indicators plus facility density. Social vulnerability would include the current demographic factors as modified in the discussion above. For illustration purposes, the EPA may elect to reorganize the categories in the following manner:

- Environmental burden
  - NATA cancer risk,
  - NATA neurological and respiratory hazard index,
  - NATA non-cancer diesel particulate matter (PM),
  - particulate matter (PM)-2.5 concentration,
  - ozone concentration (8-hour average), and
  - averaged RSEI risk-related scores for all federally permitted industrial facilities in the census tract
  - Facility density
- Social Vulnerability
  - percent persons below the poverty line,
  - percent persons over 25 not having high school diplomas,
  - percent persons under 5 years old,
  - percent households linguistically isolated, and
  - Percent persons who are minorities (African American, Hispanic, Native American, or Asian/Pacific Islanders).
  - Rate of low birth weight or rate of infant mortality, especially if available at the census tract level.
  - An additional factor indicating social vulnerability, such as per capita income, percentage of home ownership, percentage unemployed, percentage of female-headed households, and presence of schools.

Reduction to two categories accurately highlights the two main factors central to environmental justice concerns, will better balance appropriate indicators, and may compensate for the fact that certain indicators in both categories contain data that are not optimal (e.g., too few sources of environmental burden are accessible in the national database, census data may undercount certain minority populations and health data are too limited to be useful at all).

In short, distortion occurs when there are an unequal number of variables in each major category. As EPA ultimately decides what variables to retain within each major category—or in the future may decide to add additional variables—in all cases the EPA must make sure that inappropriate overweighting or corresponding dilution does not occur, for example, by performing a sensitivity analysis to see the impact of the overall category configuration ultimately chosen.

(6) Alternate methods of normalizing indicator, category, and EJSEAT scores:

  The current method of normalizing in EJSEAT assigns zero to the lowest value of an indicator and 100 to the highest value. This method of normalizing is also applied to the four component scores and to the composite EJSEAT score. In lieu of this kind of normalizing the NEJAC recommends that z-scoring (subtracting from values the mean value and dividing by the standard deviation) be used instead as it appears to better differentiate census tracts. This observation is based on analyses performed in California and Michigan by technical experts of the Council's work group (see Appendix). There are several advantages for using z scales. They allow for a better identification of areas with high effects, they control for the differing ranges of the various sub-indicators, and they use a greater detail of the data, allowing for a more refined consideration of the data.

(7) The current EJSEAT methodology limits its usefulness for certain applications:

  As indicated above, under the methodology that EJSEAT employs, the data are normalized to a standard scale that somewhat suppresses the range of results. In addition, the data are normalized each time an EJSEAT score is recalculated. Because of this, scores cannot be compared over time. This impedes the ability of the agency to identify historically exposed areas and track progress in that community. Normalizing also makes it difficult to compare state-by-state performance over time. In addition, EJSEAT includes population and facility density factors that will underweight rural populations and communities with few but very large or very polluting facilities. These points are discussed in greater detail below.
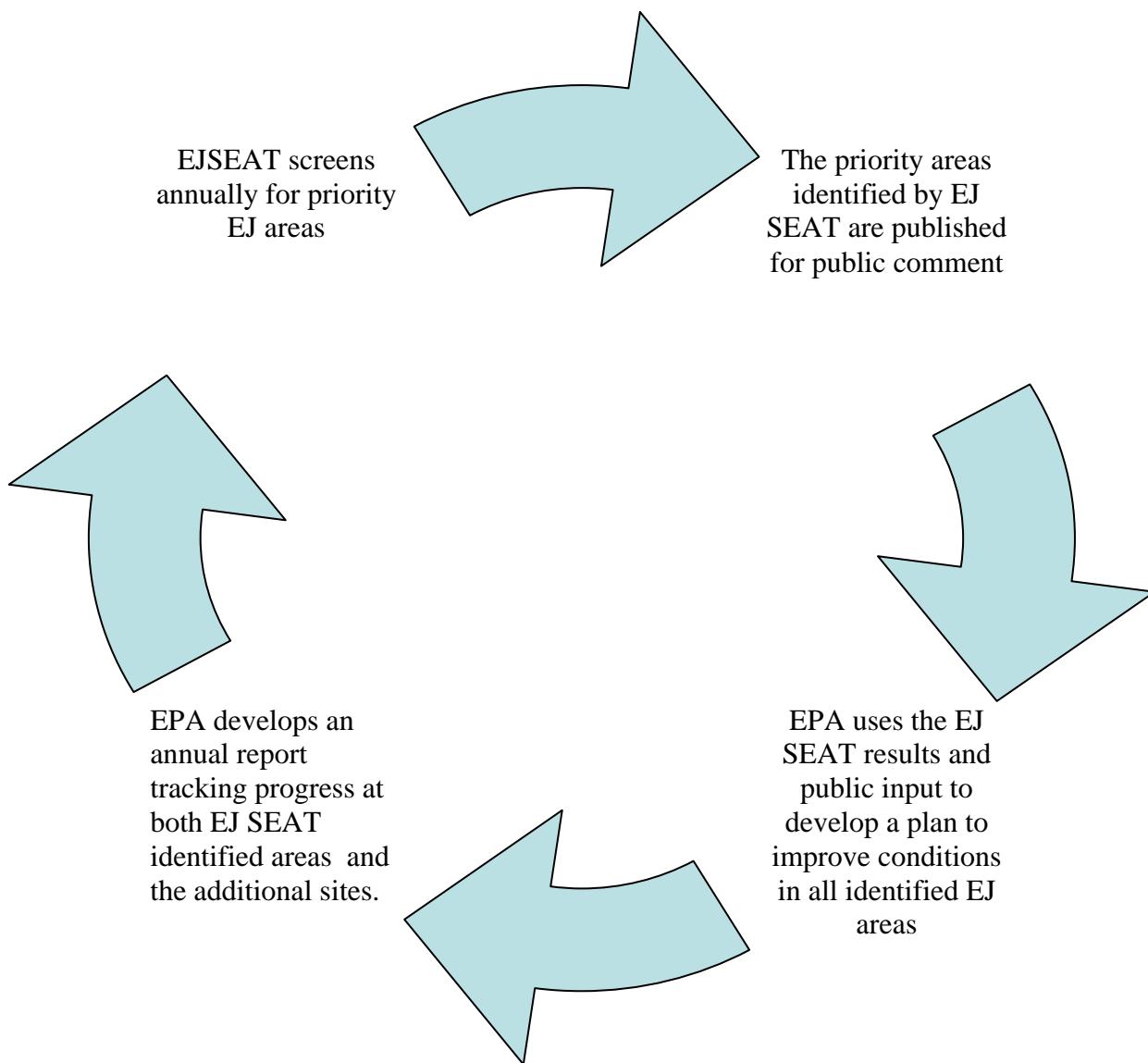
CONCLUSIONS

The review of the NEJAC has led the Council to equally important conclusions about the applications of EJSEAT:

(1) Use of the tool should be carefully delineated:

- Generally, EJSEAT can be useful as part of retrospective evaluations of whether a particular EPA program has been effective in improving environmental justice. Region V, for example, has used the tool to characterize whether its inspection pattern has sufficiently covered environmental justice areas, whether its case settlement policies are sufficiently robust in environmental justice areas, whether pollution prevention efforts have focused on environmental justice areas, and whether environmental benefits received (small grants, etc.) have sufficiently been focused on environmental justice areas.

- In contrast, where EJSEAT is used prospectively, it must be part of a community specific (although consistently employed) process to identify areas not captured by the elements of EJSEAT. The NEJAC does not know whether EPA plans to use EJSEAT to create a list of the high priority areas for which environmental justice may be an important issue (for purposes of targeting enforcement efforts, grant opportunities, or otherwise). If that is the case, however, it will be important that the list be administered in a way that is transparent and that compensates for the limits on data available in the national data base. For this reason, NEJAC recommends the following protocol for use of EJSEAT in circumstances in which it will have an impact on current and future allocation of resources:

- In using this public participation model, which should include both public input and review of any available local land use data, it will be particularly important that EPA adequately outreach to potential environmental justice areas impacted by this prioritization, perhaps using the network of Regional environmental justice coordinators to arrange public meetings

EJSEAT screens annually for priority EJ areas

The priority areas identified by EJ SEAT are published for public comment

EPA develops an annual report tracking progress at both EJ SEAT identified areas and the additional sites.

EPA uses the EJ SEAT results and public input to develop a plan to improve conditions in all identified EJ areas

and other means to solicit comment.

(2) EPA communications describing EJSEAT must be very clear:

All communications about the tool must be very clear that:

- EJSEAT is a consistent, data-based screening tool, but is only a coarse screen, not a conclusion that any particular community is or is not an environmental justice community. It should be made clear at all times that EJSEAT is a screening tool, not an assessment tool, and that further analysis may be necessary.
- EJSEAT includes features tracked in a national database, but does not capture many burdens that must be part of an environmental justice analysis and response, particularly on a regional or local area, as well as in rural areas.
- EJSEAT is largely air focused and will not adequately capture concerns about surface and ground water; soil and land contamination; nuisances like noise, traffic and odor; and non-point sources like pesticide drift and transit corridor emissions.
- EJSEAT is a coarse screening tool only – it can flag areas for attention, but communities must have the opportunity to comment upon an EJSEAT score where they believe an environmental justice community has not been identified by the scoring process. If the particular application does not require national consistency, the community should have the opportunity to supplement the analysis with reliable data, such as land use patterns, from a regional or local database. Similarly, communities believed falsely identified by EJSEAT (for example, industrial zones with virtually no residents) should have the opportunity to make their views known to EPA. However, in general we expect that agency resources will be devoted to environmental justice areas, and these resources should be welcomed by community members. EPA should create a training program for those using EJSEAT, whether in EPA or throughout the states and tribal territories, to assure that its contents (and what it does not capture) are understood and its uses are appropriate.

Communications must be equally clear on what EJSEAT is not:

- The NEJAC recommends in the strongest possible terms that EJSEAT cannot be used in an exclusionary manner. Failure to be prioritized in EJSEAT does not indicate a community should not be treated as an environmental justice community, and this fact must be communicated clearly to all potential users of the tool. Possible misuse is particularly troubling because many of the environmental justice communities not ranked thus by EJSEAT are in fact those who have suffered neglect the longest. For example, communities not in the national database because they are living with the consequences of historic contamination (pre-dating modern regulatory obligations) will simply fall through the EJSEAT screen at the same time that they will not have the benefit of regular attention by regulatory inspectors.
- Nor should designation as an EJSEAT priority community (if scoring is used to rank) be used arbitrarily to impede community development or otherwise overturn, as opposed to inform, local land use authorities or state or EPA permitting officials. EJSEAT is intended to bring needed additional resources and opportunity to communities with legitimate environmental

justice concerns, and should not be used in a way that creates any stigma for a community identified as a result of its use. EJSEAT must not become a new form of "redlining." At the same time, however, the concern about stigma should not be used to provide a rationale for declining to use a coarse screen method to identify potential areas of concern, or for declining to undertake a more nuanced environmental justice analysis within the regulatory context.

- Moreover, EJSEAT is an analytic tool and not itself a source of regulatory authority, and does not override applicable rules and regulations. EJSEAT merely screens to identify potential areas needing environmental improvement, and the response – as opposed to screening process – must take in all appropriate factors and controlling legal requirements. We also believe that EJSEAT should be used in the context of NEJAC's principles of collaborative problem solving and a bias for action.[13]

- EJSEAT should not be used in a way that thwarts the goals NEJAC set forth in its report on Cumulative Risk. The limits of the national databases used in EJSEAT mean that only some of the vulnerabilities and some of the stressors that compromise the health and welfare of residents of environmental justice areas will be captured. If EPA and state and tribal governments focus resources only on the sources captured within EJSEAT, some highly impacted and vulnerable areas will be unaddressed. As a result, some sources included for regulatory action may argue that activities to reduce pollution and improve community conditions are not being demanded proportionately of all contributors to the existing environmental burdens. These are not circumstances likely to result in problem-solving and concrete progress toward community improvement.

(3) Next steps: During discussions with EPA Headquarters and the Regions, all parties concurred that EJSEAT will remain a work-in-progress as new databases are developed, features of the tool are evaluated in the field, and new opportunities emerge to improve its accuracy and usefulness. EPA is to be commended for seeking the views of the diverse group of stakeholders represented in NEJAC to assist the agency as it formulates and rolls out this tool. This kind of outreach should continue under the auspices of NEJAC or other forums reflecting similarly diverse and knowledgeable stakeholders.

SUMMARY OF KEY RECOMMENDATIONS

A. Technical Recommendations:

For Immediate Implementation
1. Because of the significant problems found for some of the indicators, it is recommended that some indicators be significantly modified or deleted entirely. Recommended for deletion are: a) Facilities Not Inspected, b) Violations, and c) Number of Formal Actions. It is further recommended that a) Rate of Low Birth Weight and b) Rate of Infant Mortality be either combined with the Demographic variables or be deleted. RSEITOT should be significantly modified or deleted. We recommend that the geographically specific air pollution risk estimates from the TRI be used rather than the current RSEITOT variable.

---

[13] See NEJAC, Cumulative Risk.

2.   Organizing the 18 indicators into four components, with varying numbers of indicators in each component, results in giving some indicators more weight than others. The four components (Compliance, Environment, Demographic, and Health) could be logically and more usefully collapsed into two: Environmental Impacts and Social Vulnerability. Facility Density should be included in the "Environment" category, thus eliminating "Compliance" as a separate component (after also deleting Facilities Not Inspected, Violations, and Formal Actions, as recommended above). Infant mortality and low birth weight should either be added to the social vulnerability component, or deleted altogether, eliminating "Health" as a separate component.

3.   EPA should reexamine the age variables. There is overall agreement that the under age 5 variable should be retained. In terms of the over age 64 variable, the EPA may omit the variable altogether, may combine it with the under age 5 variable so as not to overweight age generally, or may retain both age variables separately.

4.   The EPA should perform a sensitivity analysis on each variable to determine the degree to which that variable may influence EJSEAT scores and the pattern of those scores.

5.   The current method of normalizing in EJSEAT should be replaced by z-scoring (subtracting the mean and dividing by the standard deviation of the indicator's values). This method better differentiates census tracts.

6.   EPA should make geographic maps of EJSEAT for each state and post these on its website in order to make EJSEAT accessible to everyone. Individuals and groups can then identify tracts/geographic areas that were either overlooked by EJSEAT or require additional information, and bring this to the EPA's attention.

Longer-Range Goals

7.   EJSEAT currently uses environmental indicators that are focused mostly on air pollution. Data pertaining to soil contamination; surface and ground water contamination; nuisances like noise, traffic and odor; and non-point sources like pesticide drift and transit corridor emissions and other environmental factors ought to be also considered.

8.   Additional indicators of Social Vulnerability could be considered, e.g., per capita or median household incomes, percentage of home ownership, percentage unemployed, percentage of female-headed households, presence of schools, etc. However, thought must be given to the proper weighting of these indicators within the Social Vulnerability Category in order to avoid diluting variables with greater reliability.

9.   It should be noted that the spatial distribution of Native American people within the U.S. may be problematic within the methodology of EJSEAT. Statistically speaking, tribal nations rarely show up on national databases, particularly with regard to whether facilities identified in the EPA database are on tribal land or within a tribal buffer zone. EPA's American Indian Environment Office has been tasked with creating an environmental baseline assessment of

Indian Country, but the data are largely protected against outside users, and do not include information created by tribal governments that would be material to the kind of evaluation envisioned by EJSEAT. Of particular concern to any characterization of risk in communities with potential environmental justice concerns is the fact that there are many pan-Indian communities in large cities, where enrolled tribal members live outside the tribal jurisdiction yet will have vulnerabilities that should be understood in an EJSEAT analysis. These issues are described in detail in Appendix E. Given these important and complex issues, we recommend that EPA consult with Native American representatives to develop mechanisms to assure appropriate treatment within the context of the policy, permitting, enforcement, and other decisions the use of EJSEAT will affect.

10.   EJSEAT ought to allow local groups to add additional data to EJSEAT for applications that may not call for nationally consistent methodologies. Specifically, EPA should consider including a component in EJSEAT designated to community concerns.

11.   Because of the normalizing methods used in EJSEAT, scores cannot be compared across states and tribal territories and across time. As a result EJSEAT in its current form cannot be used to assess progress. Additional methods should be developed, or EJSEAT modified, so that comparisons can be made across place and time.

12.   EPA ought to obtain better data on other health indicators associated with environmental exposures such as incidence of cancer, lead poisoning, asthma and other respiratory diseases. The EPA should attempt to obtain these data at the census tract level so that the data can be incorporated into EJSEAT in a methodologically consistent manner.

B. Policy Recommendations

13. Questions were raised about how the agency will use this methodology in general and how it will deal with false positives (i.e. EJSEAT giving high scores to census tracts where environmental justice problems do not exist) and false negatives (i.e., EJSEAT giving low scores to tracts where environmental justice issues are in fact present) in particular. There is special concern regarding false negatives, i.e., that EJSEAT will be used to justify inaction in communities with environmental justice issues. EPA needs to be explicit about how such problems will be avoided. In addition, there may be a tendency by people both inside and outside the EPA to focus on the quantitative aspects of EJSEAT and take the scoring too literally. A training program on the appropriate use of EJSEAT may help to avoid this. The outreach and training regarding EJSEAT might include:

    a. Demonstration projects - as part of the implementation of EJSEAT, pilot projects should be established
    b. Dissemination of info - brochures, webinars, website
    c. Evaluation process - projects that use EJSEAT should be monitored and results evaluated
    d. Training sessions - both inside and outside of the EPA

14. There is currently a lack of clarity about how EJSEAT will be used. EPA should consider widely the possible uses that can be made of EJSEAT. Demonstration projects should be developed and disseminated to the public. Public participation and stakeholder input should be solicited to help further develop EJSEAT's potential for helping affected areas.

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDICES

APPENDIX A

CHARGE ON NATIONALLY CONSISTENT EJ SCREENING APPROACHES

GOAL

The U.S. Environmental Protection Agency seeks to integrate environmental justice (EJ) considerations in all Agency programs, policies, and activities to ensure environmental protection and public health for all people, particularly populations disproportionately burdened by environmental harms and risks. The Agency has determined that a nationally consistent approach to identifying areas with potential environmental justice concerns is necessary to accomplishing such a goal. A coherent and cohesive environmental justice program must be able to provide a consistent national approach in order to develop measures to report on and assess the Agency's actions. In addition, the Agency needs a consistent approach in order to include environmental justice considerations when setting its priorities.

BACKGROUND

In 2003, EPA's Office of Enforcement and Compliance Assurance (OECA) began an effort to develop a consistent methodology that would enable OECA to identify communities experiencing disproportionate environmental and public health burdens for the purposes of enhancing and focusing OECA's enforcement and compliance activities in those areas. OECA's approach involved identifying a set of factors which could indicate disproportionate burdens from environmental harms and risks, are based on nationally consistent and available data, and are consistent with existing environmental and civil rights laws, regulations and enforcement policy.

In 2004, OECA shared this concept with the NEJAC's Enforcement Subcommittee. In addition to recognizing the importance of the concept outlined by OECA, the NEJAC Subcommittee provided feedback on the importance of including health factors in the concept's development into a nationally consistent screening tool. In 2005, Assistant Administrator Grant Nakayama made development of such a tool a national priority for EPA's enforcement and compliance programs. OECA completed a prototype of the Environmental Justice Strategic Enforcement Assessment Tool (EJSEAT) in December, 2007 -- OECA had provided the NEJAC an initial briefing on the latest version of the tool at the Council's Public Meeting on September 18-20, 2007.

Thereafter, the NEJAC sent OECA a letter on December 14, 2007 expressing its desire to provide detailed advice and comments as OECA further deliberates about EJSEAT and other issues of environmental justice integration. After discussion with the Agency's Senior Managers (the Environmental Justice Executive Steering Committee) about further development and proper implementation of EJSEAT, OECA determined that it would be appropriate to first design and conduct a series of field/validation tests of the tool during FY08. OECA intends to design and conduct these tests, taking into consideration the concerns expressed in the NEJAC letter, to evaluate the usefulness and efficacy of the tool and its appropriate applications, in order to identify and address potential barriers and remaining questions about the EJSEAT or its implementation. Questions and comments presented by the NEJAC in its December 14, 2007 letter will be considered in the testing protocol and design. OECA would complete its various field tests of the EJSEAT and have results for deliberation in September of 2008.

Accordingly, in response to comments and direction from the EJ Executive Steering Committee, and to the concerns expressed by the NEJAC and other internal and external stakeholders regarding development of a national approach to identifying environmental justice communities and disproportionately impacted areas, OECA is establishing a NEJAC workgroup to examine issues and questions related to the development of a tool such as EJSEAT and a nationally consistent screening

approach to environmental justice integration. In order to fully identify and develop a set of questions with which to examine this particular tool, and to inform the larger effort of developing a nationally consistent approach to identify, quantify or otherwise measure disproportionate impacts, OECA will need to communicate a charge to the NEJAC that (1) incorporates the results of OECA's testing of the EJSEAT and (2) integrates the concerns expressed during both the development and testing phases of the tool.

WORK GROUP PLAN

OECA proposes a two-phased plan for the NEJAC's "Nationally Consistent EJ Screening Approaches" work group. In Phase 1, the work group will gain a common understanding of EJSEAT and other screening approaches familiar to work group members. With that initial background, the work group will provide "high level" policy advice about the factors and concerns EPA should understand as it develops a nationally consistent screening tool. In Phase 2, the work group will provide more specific advice about EJSEAT itself, as well as a work plan for EPA as it contemplates releasing EJSEAT for use.

Phase One:

Purpose:
- Provide background to the NEJAC on the development of EJSEAT, OECA's approach to testing the tool, and other screening approaches with which work group members are familiar.
- Provide background to the NEJAC on EPA's goal(s) for the development of a nationally consistent approach to identifying areas with potential environmental justice concerns.
- Identify general, policy-level issues, concerns, and potential benefits surrounding EPA's objective(s) to develop and implement a nationally consistent approach to identifying areas with potential environmental justice concerns, and identify actions which should be taken to address these concerns.

Questions Presented:
- What is the level of awareness and understanding of EPA's environmental justice integration goals among its stakeholders, particularly the Agency's stated objective of developing a nationally consistent approach to identifying areas with potential environmental justice concerns? How can EPA increase awareness and understanding of these goals among its stakeholders?
- What are other efforts to produce a consistent approach to identify, quantify, or otherwise measure disproportionate environmental or public health impacts on particular population groups that may be relevant to EPA's efforts to develop a nationally consistent approach for identifying environmental justice communities or areas with potential environmental justice concerns? What lessons can be gained from these efforts?
- What are some important stakeholder issues that EPA should be aware of as the Agency seeks to develop and implement a nationally consistent approach to identifying areas with potential environmental justice concerns? What are some ways to address these issues?
- What characteristics or qualities are important to evaluating the viability of a nationally consistent approach to identifying areas with potential environmental justice concerns?

Phase Two:

Purpose:
- Provide recommendations about the utility of EJSEAT based on the test results from OECA's testing phase and address the goals EPA set out to achieve.
Provide recommendations about how EPA/OECA should move forward with the development and implementation of EJSEAT. and its appendix. Also EPA's letter of response to the NEJAC.

APPENDIX B

NATIONAL ENVIRONMENTAL JUSTICE ADVISORY COUNCIL

♣EPA

Members:
Richard Moore, Chair
Sue Briggum
Chuck Barlow
M. Kathryn Brown
Jolene Catron
William Harper
Jodena Henneke
Christian Holmes
Joyce King
Langdon Marsh
Greg Melanson
Paul Mohai
Shankar Prasad
John Ridgway
John Rosenthal
Patricia Salkin
Donele Wilkins
Omega Wilson
ElizabethYeampierre

December 14, 2007

Mr. Granta Y. Nakayama
Assistant Administrator for Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW (MC2201A)
Washington, D.C. 20460

Dear Mr. Nakayama:

The National Environmental Justice Advisory Council (NEJAC) appreciated receiving an initial briefing about the "Environmental Justice Strategic Enforcement Assessment Tool" (EJ SEAT) at our Council meeting on September 18–20, 2007. Your work to develop an approach to identifying environmental justice communities represents an important effort to provide a uniform process to further environmental justice in EPA's enforcement program. We realize that EJ SEAT is in its final phase of development and testing for quality assurance, accuracy and precision. We encourage EPA to continue seeking technical advice to improve the tool's efficacy, accuracy, and precision. It is notable that the Office of Enforcement and Compliance Assurance (OECA) has requested stakeholder advice about this aspect of its enforcement program, and that this spirit of openness occurs in consideration of the vital issue of enhancing environmental justice.

To assist OECA's development of this tool, we will form a Work Group to provide detailed advice and comments as internal deliberations about EJ SEAT and other issues of environmental justice program integration continue.

We intend to provide candid and thoughtful advice about the crafting and use of EJ SEAT. In particular, we will articulate our thoughts with regard to:

- The need to describe clearly the intended use of the tool;
- The considerations that must be anticipated to assure the tool does not have unintended adverse consequences (e.g., potential use of the tool in a manner that encourages misrepresentation of community impacts, or limits rather than enhancing the resources allocated to assuring environmental justice);
- Sources of expertise who can provide technical review of this data-intensive and complex tool;
- The appropriateness and the methodology for including various factors in the tool, the adequacy of the data inputs to the tool, and potential interaction among those factors;
- Means to assure that tribal issues are adequately covered in EPA's

- enforcement initiatives and the efforts by the American Indian Environmental Office are integrated with other enforcement activities; and
- Use of the tool in a manner consistent with NEJAC's strong support for "bias for action.[1]"

We have attached an Appendix to this letter briefly listing questions and issues that need to be considered as OECA moves forward in refining the EJ SEAT. These emerged from individual NEJAC members during our initial discussion of EJ SEAT. This is not offered as our consensus recommendations on the tool – that awaits further study and discussion – but instead is offered to express our interest in advancing this effort and reflect the breadth of our perspectives in approaching this topic.

Again, we appreciate EPA's and OECA's willingness to work with the NEJAC. Our September meeting was notable in highlighting a number of important and developing EJ activities at both EPA Headquarters and the Regions. The obvious commitment, substance and enthusiasm demonstrated by the Deputy Assistant Administrators and Deputy Regional Administrators in showcasing their efforts to advance environmental justice was commendable. We will continue our support for EPA's efforts to achieve our mutual goal of accelerating the programmatic integration of environmental justice.

Sincerely,

Richard Moore
Chair

cc: NEJAC Members
Charles Lee, Acting Director, OEJ
Victoria Robinson, NEJAC Program Manager, OEJ

---

[1] Ensuring Risk Reduction in Communities with Multiple Stressors: Environmental Justice and Cumulative Risks/Impacts [December 2004], pages 16 and 44

APPENDIX

Questions Raised by Individual NEJAC Members in the Initial Discussion of EJ SEAT

- How will this be used? Will it be limited to informing EPA's internal enforcement discussions to assure that environmental justice communities receive adequate attention, or will there be additional uses? If it is appropriate in only limited uses, how can inappropriate use of the tool be avoided?
- Should this tool be public, both in terms of availability of the tool to be used by others (states, local government, businesses, communities) and availability of the rankings generated by EPA when it employs the tool?
- How will potential negative impacts be avoided (e.g., use of the tool for red-lining by insurers or financiers; use of the tool to exclude from EJ dialogue communities that "fall out" of the characterization of EJ community that are inherent in a tool that defines EJ by distance)?
- What kind of additional peer review would be optimal, and how can it be conducted in order to be helpful and at the same time avoid delay? NEJAC members can be important resources to identify experts familiar with analysis of complex data sets and with the kinds and sources of information important to community members.
- How resource intensive (and expensive) will it be to use the tool?
- How will this tool intersect with state and EPA regional initiatives that already have employ their own tools?
- Given the disjunct between information employed in EJ SEAT and that available for tribal lands, how will the purposes of enhancing enforcement be accomplished for tribes and their communities? Data are particularly lacking with regard to census and health, and these shortcomings must be overcome. We understand that EPA's American Indian Environmental Office may be working on a comparable effort to provide information on environmental impacts in tribal communities, and integration of those efforts will be important.
- Are there other populations inadequately addressed by EJ SEAT (e.g., migrant workers)?
- Are the factors listed adequate, is sufficient information available for each, and how does availability of information/importance of a factor influence the proposed scoring method? How can the system compensate for missing or potentially misleading data?
- Should the scoring be a single target or range?
- If the tool is used to show accomplishment in EJ enforcement, how will the limitations in a uniform method be addressed (e.g., is it more important to address the largest number of impacted people, or those most adversely impacted?)?
- How can the nature and use of EJ SEAT be communicated such that it is more transparent than assessment tools used by EPA that historically have been criticized as "black boxes" (e.g., risk assessments)?
- How can EJ SEAT be communicated such that its relative use, in the context of other useful EJ tools, can be appreciated? How can the limits on using EJ SEAT be effectively communicated?
- Since this is intended as an enforcement tool, how will it work within EPA's authorities delegated to the states?

APPENDIX C

FEB 4 2008

Mr. Richard Moore
Chair
National Environmental Justice Advisory Council
c/o Southwest Network for Environmental and
  Economic Justice
804 Park Avenue, SW
Albuquerque, New Mexico 87102

Dear Mr. Moore:

On behalf of the Office of Enforcement and Compliance Assurance, I want to express our appreciation for your letter of December 14, 2007, regarding the National Environmental Justice Advisory Council's (NEJAC) interest in the Environmental Justice Strategic Enforcement Assessment Tool (EJSEAT or "Tool"). We appreciate your interest in advancing our efforts to develop a consistent approach to identify potential areas of environmental justice concern. We also appreciate your desire to be a partner to OECA by providing advice and recommendations to improve the Tool's comprehensiveness, efficacy and accuracy. We welcome your desire to establish a workgroup to facilitate the development of such advice and recommendations.

Based upon our discussions with the NEJAC and others, OECA is currently evaluating approaches to testing the Tool to gain practical experience regarding its use. OECA will be working with EPA's Regional and Headquarters offices to design and conduct these tests during the remainder of the 2008 fiscal year. We consider NEJAC to be an important source of expertise as we embark upon this process, and will seek your input as we move forward. To facilitate your ability to provide advice and recommendations, the Office of Environmental Justice will convene a NEJAC EJSEAT workgroup this spring.

As you know, I have been a strong advocate of the principle of meaningful involvement and we look forward to your continued input on this important project.

Sincerely,

Granta Y. Nakayama

Granta Y. Nakayama

cc: NEJAC Members
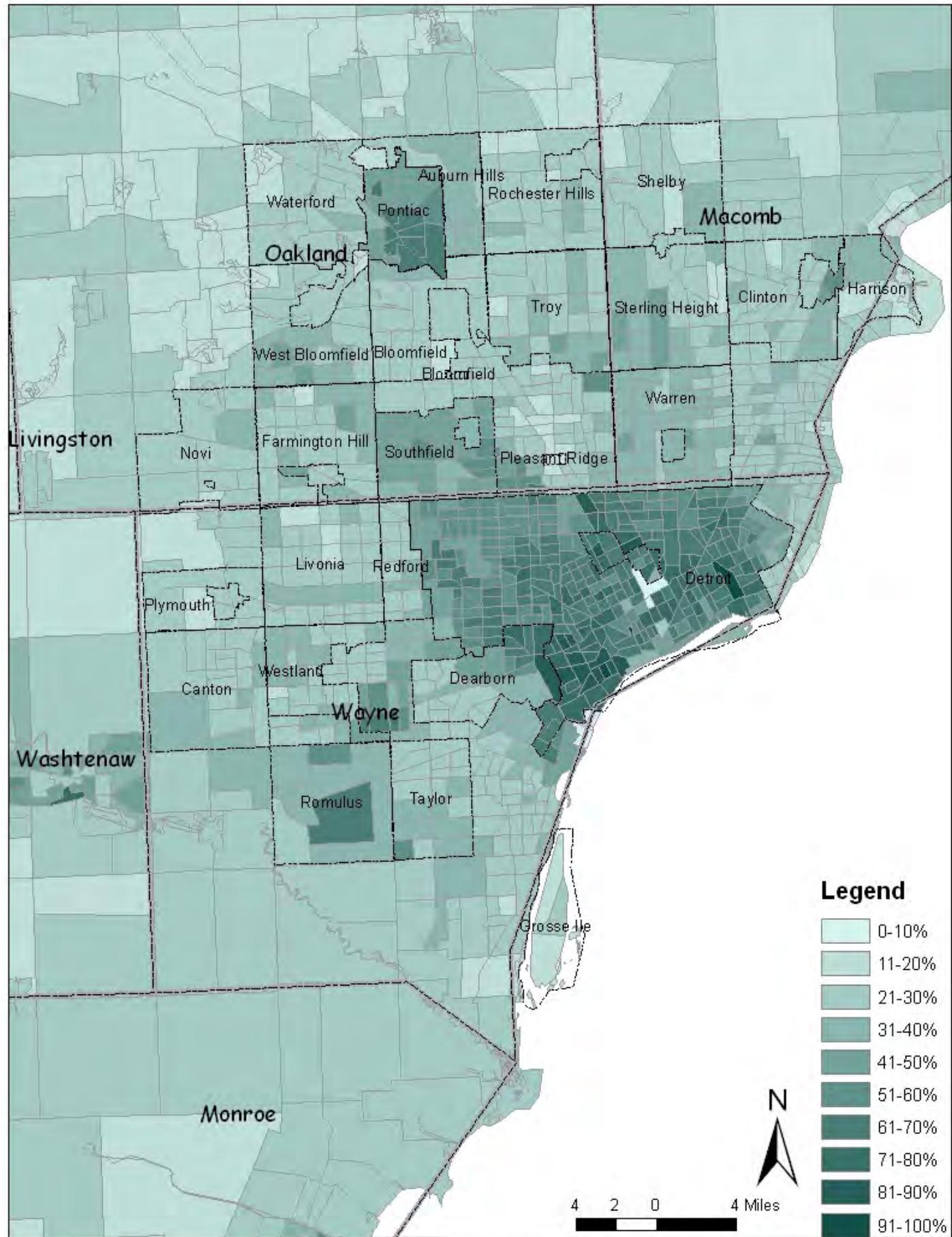
APPENDIX D

Z-Scores
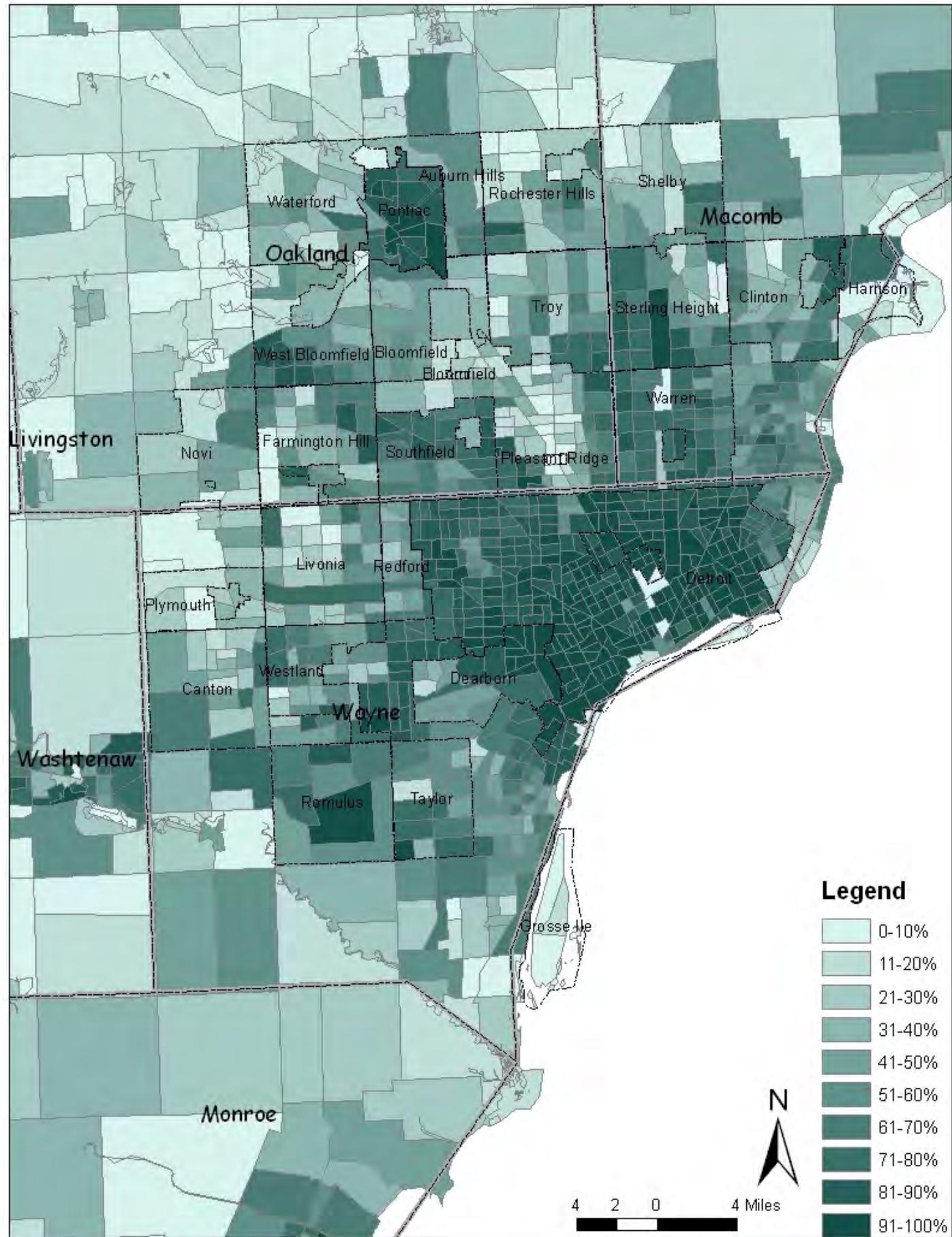
Wikipedia:

In statistics, a **standard or z-score** is a dimensionless quantity derived by subtracting the mean from an individual raw score and then dividing the difference by the standard deviation. This conversion process is called **standardizing** or **normalizing**. The z-score indicates how many standard deviations an observation is above or below the mean.

EJSEAT (Demographic): SS_DEM

Legend

- 0-10%
- 11-20%
- 21-30%
- 31-40%
- 41-50%
- 51-60%
- 61-70%
- 71-80%
- 81-90%
- 91-100%

N

4 2 0   4 Miles

Percentiles of Averaged Z Scores of Demographic

Legend

	0-10%
	11-20%
	21-30%
	31-40%
	41-50%
	51-60%
	61-70%
	71-80%
	81-90%
	91-100%

Livingston

Oakland

Waterford

Pontiac

Auburn Hills

Rochester Hills

Shelby

Macomb

Clinton

Harrison

Troy

Sterling Height

West Bloomfield

Bloomfield

Bloomfield

Warren

Novi

Farmington Hill

Southfield

Pleasant Ridge

Livonia

Redford

Detroit

Plymouth

Westland

Dearborn

Canton

Wayne

Washtenaw

Romulus

Taylor

Grosse Ile

Monroe

N

4 2 0   4 Miles

EJSEAT (Environment): SS_ENV

Legend

	0-10%
	11-20%
	21-30%
	31-40%
	41-50%
	51-60%
	61-70%
	71-80%
	81-90%
	91-100%

4 2 0 4 Miles

N

Percentiles of Averaged Z Scores of Environment

Legend

	0-10%
	11-20%
	21-30%
	31-40%
	41-50%
	51-60%
	61-70%
	71-80%
	81-90%
	91-100%

EJSEAT Percentile (Scaled): EJSEATPCT

Legend

	0-10%
	11-20%
	21-30%
	31-40%
	41-50%
	51-60%
	61-70%
	71-80%
	81-90%
	91-100%

Percentiles of the Average of the Z Scores of the 18 Variables

Legend

	0-10%
	11-20%
	21-30%
	31-40%
	41-50%
	51-60%
	61-70%
	71-80%
	81-90%
	91-100%

N

2 1 0   2 Miles

EJSEAT (Demographic): SS_DEM

Legend

- 0-10%
- 11-20%
- 21-30%
- 31-40%
- 41-50%
- 51-60%
- 61-70%
- 71-80%
- 81-90%
- 91-100%

N

8 4 0   8 Miles

Percentiles of Averaged Z Scores of Demographic

Legend

	0-10%
	11-20%
	21-30%
	31-40%
	41-50%
	51-60%
	61-70%
	71-80%
	81-90%
	91-100%

8 4 0   8 Miles

N

EJSEAT (Environment): SS_ENV

Legend

	0-10%
	11-20%
	21-30%
	31-40%
	41-50%
	51-60%
	61-70%
	71-80%
	81-90%
	91-100%

8 4 0   8 Miles

Percentiles of Averaged Z Scores of Environment

Clare

Gladwin

Arenac

Huron

Bay

Isabella

Midland

Tuscola

Sanilac

Saginaw

Gratiot

Lapeer

Genesee

St. Clair

Clinton

Shiawassee

Macomb

Oakland

Eaton

Ingham

Livingston

Wayne

Calhoun

Jackson

Washtenaw

Hillsdale

Lenawee

Monroe

N

8 4 0   8 Miles

Legend

	0-10%
	11-20%
	21-30%
	31-40%
	41-50%
	51-60%
	61-70%
	71-80%
	81-90%
	91-100%

EJSEAT Percentile (Scaled): EJSEATPCT

Clare
Gladwin
Arenac
Huron
Isabella
Midland
Bay
Saginaw
Tuscola
Sanilac
Gratiot
Lapeer
Genesee
St. Clair
Ionia
Clinton
Shiawassee
Eaton
Ingham
Livingston
Oakland
Macomb
Calhoun
Jackson
Washtenaw
Wayne
Hillsdale
Lenawee
Monroe

Legend

	0-10%
	11-20%
	21-30%
	31-40%
	41-50%
	51-60%
	61-70%
	71-80%
	81-90%
	91-100%

N

10 5 0   10 Miles

Percentiles of the Average of the Z Scores of the 18 Variables

Legend

- 0-10%
- 11-20%
- 21-30%
- 31-40%
- 41-50%
- 51-60%
- 61-70%
- 71-80%
- 81-90%
- 91-100%

N

10 5 0   10 Miles

Using the RSEI Geographically Specific Microdata (RSEI-GM)
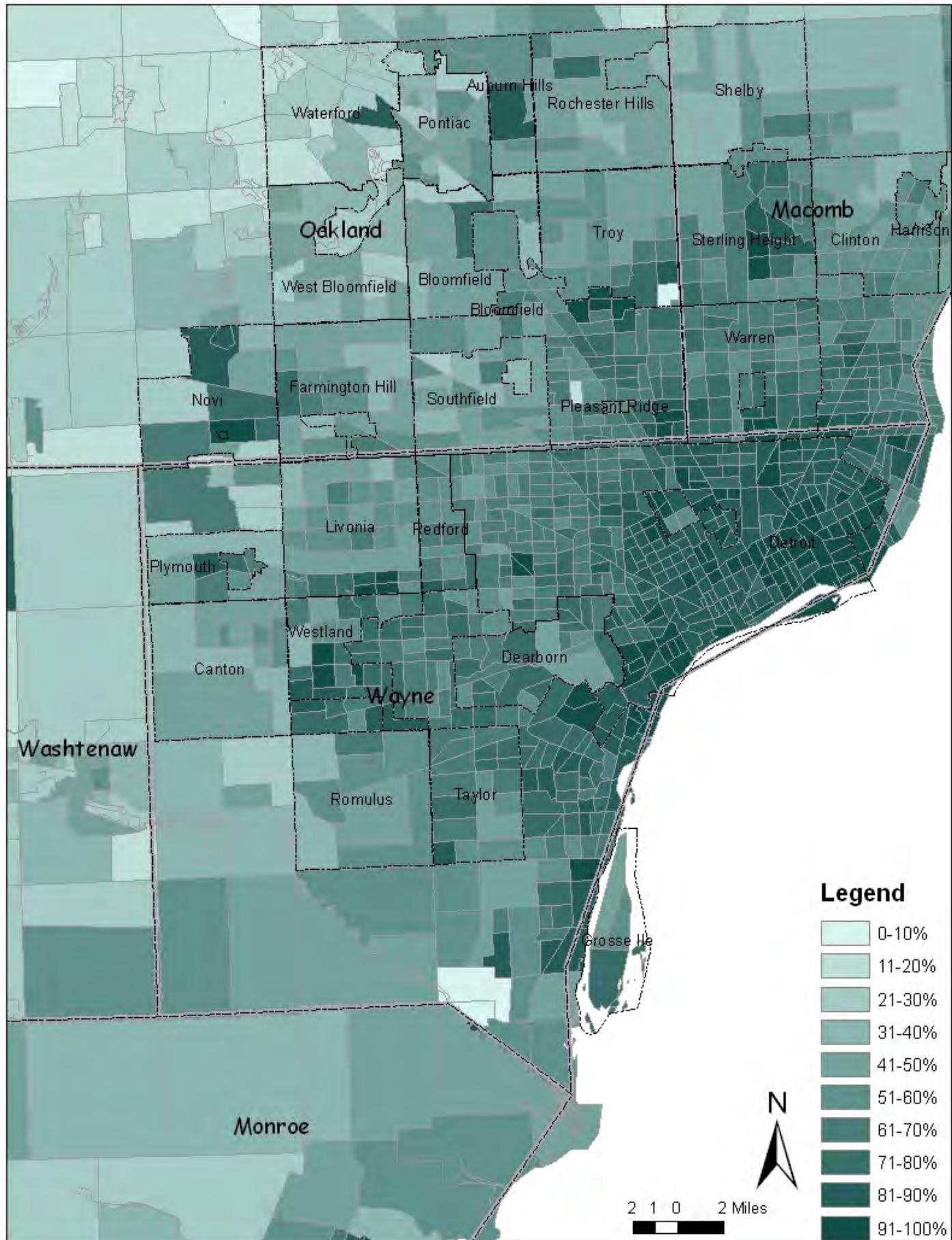
vs.

RSEITOT
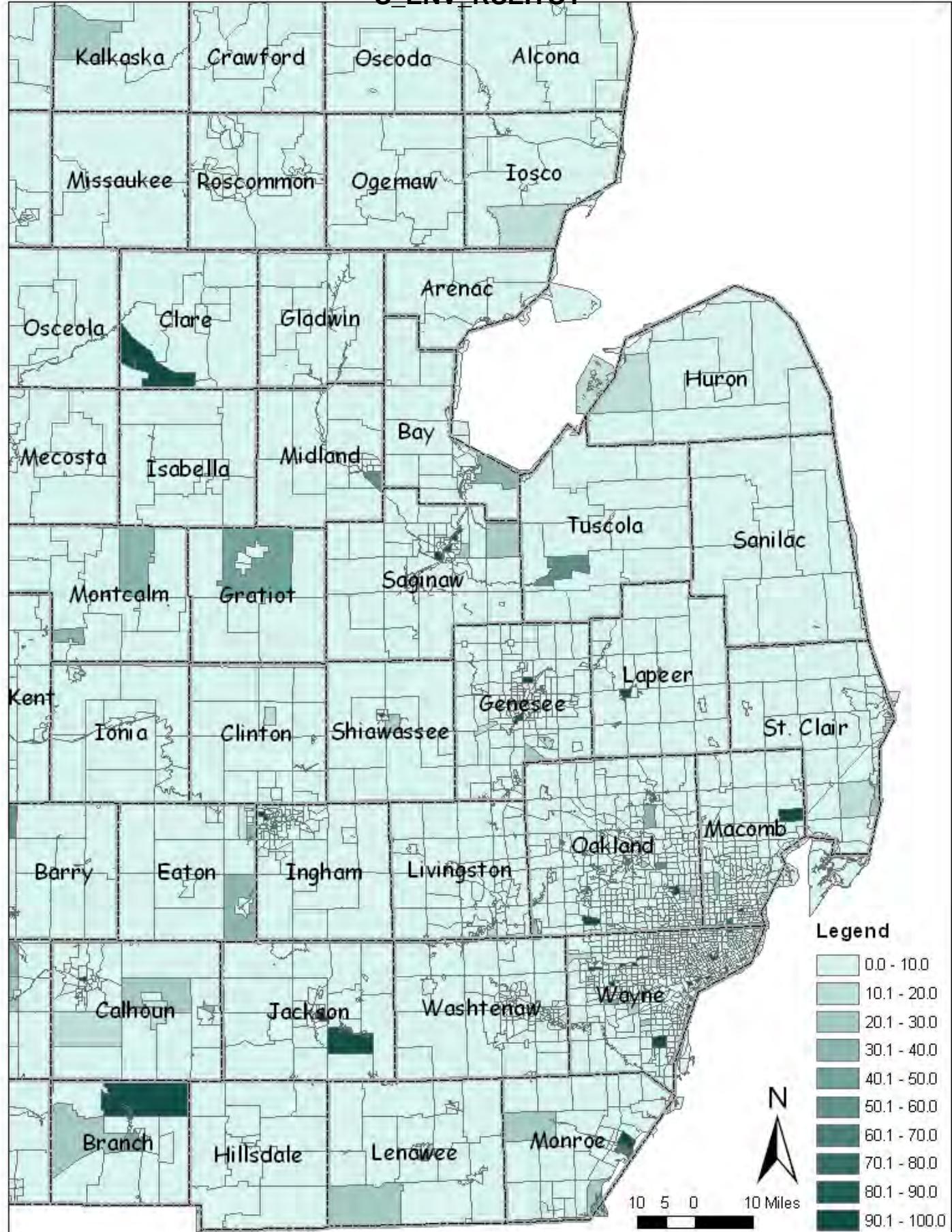
Toxic Chemical Releases and Transfers from Industrial Facilities (Scaled): S_ENV_RSEITOT
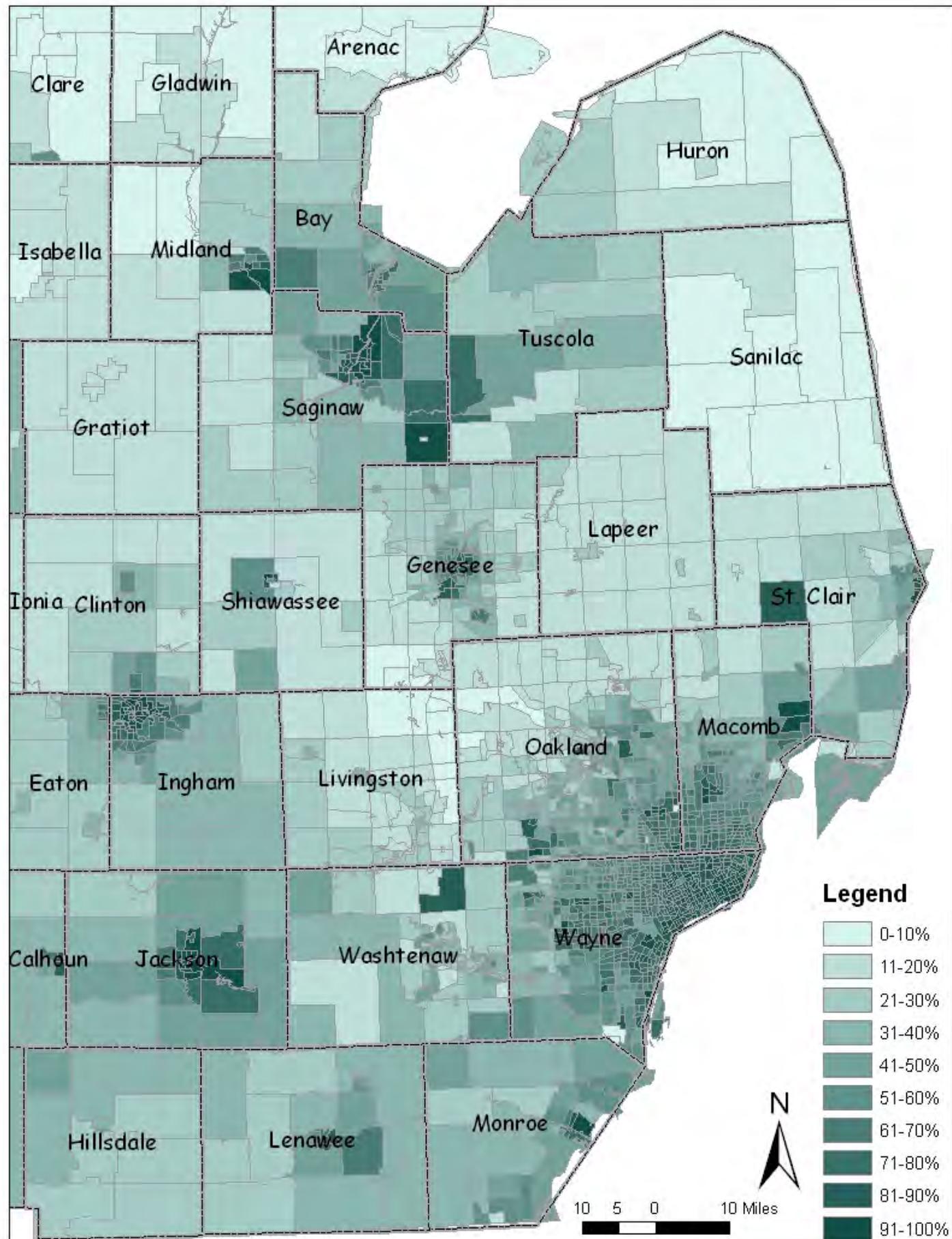
Oakland

Macomb

Wayne

Washtenaw

Monroe

Legend

- 0.0 - 10.0
- 10.1 - 20.0
- 20.1 - 30.0
- 30.1 - 40.0
- 40.1 - 50.0
- 50.1 - 60.0
- 60.1 - 70.0
- 70.1 - 80.0
- 80.1 - 90.0
- 90.1 - 100.0

N

5   2.5   0   5 Miles

Percentiles of the 2000 RSEI-GM Toxic Concentrations

Legend

	0-10%
	11-20%
	21-30%
	31-40%
	41-50%
	51-60%
	61-70%
	71-80%
	81-90%
	91-100%

N

2 1 0   2 Miles

Toxic Chemical Releases and Transfers from Industrial Facilities (Scaled): S_ENV_RSEITOT

Legend

	0.0 - 10.0
	10.1 - 20.0
	20.1 - 30.0
	30.1 - 40.0
	40.1 - 50.0
	50.1 - 60.0
	60.1 - 70.0
	70.1 - 80.0
	80.1 - 90.0
	90.1 - 100.0

10 5 0   10 Miles

Percentiles of the 2000 RSEI-GM Toxic Concentrations

Clare
Gladwin
Arenac
Huron
Bay
Isabella
Midland
Saginaw
Tuscola
Sanilac
Gratiot
Lapeer
Ionia Clinton
Shiawassee
Genesee
St. Clair
Eaton
Ingham
Livingston
Oakland
Macomb
Calhoun
Jackson
Washtenaw
Wayne
N
Hillsdale
Lenawee
Monroe

Legend

	0-10%
	11-20%
	21-30%
	31-40%
	41-50%
	51-60%
	61-70%
	71-80%
	81-90%
	91-100%

10   5   0   10 Miles

APPENDIX E

Tribal Considerations For Screening

The Federal Government's trust responsibility to federally recognized tribes dictates that a level of communication and consultation be established between governments (see Executive Order 13175 - Consultation and Coordination With Indian Tribal Governments). For far too long, tribal communities have felt the disproportionate burden of environmental fallout from industry practices and other environmental actions. And to this day, tribal communities continue to feel this burden. Lack of communication—across data sets, across decision makers and across governments--continues to exacerbate this situation. If EJSEAT is being considered towards a tribal perspective, affected tribes must first be consulted and involved in a meaningful way. Statistically speaking, tribal nations rarely show up on national databases. This is a factor of many issues, not just a reflection of population. For example, regarding infant mortality and low birth rate for a tribal population (for instance, Wind River Indian Reservation), this information is available at the county level. However, specific information regarding breakdown by race or by other demographic consists of researching through another layer of information. As with a lot of demographic information regarding Indians, it takes several more layers of investigating before the actual data surfaces.

Another example is the development of an identification number for a facility listed in an EPA database. These alphanumeric IDs usually identify which state the facility is located only. The identifier does not include any information about its location near to Indian Country. Navajo Nation is advocating change within EPA to develop identifiers that will show whether a facility is on tribal land, or within a tribal buffer zone.

As a coarse screening tool, EJSEAT does not have the sensitivity to accurately reflect data on Indians.The question becomes whether EJSEAT is even the tool needed to assess environmental justice sensitivities on tribal nations. For years, tribal governments, agencies and communities have been surveyed about their environmental issues by a myriad of different federal agencies, universities, etc. Because federally recognized tribes have a government-to-government relationship with the federal government, environmental justice data can be spread across federal agencies, such as the EPA, Department of Interior, Health and Human Services, etc. Each agency has their own set of data, all of which rarely communicate with each other.

EPA's American Indian Environment Office (AIEO) has been tasked with creating an environmental baseline assessment of Indian Country. This became the Tribal Enterprise Architecture. The TEA was developed to assess needs in Indian Country, not necessarily to define environmental justice communities. This TEA data helped EPA assess which Tribes wanted or needed formal environmental protection programs and at what level of assistance. This data is largely protected against outside users who don't have information/password access.
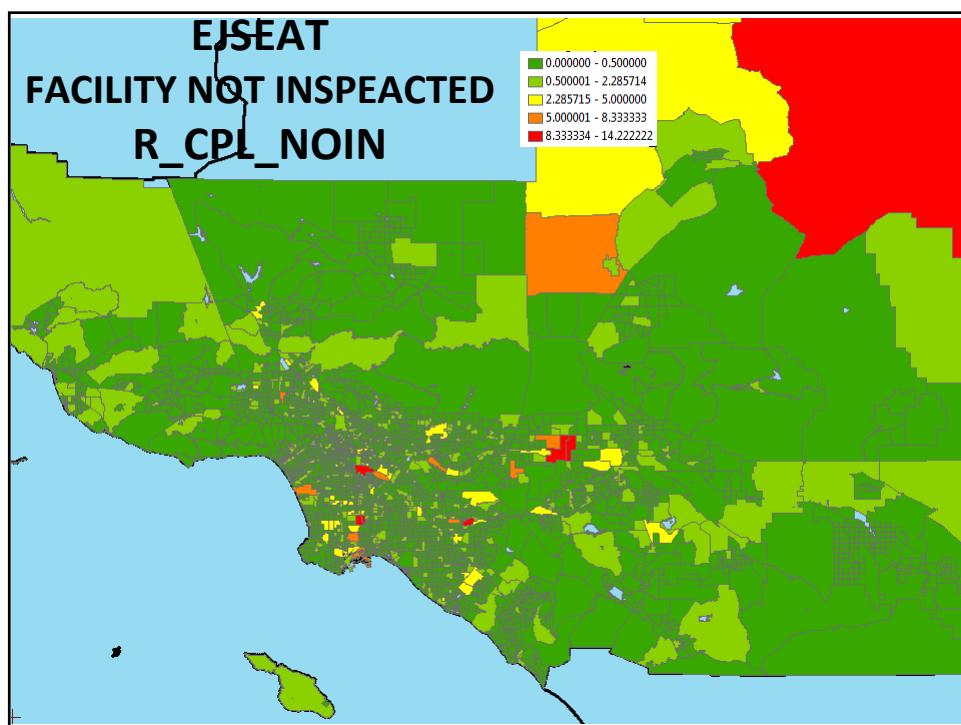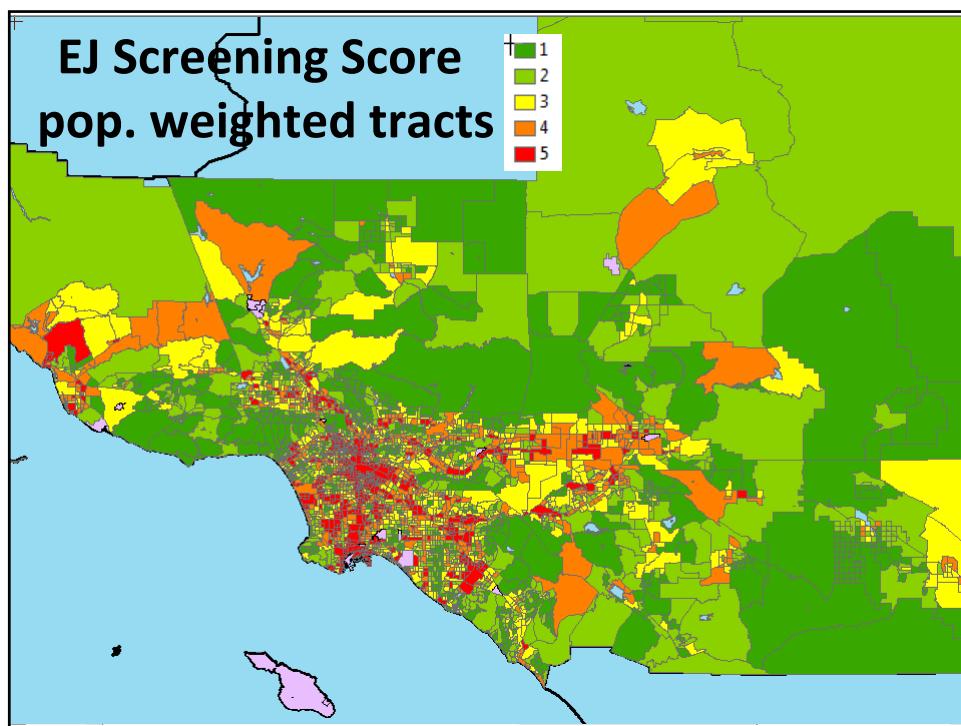
Tribal governments through their own tribal environmental agencies have spent decades developing their own environmental data sets. Often times because of the sensitivity of some data, there is a reluctance from Tribes to openly share all data. This sensitivity comes from possible lawsuits, jurisdictional issues, cultural resource protection (sacred sites), etc. However, a
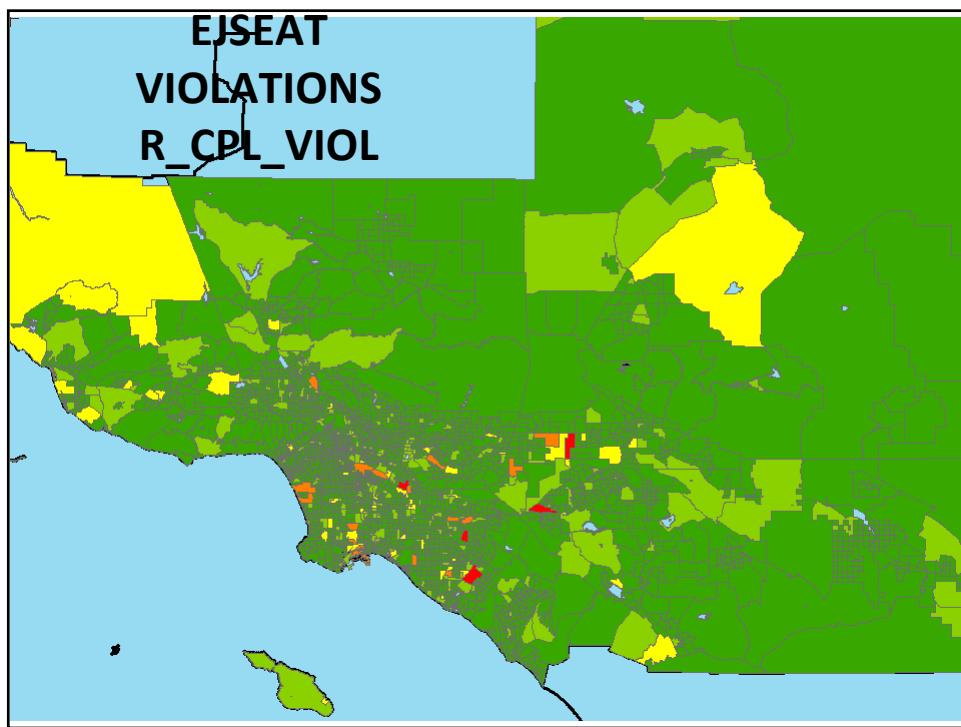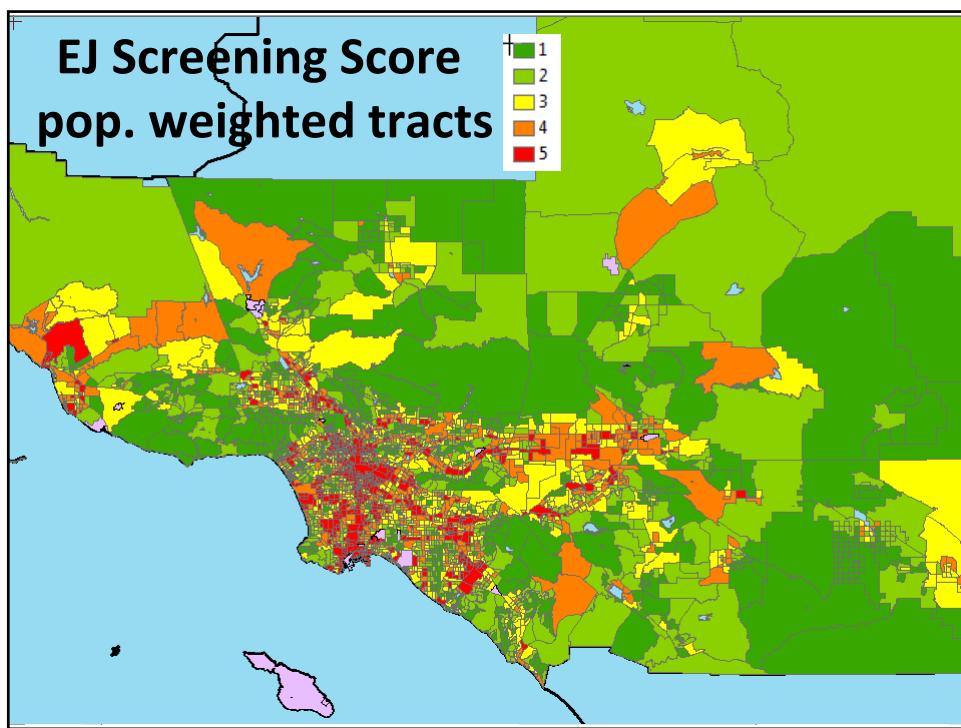
network has been developed through a partnership among states, tribes, and the U.S. Environmental Protection Agency that is revolutionizing the exchange of environmental information, the National Environmental Information Exchange. Partners on the Exchange Network share data efficiently and securely over the Internet.
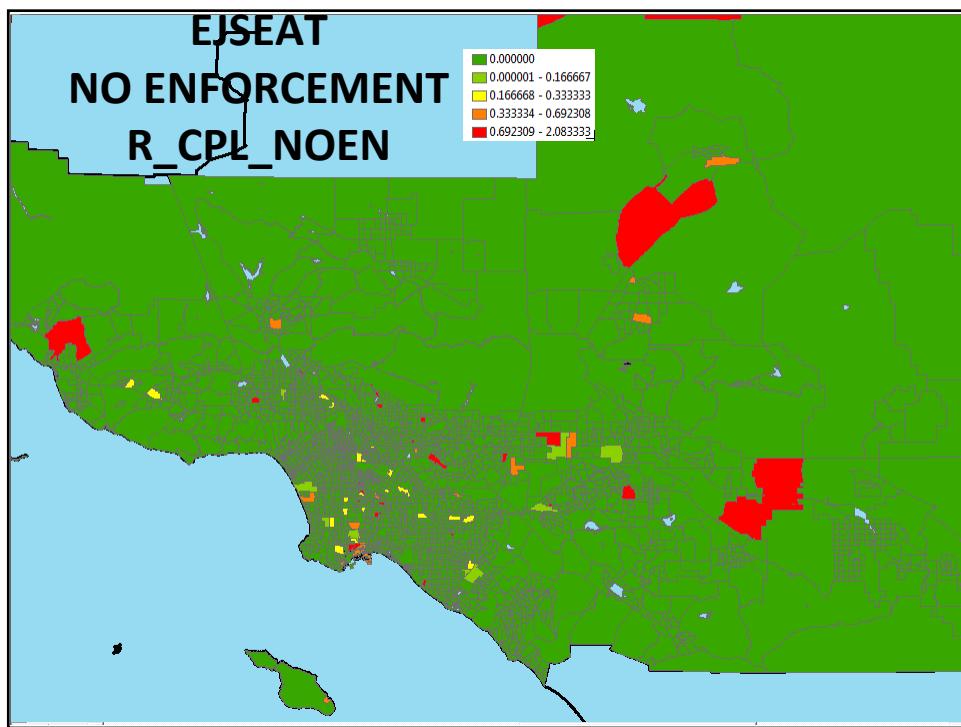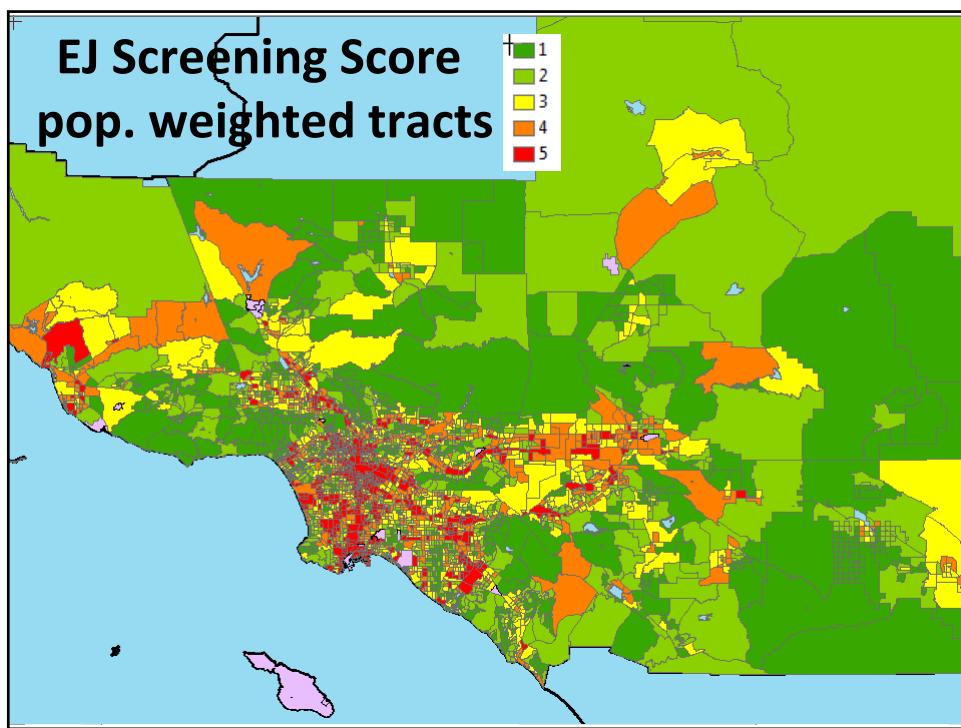
It should also be noted that Indians also reside outside of Indian Country. During the Urban Relocation program of the 1950s and '60s, many Indian people from the reservation were relocated to large metropolitan areas such as Chicago, Denver, Los Angeles, San Francisco, San Jose, St. Louis, Cincinnati, Cleveland and Dallas. Relocatees were not relegated to a certain neighborhood, but because of financial situations, many Indian people ended up locating in low-income, substandard housing. The urban relocation was a federal program, so not just one tribe was involved--all tribes in the US were involved. This created pan-Indian communities in these large cities. Urban Indian centers were often created to support these people, but even though many Indian people are enrolled members of their respective tribes, they live outside the jurisdiction and boundaries of their tribes. Their fate regarding environmental justice is the same as any other person living in an urban area. However, Census data may be helpful in identifying clusters of tribal people who are affected by environmental justice issues.
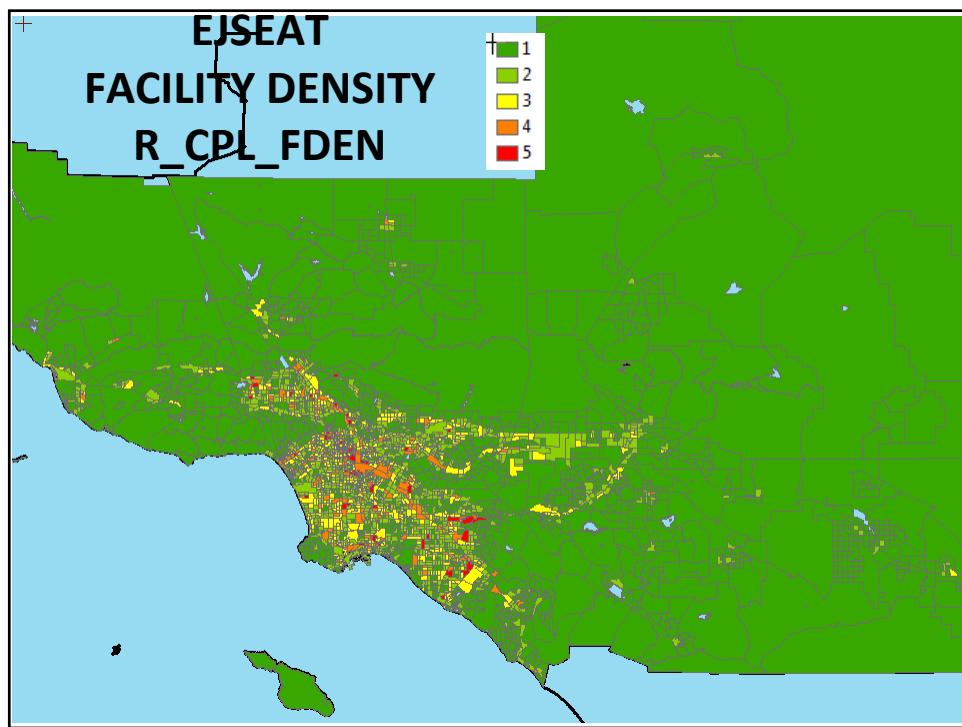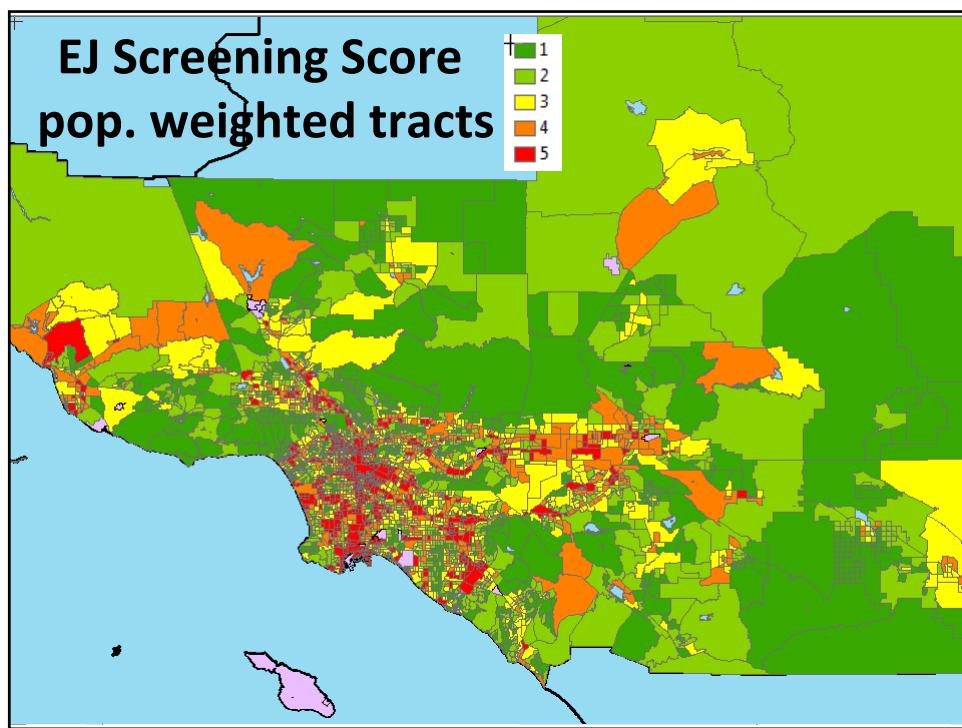
Accurate data exists to assess environmental justice impacts to tribal nations. As such, tribal nations should be the FIRST to be consulted when assessing these impacts. Tribal data should be respected as a reflection of the tribes' sensitivities to environmental protection of their lands, cultural resources and treaty rights. As such, EPA would be affirming Tribes' inherent rights to and management authority over tribal resources, which is in support of EPA's own Indian Policy (EPA recognizes Tribal Governments as sovereign entities with primary authority and responsibility for the reservation populace.)

APPENDIX F

EJ Screening Score
pop. weighted tracts

1
2
3
4
5

EJSEAT
FACILITY NOT INSPEACTED
R_CPL_NOIN

0.000000 - 0.500000
0.500001 - 2.285714
2.285715 - 5.000000
5.000001 - 8.333333
8.333334 - 14.222222

EJ Screening Score
pop. weighted tracts

1
2
3
4
5

EJSEAT
VIOLATIONS
R_CPL_VIOL

EJ Screening Score
pop. weighted tracts

■	1
■	2
■	3
■	4
■	5

EJSEAT
NO ENFORCEMENT
R_CPL_NOEN

■	0.000000
■	0.000001 - 0.166667
■	0.166668 - 0.333333
■	0.333334 - 0.692308
■	0.692309 - 2.083333

EJ Screening Score
pop. weighted tracts

| 1 |
| 2 |
| 3 |
| 4 |
| 5 |

EJSEAT
FACILITY DENSITY
R_CPL_FDEN

| 1 |
| 2 |
| 3 |
| 4 |
| 5 |

EJ Screening Score
pop. weighted tracts

1
2
3
4
5

EJSEAT
% MINORITY
R_DEM_PMNR

EJ Screening Score
pop. weighted tracts

1
2
3
4
5

EJSEAT
NO DIPLOMA
R_DEM_PNODIP

EJ Screening Score
pop. weighted tracts

1
2
3
4
5

EJSEAT
BELOW POVERTY LINE
R_DEM_PLOWINC

EJ Screening Score
pop. weighted tracts

■	1
■	2
■	3
■	4
■	5

EJSEAT
POP UNDER AGE 5
R_DEM_PUND5

EJ Screening Score
pop. weighted tracts

1
2
3
4
5

EJSEAT
POP OVER 64
R_DEM_POVR64

EJ Screening Score
pop. weighted tracts

| 1 |
| 2 |
| 3 |
| 4 |
| 5 |

EJSEAT
LINGUISTIC ISOLATION
R_DEM_PNOE

EJ Screening Score
pop. weighted tracts

1
2
3
4
5

EJSEAT
NATA CANCER RISK
R_ENV_AIRCANC

EJ Screening Score
pop. weighted tracts

1
2
3
4
5

EJSCAT
NATA
NUERO/REPSIRATORY
R_ENV_AIRNEUR

EJ Screening Score
pop. weighted tracts

1
2
3
4
5

EJSEAT
NATA DIESEL NONCANCER
R_ENV_AIRDIES

EJ Screening Score
pop. weighted tracts

1
2
3
4
5

EJSEAT
PM 2.5 CONC
R_ENV_PM25

EJ Screening Score
pop. weighted tracts

1
2
3
4
5

EJSEAT
TRI RISK SCREENING
R_ENV_RSEI

EJ Screening Score
pop. weighted tracts

Legend:
1
2
3
4
5

EJSEAT
8 HOUR OZONE CONC
R_ENV_OZ8H

EJ Screening Score
pop. weighted tracts

1
2
3
4
5

EJSEAT
INFANT MORTALITY
R_HLT_INFM

EJ Screening Score
pop. weighted tracts

1
2
3
4
5

EJSEAT
LOW BIRTHWEIGHT
R_HLT_LOWB

APPENDIX G

Environmental Justice Strategic Enforcement Assessment Tool (EJ SEAT) in New York City

U.S. Environmental Protection Agency National Environmental Justice Advisory Council Atlanta, GA, October 20th, 2008

Juliana Astrud Maantay, Ph.D., M.U.P.

Urban Geographic Information Science (GISc) Lab
Department of Environmental, Geographic, and Geological Sciences
Lehman College, City University of New York, Bronx, NY
and CUNY Graduate Center, Earth and Environmental Sciences Program

OJECTIVE OF THE EJSEAT MAPPING EXERCISE FOR NEW YORK CITY

Three of the technical members of the NEJAC EJ Screening Workgroup were asked by Workgroup chairs to map out the EJSEAT scores for a geographical area that we were very familiar with, (i.e., in my case, New York City) to see if the scores matched up well with our knowledge of "on-the-ground" conditions.

I mapped the EJ SEAT scores for each NYC census tract (2,200+ tracts), as well as several of the individual variables that make up the total scores, in order to determine if, in fact, the scores "looked" about right when examined from a purely visual perspective. If the EJ SEAT scores did not seem to match up with what I knew to be reality, then perhaps by mapping some of the individual variables, we would be able to discern if any particular factor within the score was helping to skew the results.

The following slides show the context of environmental and socio-demographic conditions in NYC, the results of mapping some of the individual factors that comprise the EJ SEAT scores, the mapped EJ SEAT scores by census tracts, some anomalies between the results and reality as I know it, and some concerns about the use of EJ SEAT in New York City.

New York City

NYC boroughs
surrounding areas

Westchester County, NY

The Bronx

New Jersey

Manhattan

Queens

Nassau County, NY

Brooklyn

Staten Island

10 Miles

Locator Map by A.R. Maroko, Urban GISc Lab, City University of New York, Lehman College
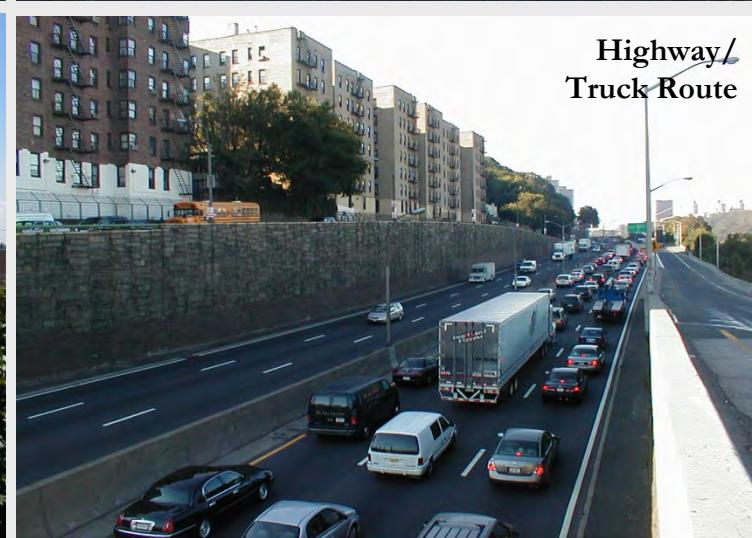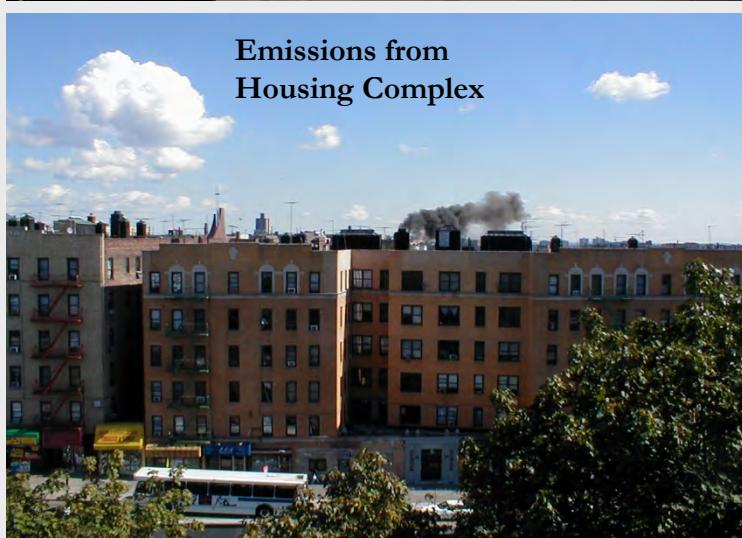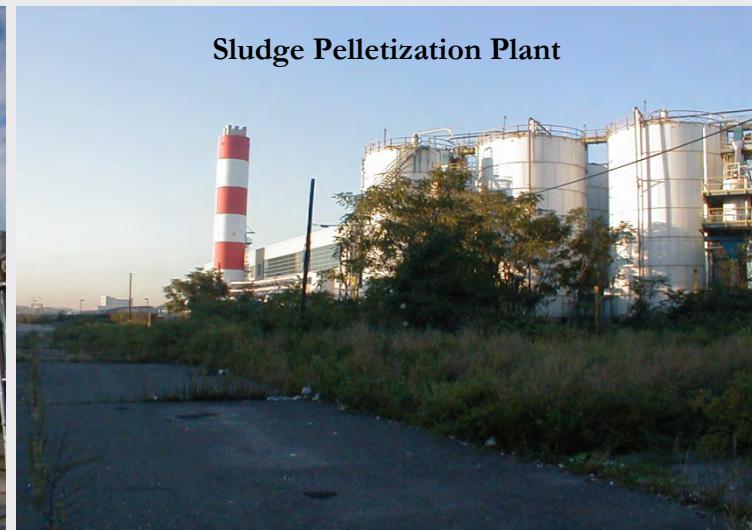
The Context of New York City's Environment

NYC is an island city, with only one of the five boroughs (the Bronx, which is a peninsula) on the mainland of the U.S. There is virtually no freight train service into NYC, for various geographical and political reasons. This means that, in effect, almost all freight is trucked in (mainly through the Bronx) and much of the passenger vehicular traffic also passes through the Bronx to reach the other boroughs and points east on Long Island. Although NYC is well-served by an extensive public transportation network, millions of vehicles each day travel into or through the city.

The Cross Bronx Expressway has the highest volume of vehicles of any highway in the nation. The Bronx, as well as parts of Brooklyn and Queens, also have a high number of TRI facilities and other major stationary point sources of air pollution. And since NYC is so densely settled, even residential complexes, medical institutions, and small emitters cumulatively have a large impact on air quality for proximate residential populations.

Noxious Land Uses in New York City

Toxic Release Inventory (TRI) Facility

Sludge Pelletization Plant

Emissions from
Housing Complex

Highway/
Truck Route

Photos by Juan Carlos Saborio, Lehman College, Urban GISc Lab

Highways of the Bronx – Yesterday's "City of Tomorrow," Today

"This image is a microcosm of conditions in the South Bronx, where communities are enveloped by a dense network of highways, contributing to a labyrinth of pollution that surrounds the residential neighborhoods.

Much of the traffic is not local, but rather contains a high proportion of long-distance trucks, due to the fact that the Bronx in the only borough of New York City located on the mainland, and therefore most freight destined for the rest of the city and points east passes through the Bronx. This transportation scheme results in the Bronx having not only one of the highest vehicular counts on its roadways, but also one of the highest asthma hospitalization rates in the nation.

When this highway system was developed, it was considered by many to be an example of progressive planning. Now, however, it has a stranglehold on the people of the Bronx, many of whom are particularly vulnerable to its effects due to socio-demographic factors and underlying health conditions and health care access issues."

Juliana Maantay, *Urban Geography*, January, 2009,
Caption to Brian Morgan's cover photograph of Bronx highways

Cover of *Urban Geography*, January, 2009. Photo by Brian Morgan, Urban GISc Lab, CUNY
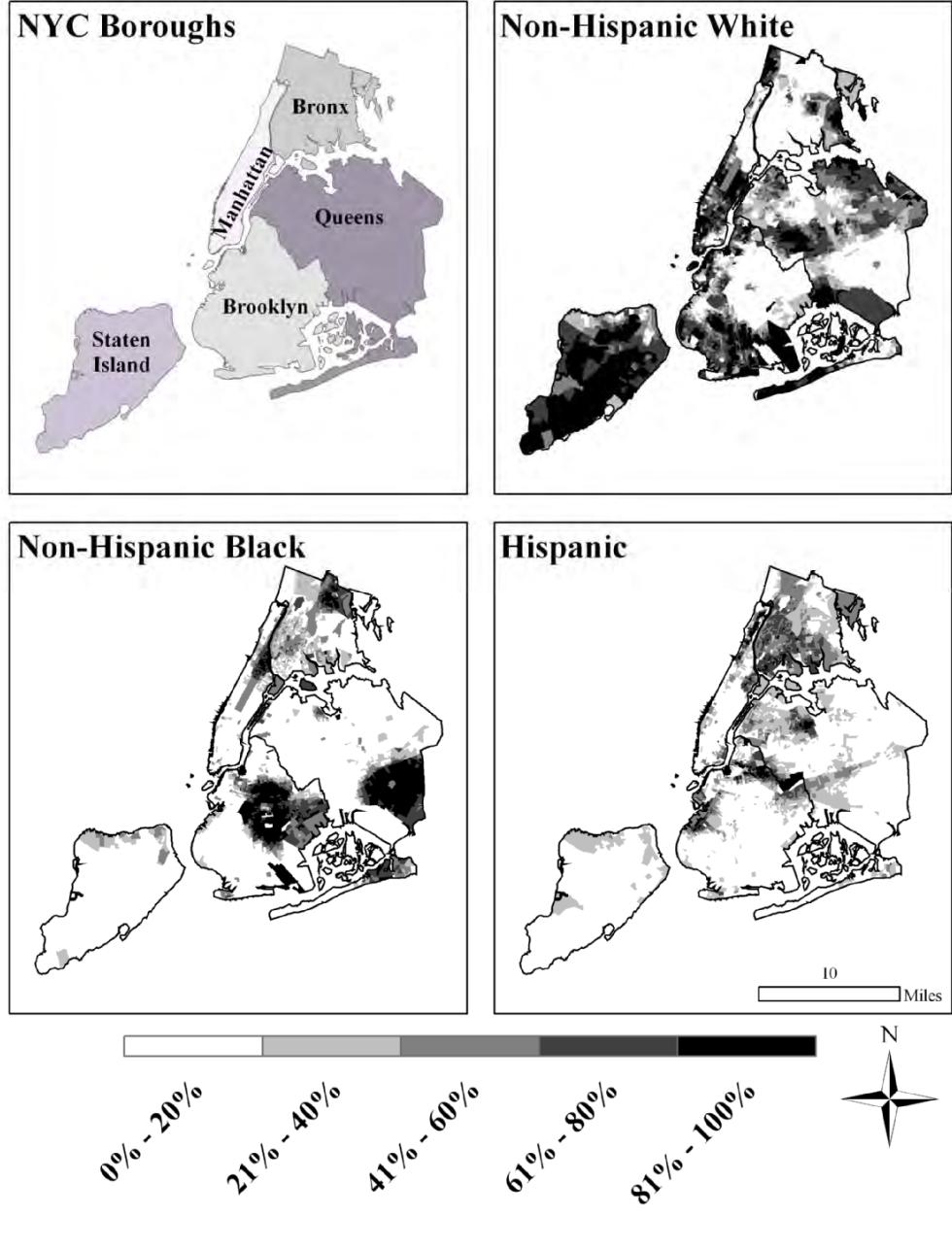
New York City's Socio-Demographic Characteristics

NYC is still a very segregated city, with Non-Hispanic Black and Hispanic populations concentrated in large sections of each of the boroughs, and Non-Hispanic White populations often separated in more affluent enclaves. The city is (as of the 2000 census) over 65% "minority." The Bronx is over 87% "minority."

In many census tracts, more than half the population is below the Federal poverty line, and the Congressional District that includes the South Bronx is the poorest in the nation. Parts of Manhattan also have some of the wealthiest census tracts in the nation. The disparity in wealth is marked, even sometimes within one city block.

Demographic (Race/Ethnicity) Characteristics in New York City

According to the 2000 Census, NYC's population was approximately 65% "minority," with the Borough of the Bronx being 87% "minority." Based on the spatial distribution of major racial/ethnic groups, NYC is still, for the most part, a segregated city.

Source: Maantay, J.A., and Maroko, A.R., 2008. Mapping urban risk: Flood hazards, race, & environmental justice in New York, *Applied Geography*, **29(4)**

Industrial Zoning in NYC
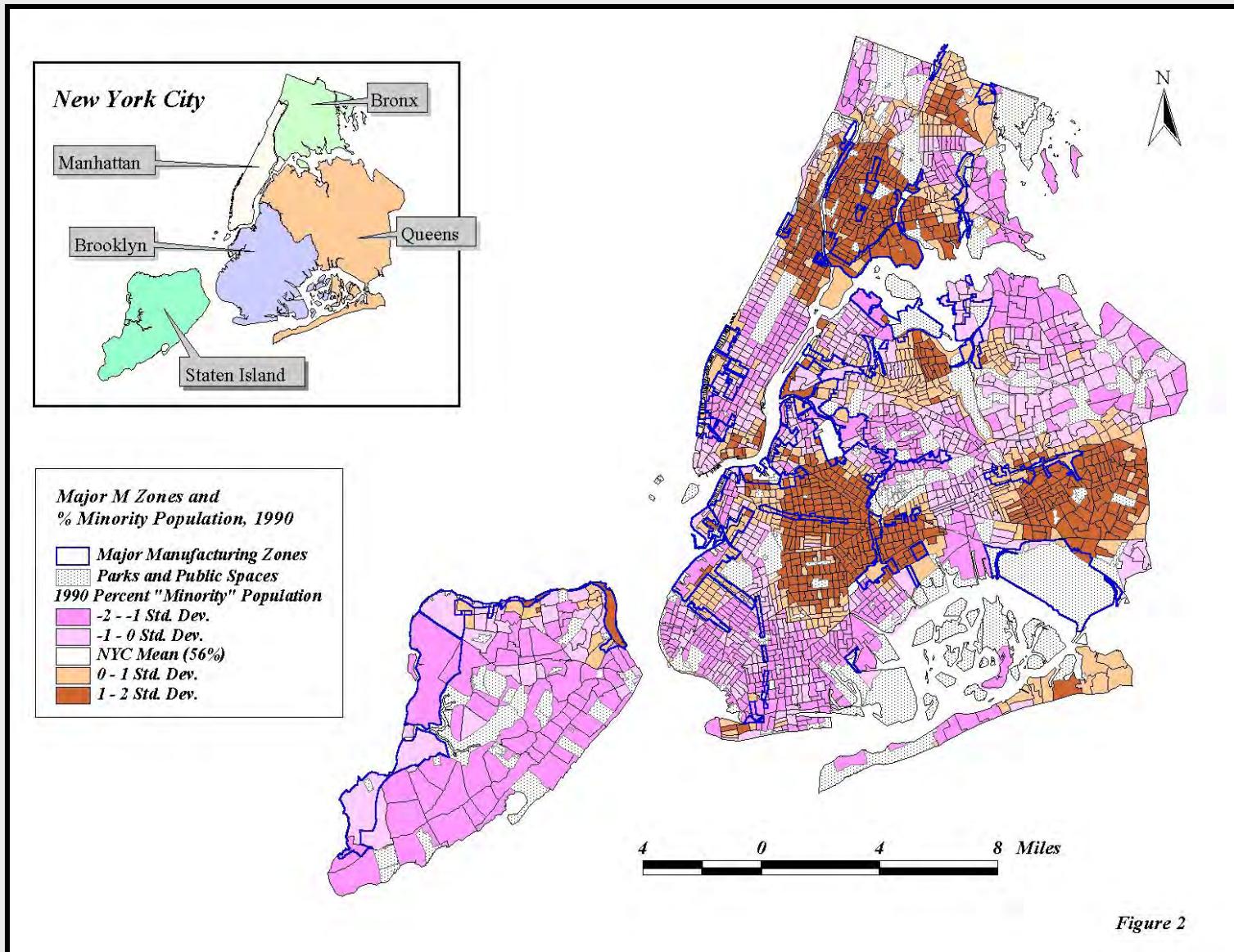
Industrial facilities and land uses can legally locate only within an industrial zone (the so-called "M," or manufacturing, zones). Many of these zones are artifacts of the historical settlement pattern of NYC, the city's role as a port/waterfront city, and the perceived need in the 19th and early 20th centuries of having working-class communities be within walking distance to the factories and ports where the nearby residents worked.

However, zoning has been changed over the years, and industrial zones have changed locations, have increased and decreased in geographic extent, and also have increased and decreased in intensity of noxious uses permitted in a given zone.

When these changes to industrial zones (from 1961-1998) were charted, it was found that increases in extent and intensity of "M" zones occurred mainly in less affluent and more minority neighborhoods, and decreases in extent and intensity occurred mainly in more affluent, white, and/or gentrifying neighborhoods.

Due to the location of NYC's industrial zones, polluting facilities and land uses impact mainly minority and lower-income communities.

Industrial Zones in NYC and "Minority" Populations

New York City

Bronx

Manhattan

Brooklyn

Queens

Staten Island

N

Major M Zones and
% Minority Population, 1990

☐ Major Manufacturing Zones
▨ Parks and Public Spaces
1990 Percent "Minority" Population
■ -2 - -1 Std. Dev.
■ -1 - 0 Std. Dev.
□ NYC Mean (56%)
■ 0 - 1 Std. Dev.
■ 1 - 2 Std. Dev.

4   0   4   8 Miles

Figure 2

Individual EJ SEAT Factors that were mapped for NYC:
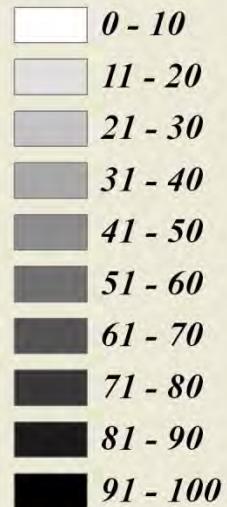
- Facility Density

- % under Poverty line

- % Minority Population

- Ozone concentration – 8-hour average

- NATA Cancer Risk

- NATA Non-Cancer Diesel Particulate Matter (PM)

- NATA Neurological and Respiratory Hazard Index

- NATA PM 2.5 Concentration

- Toxic Chemical Releases and Transfers from Industrial Facilities

NOTE: These individual factors were selected from the more comprehensive list of EJ SEAT factors, and do not represent the entire suite of factors used in creating the EJ SEAT score.
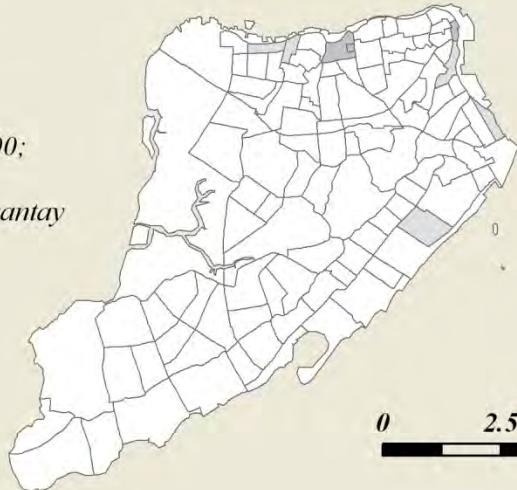
Environmental Justice SEAT Score
for New York City by Census Tracts

Facility Density -
Tracts outlined in red have scores of 91 - 100.
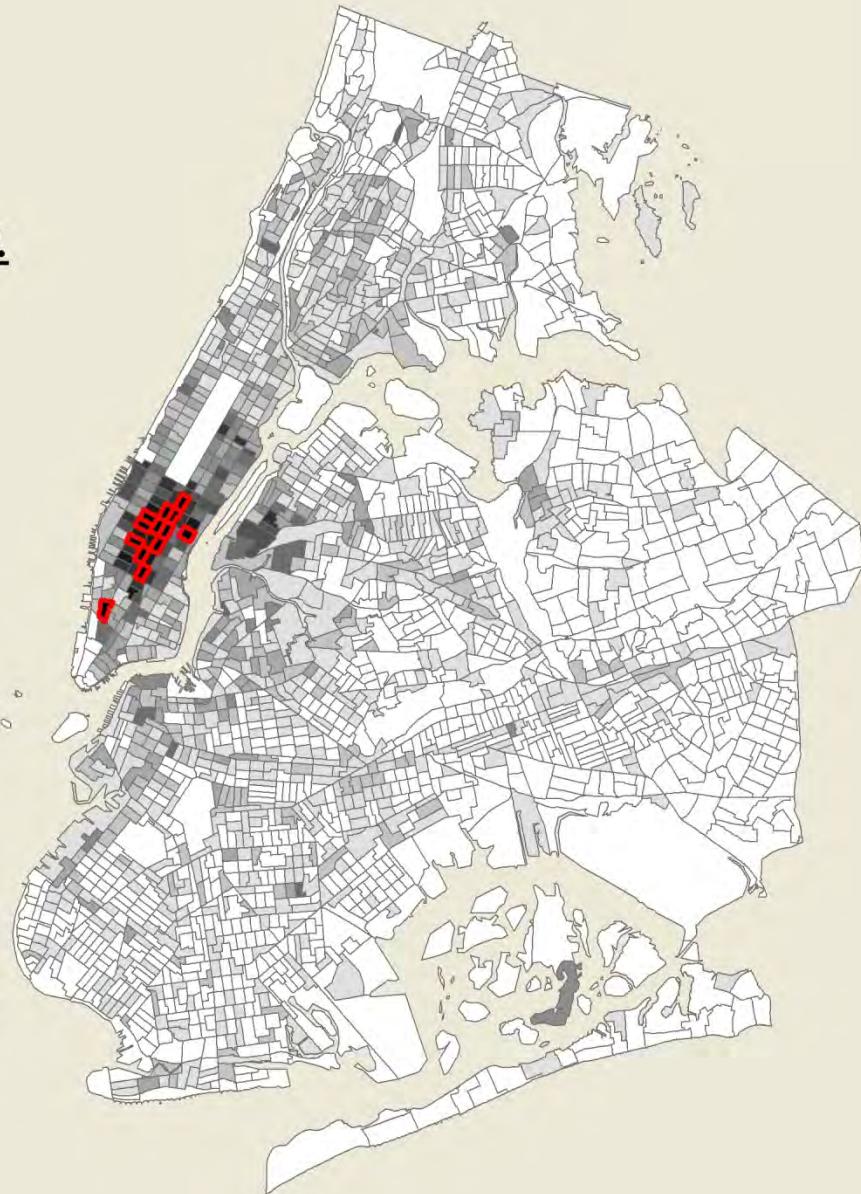
EJSEAT Score

0 - 10
11 - 20
21 - 30
31 - 40
41 - 50
51 - 60
61 - 70
71 - 80
81 - 90
91 - 100

Data Sources:
US Census Bureau, 2000;
US EPA, 2008
Map Compiled by J.Maantay
Sept. 18, 2008

0   2.5   5   10   15   20
   Miles

**Environmental Justice SEAT Score
for New York City by Census Tracts**

<u>% Under Poverty Line -</u>
<u>Tracts outlined in red have scores of 91 - 100.</u>
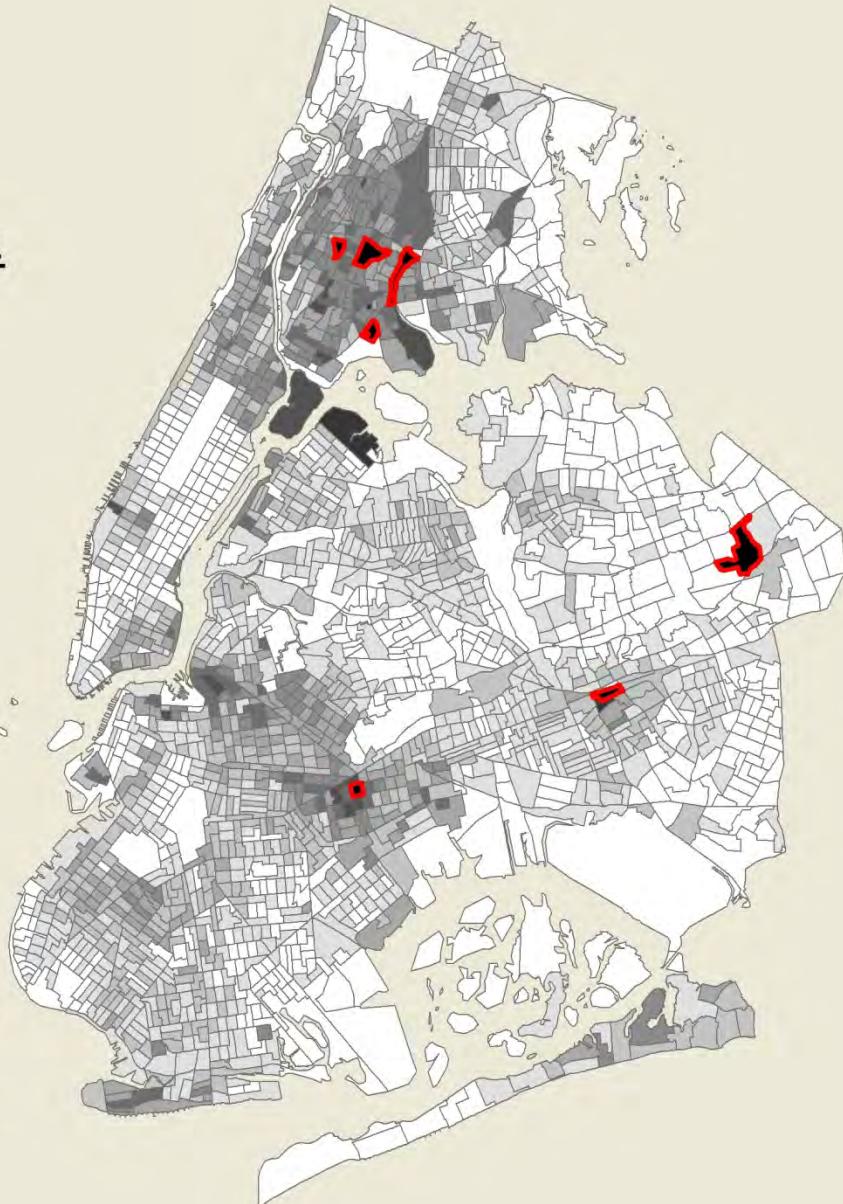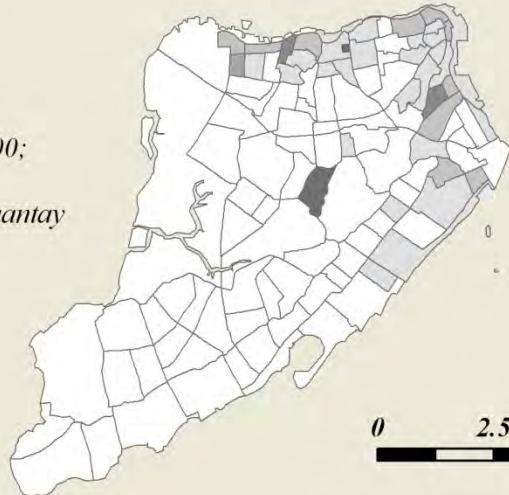
EJSEAT Score

	0 - 10
	11 - 20
	21 - 30
	31 - 40
	41 - 50
	51 - 60
	61 - 70
	71 - 80
	81 - 90
	91 - 100

Data Sources:
US Census Bureau, 2000;
US EPA, 2008
Map Compiled by J.Maantay
Sept. 18, 2008

0	2.5	5	10	15	20

Miles
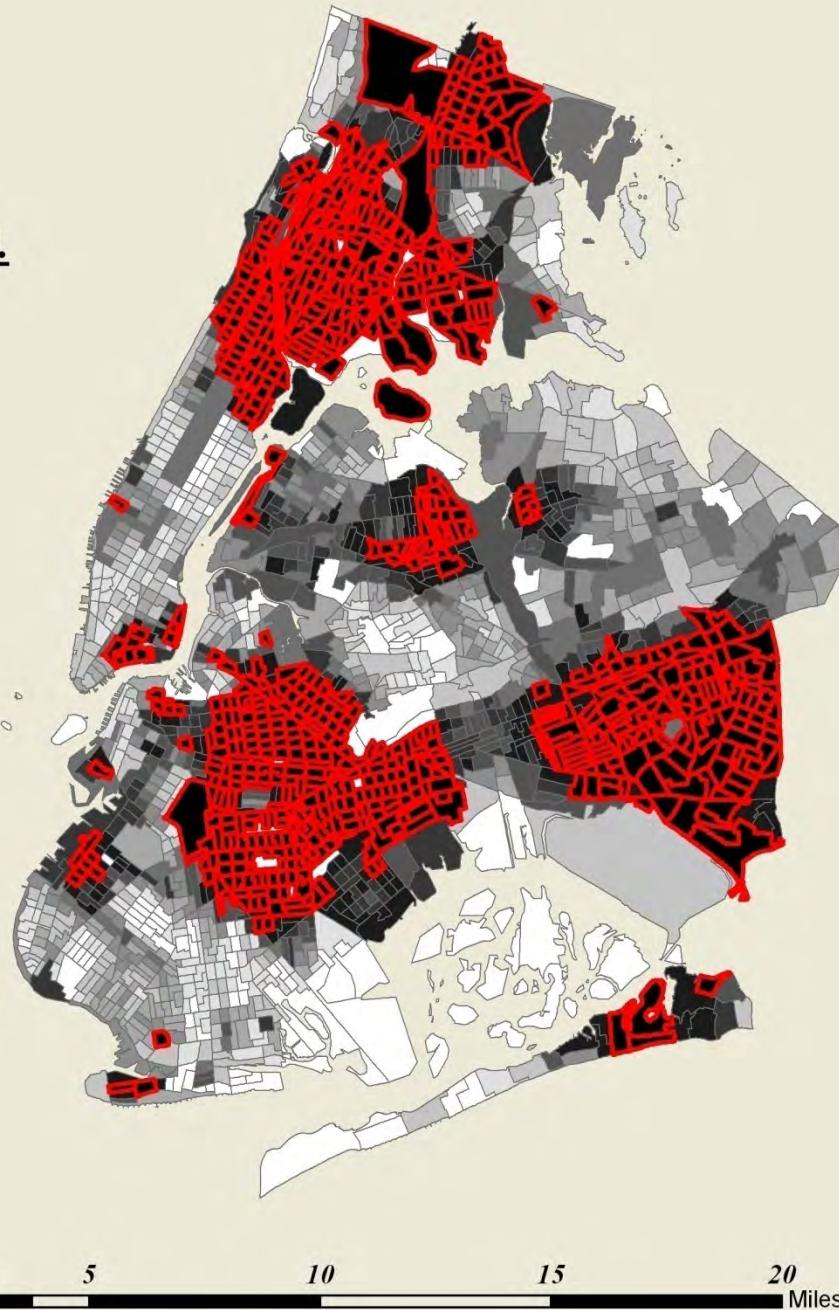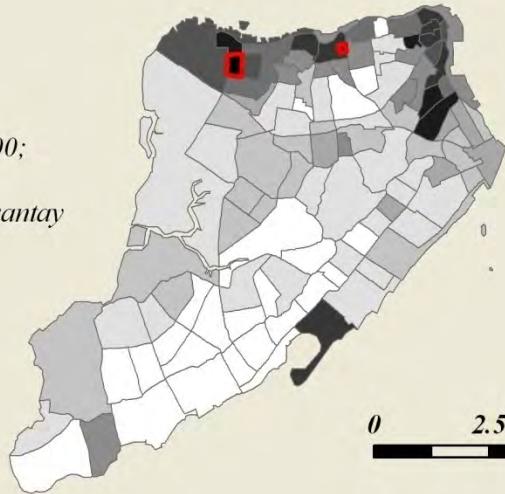
Environmental Justice SEAT Score
for New York City by Census Tracts

% Minority Population -
Tracts outlined in red have scores of 91 - 100.

EJSEAT Score

- 0 - 10
- 11 - 20
- 21 - 30
- 31 - 40
- 41 - 50
- 51 - 60
- 61 - 70
- 71 - 80
- 81 - 90
- 91 - 100

Data Sources:
US Census Bureau, 2000;
US EPA, 2008
Map Compiled by J.Maantay
Sept. 18, 2008

0   2.5   5   10   15   20
Miles

Environmental Justice SEAT Score for New York City by Census Tracts

Ozone Concentration, 8-hour average - Tracts outlined in red have scores of 60 and above.

EJSEAT Score
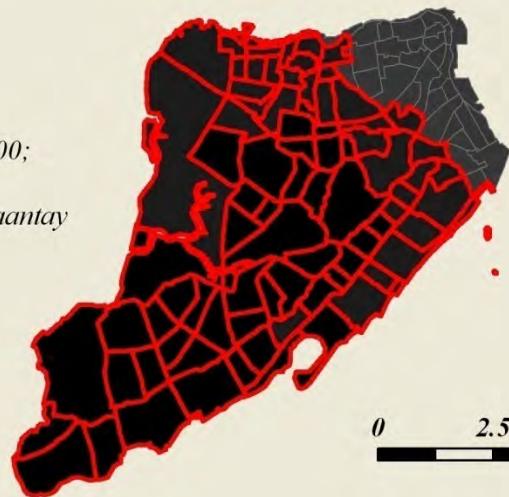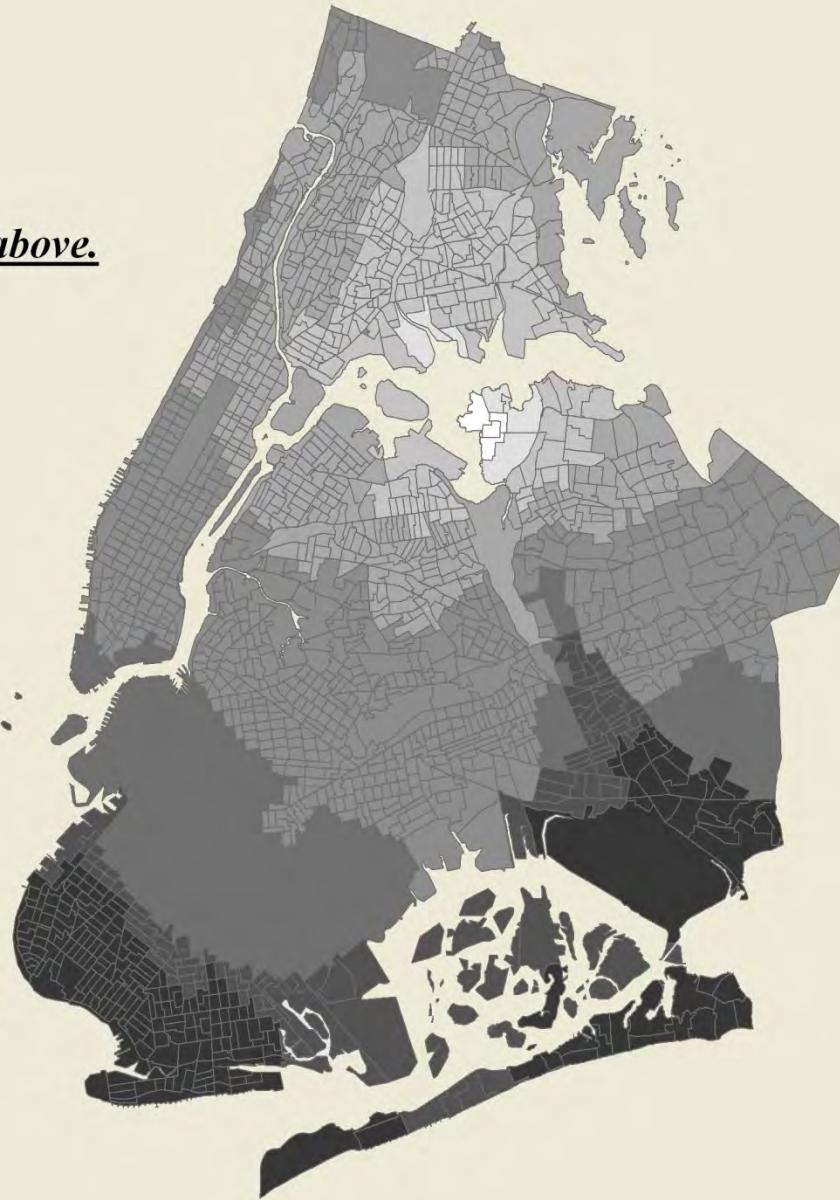
- 0 - 7
- 8 - 15
- 16 - 22
- 23 - 30
- 31 - 37
- 38 - 44
- 45 - 52
- 53 - 59
- 60 - 67
- 68 - 74

Data Sources:
US Census Bureau, 2000;
US EPA, 2008
Map Compiled by J.Maantay
Sept. 18, 2008

0   2.5   5   10   15   20
Miles
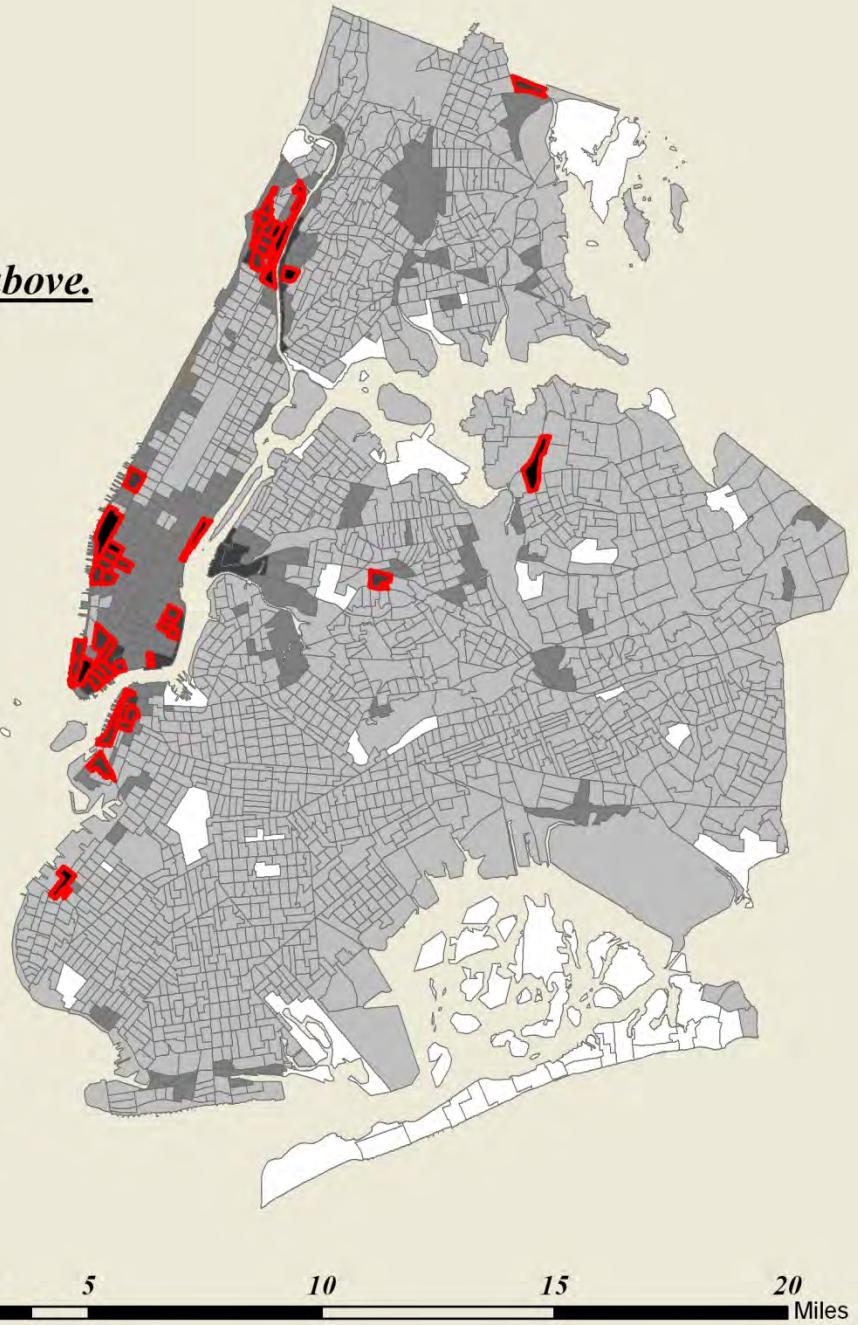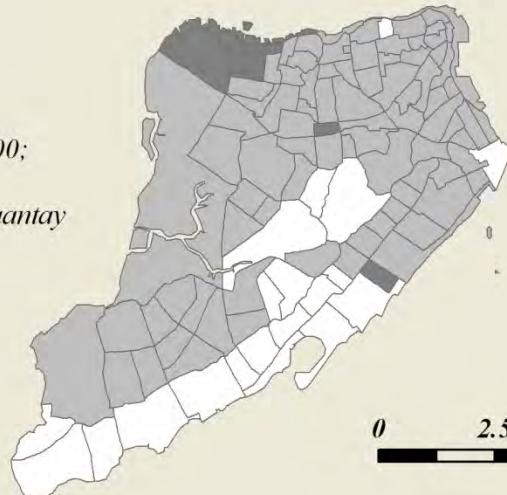
**Environmental Justice SEAT Score
for New York City by Census Tracts**

**NATA Cancer Risk -
Tracts outlined in red have scores of 32 and above.**

EJSEAT Score
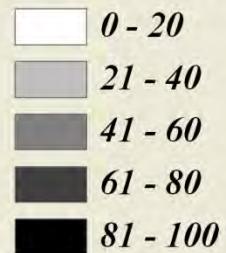
- 0 - 10
- 11 - 20
- 21 - 31
- 32 - 41
- 42 - 51

*Data Sources:
US Census Bureau, 2000;
US EPA, 2008
Map Compiled by J.Maantay
Sept. 18, 2008*

0   2.5   5   10   15   20
Miles
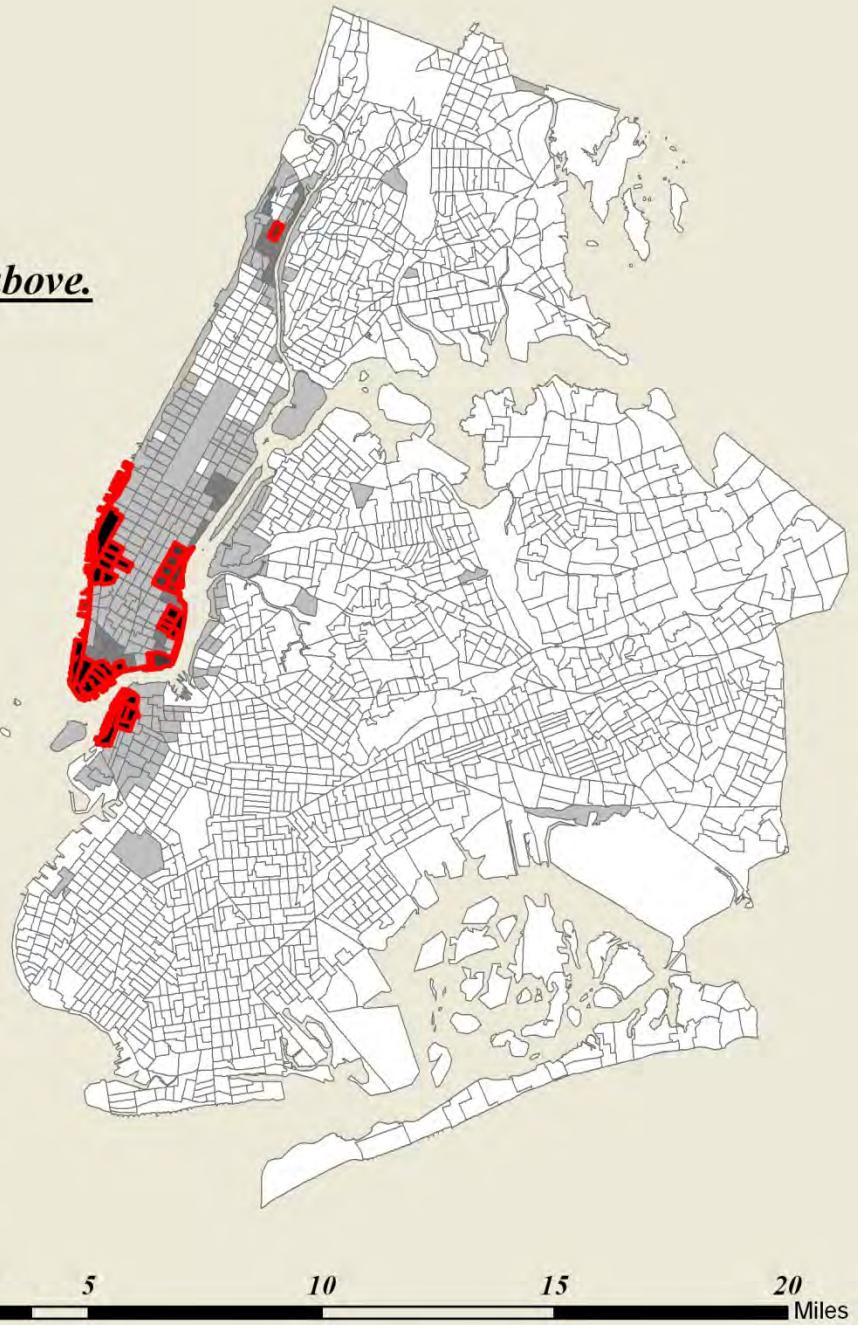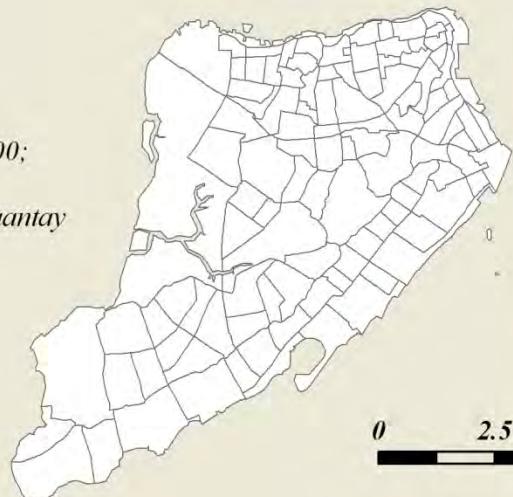
Environmental Justice SEAT Score
for New York City by Census Tracts

NATA Non-Cancer Diesel PM -
Tracts outlined in red have scores of 61 and above.
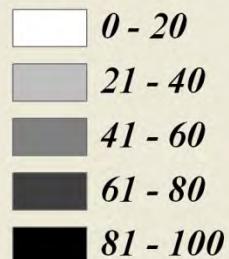
EJSEAT Score

- 0 - 20
- 21 - 40
- 41 - 60
- 61 - 80
- 81 - 100

Data Sources:
US Census Bureau, 2000;
US EPA, 2008
Map Compiled by J.Maantay
Sept. 18, 2008

0   2.5   5   10   15   20
Miles

Environmental Justice SEAT Score for New York City by Census Tracts

NATA Neurological and Respiratory Hazard Index - Tracts outlined in red have scores of 61 and above.
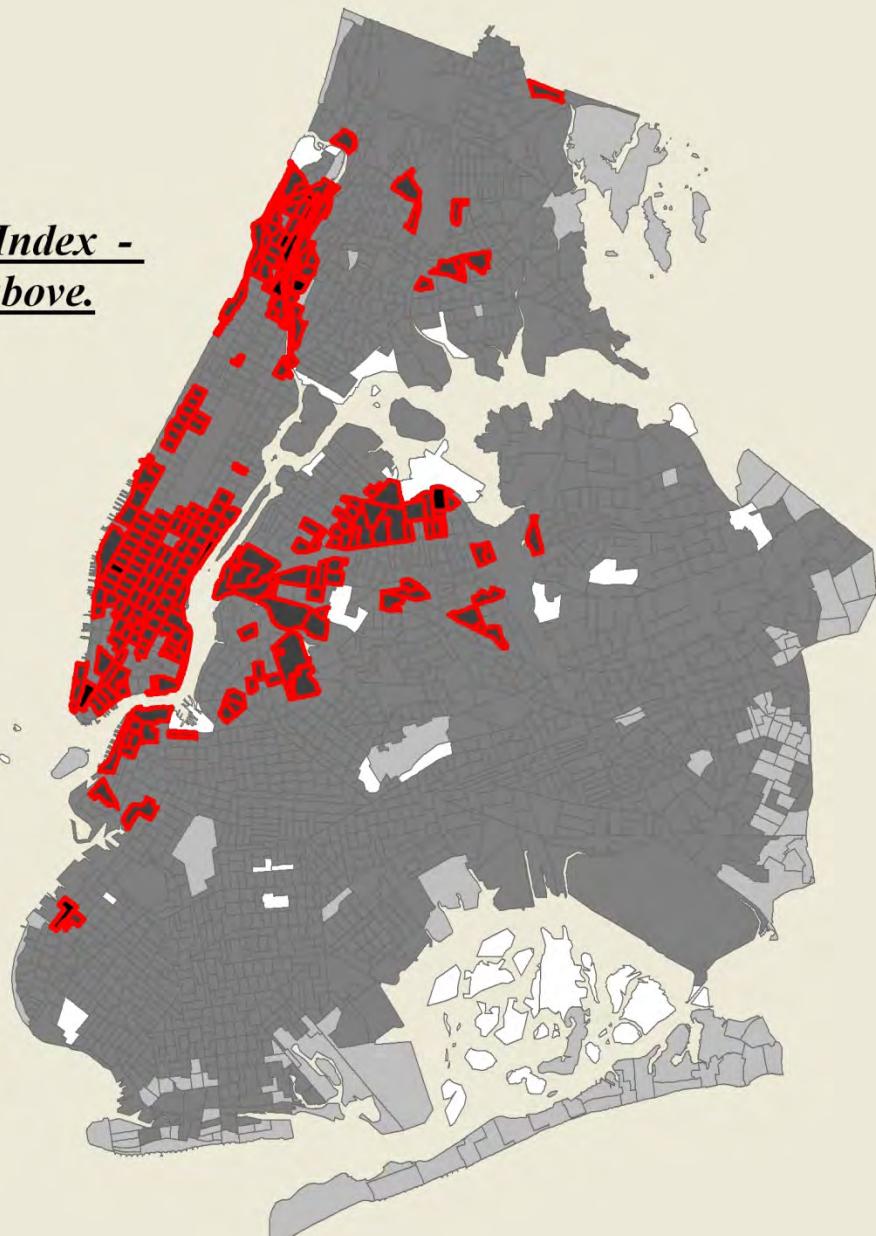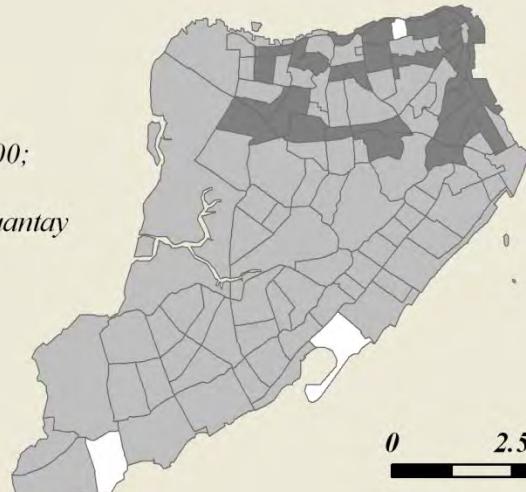
EJSEAT Score

- 0 - 20
- 21 - 40
- 41 - 60
- 61 - 80
- 81 - 100

Data Sources:
US Census Bureau, 2000;
US EPA, 2008
Map Compiled by J.Maantay
Sept. 18, 2008
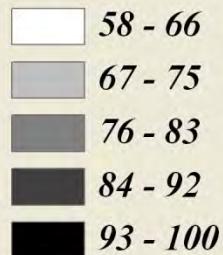
0   2.5   5   10   15   20
Miles
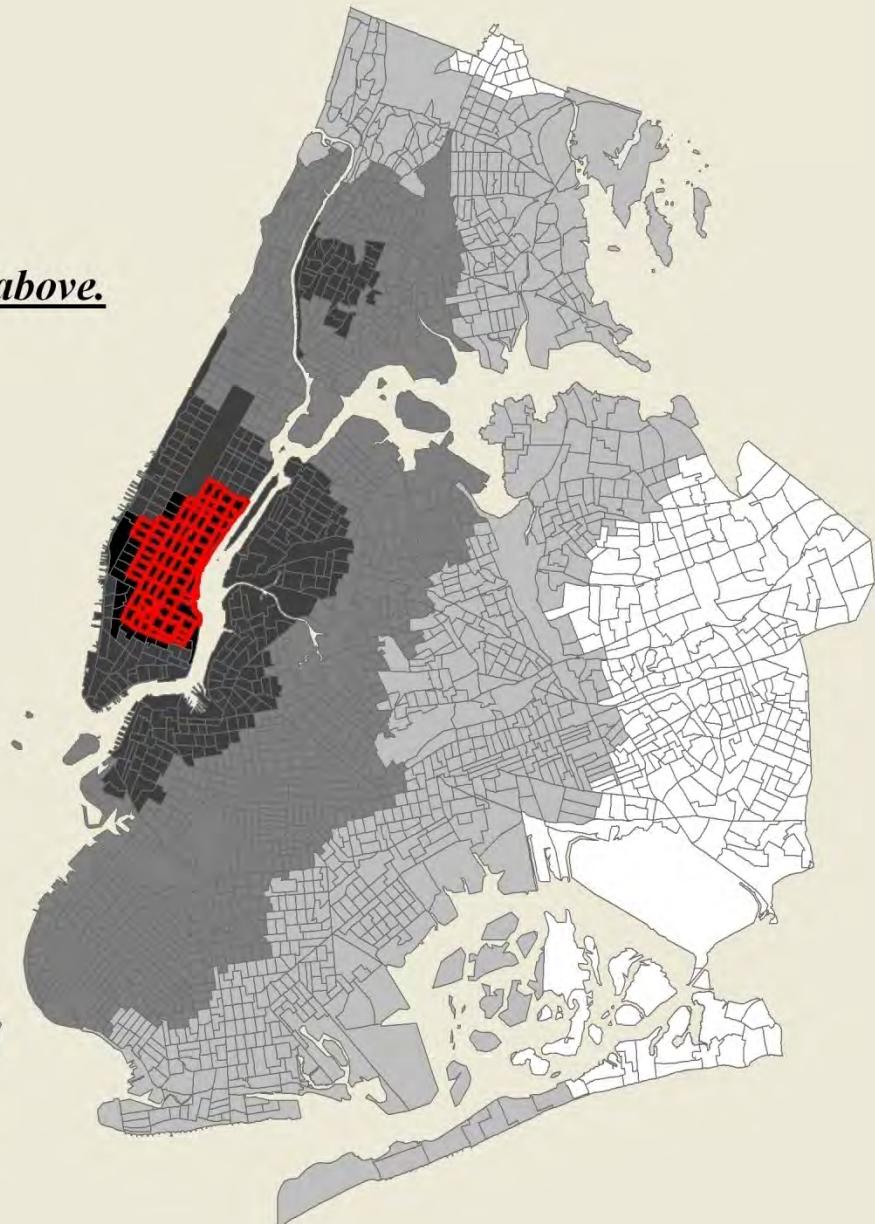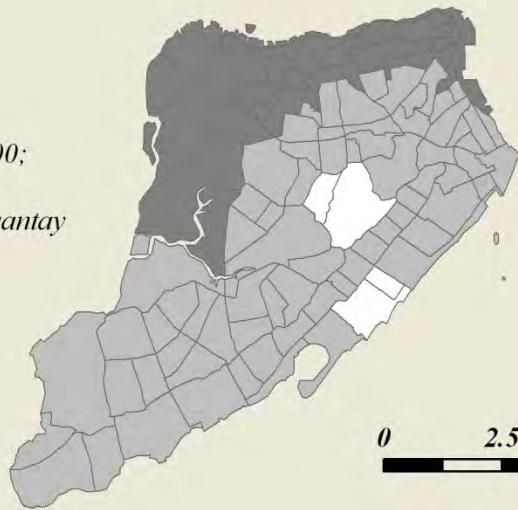
Environmental Justice SEAT Score
for New York City by Census Tracts

NATA PM 2.5 Concentration -
Tracts outlined in red have scores of 93 and above.

EJSEAT Score

☐	58 - 66
▨	67 - 75
▨	76 - 83
▨	84 - 92
■	93 - 100
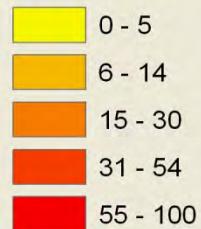
0   2.5   5   10   15   20
Miles
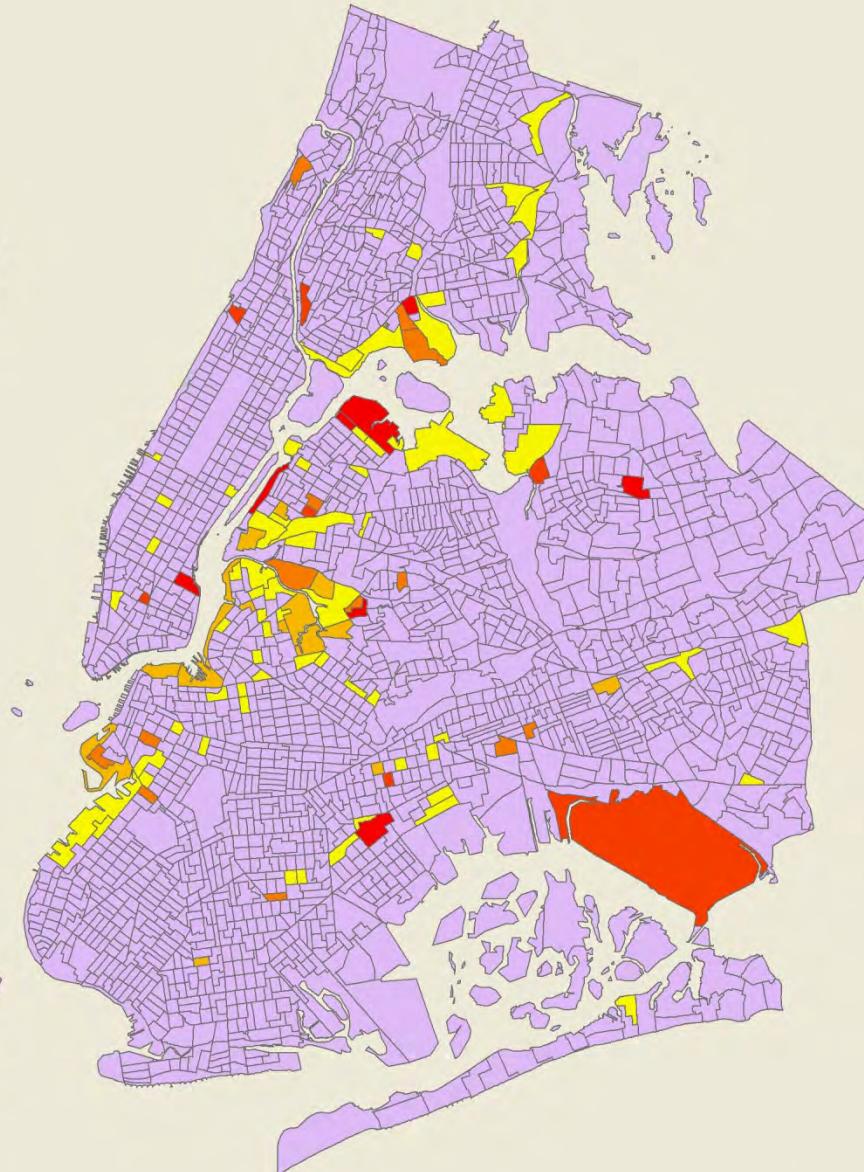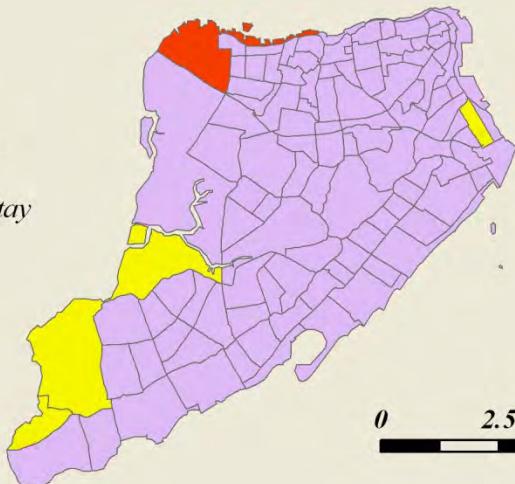
Environmental Justice SEAT Score for New York City by Census Tracts

Toxic Chemical Releases and Transfers from Industrial Facilities - Tracts in yellow to red have scores, the others have no scores.

Toxic Chemical Releases

- 0 - 5
- 6 - 14
- 15 - 30
- 31 - 54
- 55 - 100

Data Sources:
US Census Bureau, 2000;
US EPA, 2008
Map Compiled by J.Maantay
Sept. 18, 2008

0   2.5   5   10   15   20
Miles

Possible Anomalies Raising Questions about the validity of EJ SEAT Scores in NYC:

- Facility Density score highest in mid-town Manhattan?

- % Under Poverty Line highest in parks and uninhabited islands?

- 8-hour Ozone concentration highest in Staten Island?

- Cancer risk highest in the Financial District, West Side of midtown, and Washington Heights in Manhattan, and Sunset Park, Brooklyn?

- Non-cancer Diesel 2.5 highest in coastal areas of lower Manhattan and Brooklyn Heights? Most of the city is in 0-20 range?

- Neurological and Respiratory Hazard Index highest in Manhattan below Central Park, upper Manhattan, and scattered parts of Queens, Brooklyn, and the Bronx (some are parks)?

- PM 2.5 concentration highest in east side of Manhattan?
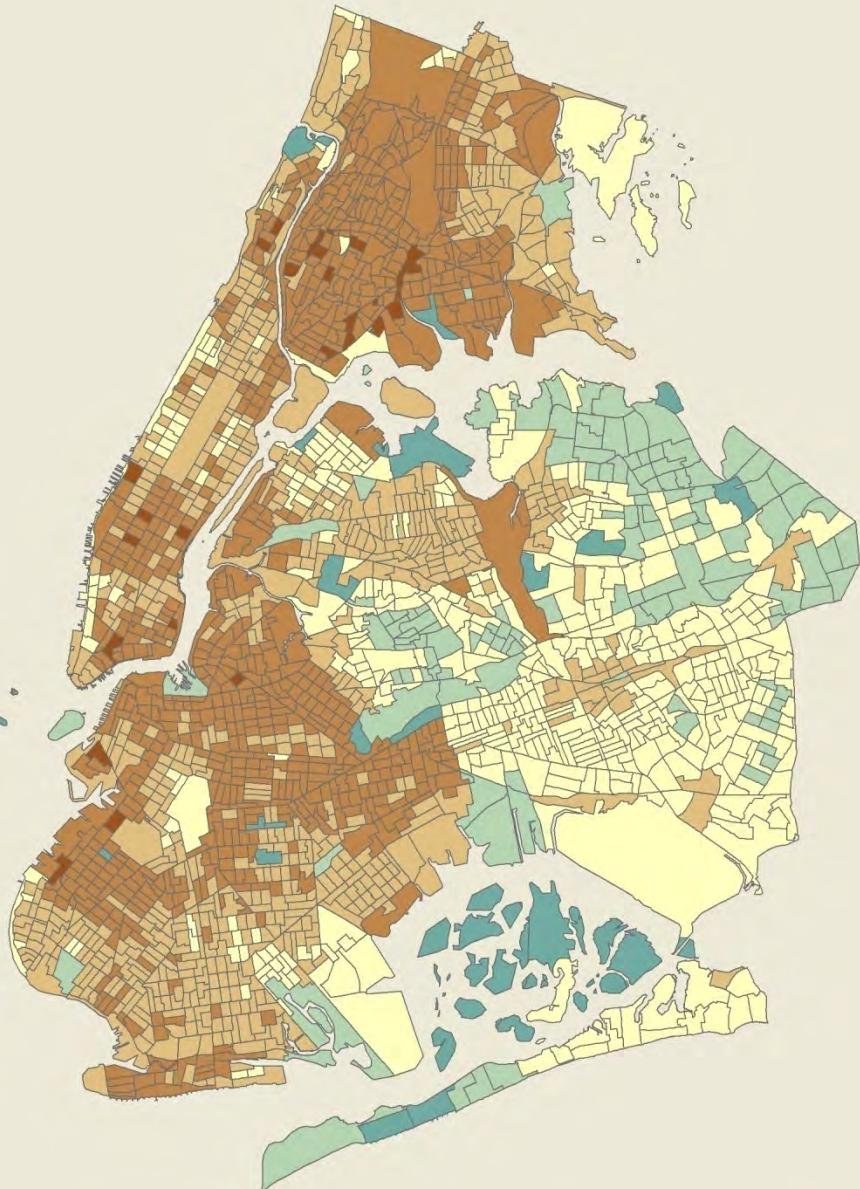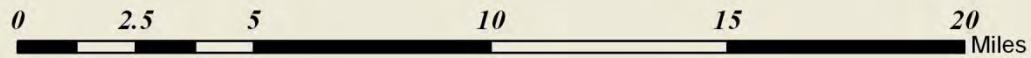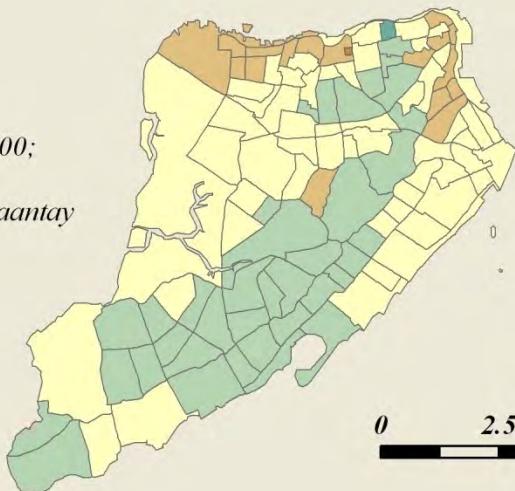
Environmental Justice SEAT Score for New York City by Census Tracts

EJSEAT Score

- *< -3 Std. Dev. (7 - 33%)*
- *-3 - -2 Std. Dev. (34 - 50%)*
- *-2 - -1 Std. Dev. (51 - 66%)*
- *-1 - 0 Std. Dev. (67 - 83%)*
- *0 - 2 Std. Dev. (84 - 99%)*
- *2 - 2 Std. Dev. (100%)*
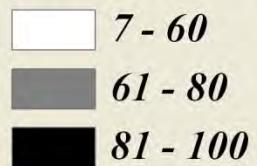
EJ SEAT Scores for New York City range from 7% to 100 %, with an average of 75%. Of the 2, 217 census tracts in NYC, 964 have an EJ SEAT Score of 80% or above.

Data Sources:
US Census Bureau, 2000;
US EPA, 2008
*Map Compiled by J.Maantay*
Sept. 18, 2008

0   2.5   5   10   15   20
Miles

Environmental Justice SEAT Score for New York City by Census Tracts

EJ SEAT Score

- ☐ *7 - 60*
- ▨ *61 - 80*
- ■ *81 - 100*

EJ SEAT Scores for New York City range from 7% to 100 %, with an average of 75%. Of the 2, 217 census tracts in NYC, 964 have an EJ SEAT Score of 80% or above.

Data Sources:
US Census Bureau, 2000;
US EPA, 2008
Map Compiled by J.Maantay
Sept. 18, 2008

# Environmental Justice SEAT Score for New York City by Census Tracts

EJ SEAT Score

- 7 - 60
- 61 - 80
- 81 - 100

EJ SEAT Scores for New York City range from 7% to 100 %, with an average of 75%. Of the 2, 217 census tracts in NYC, 964 have an EJ SEAT Score of 80% or above.

Environmental Justice SEAT Score for New York City by Census Tracts

Parks and Public Open Space

EJSEAT Score

- 7 - 30 %
- 31 - 57 %
- 58 - 72 %
- 73 - 86 %
- 87 - 100 %

Tracts outlined in red have an EJ SEAT score of 30% or under. These areas are mainly parks, airports, and protected open space.
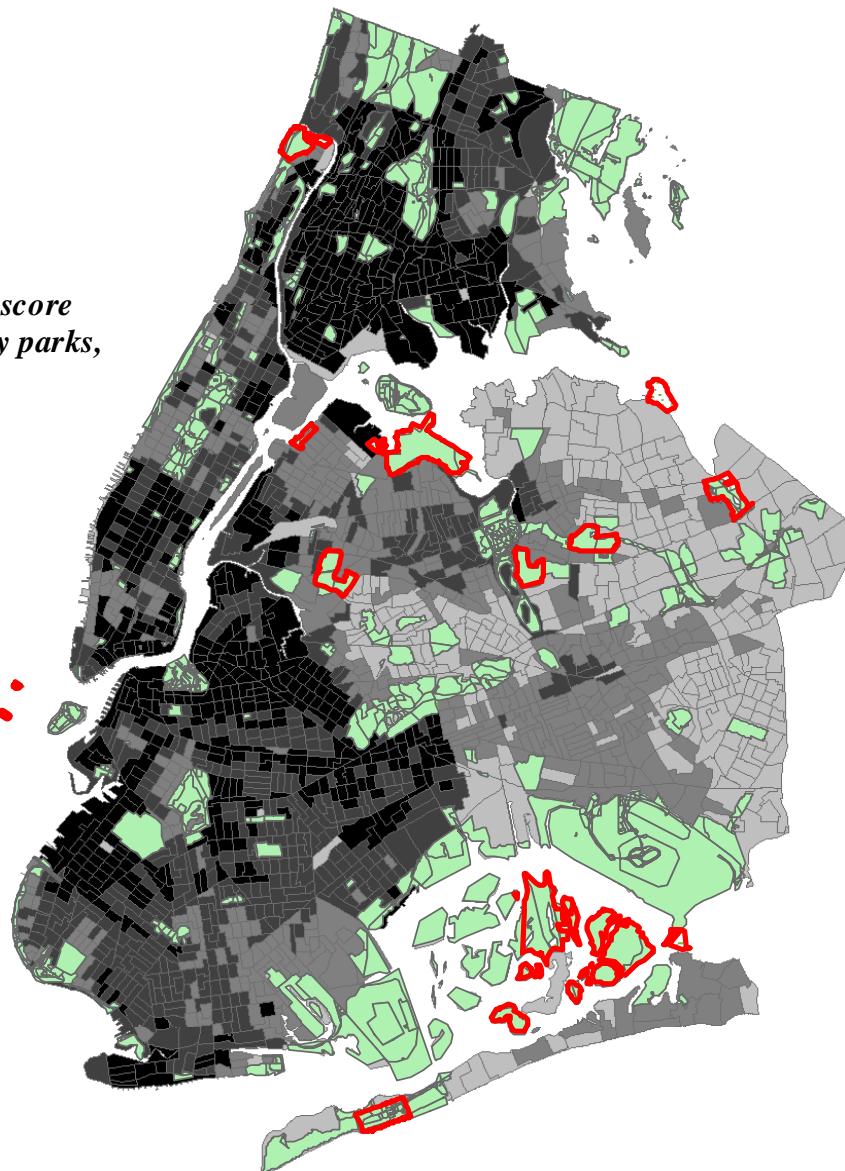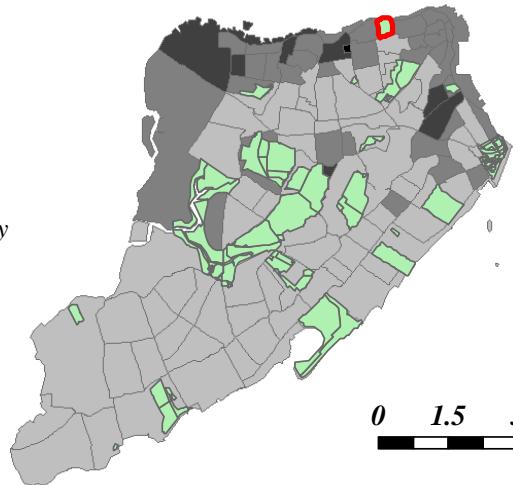
EJ SEAT Scores for New York City range from 7% to 100 %, with an average of 75%. Of the 2, 217 census tracts in NYC, 964 have an EJ SEAT Score of 80% or above. Eleven tracts (mainly parks, airports, and protected wetlands) have an EJ SEAT score of < 30%. The median is 78% and the mode is 99%.
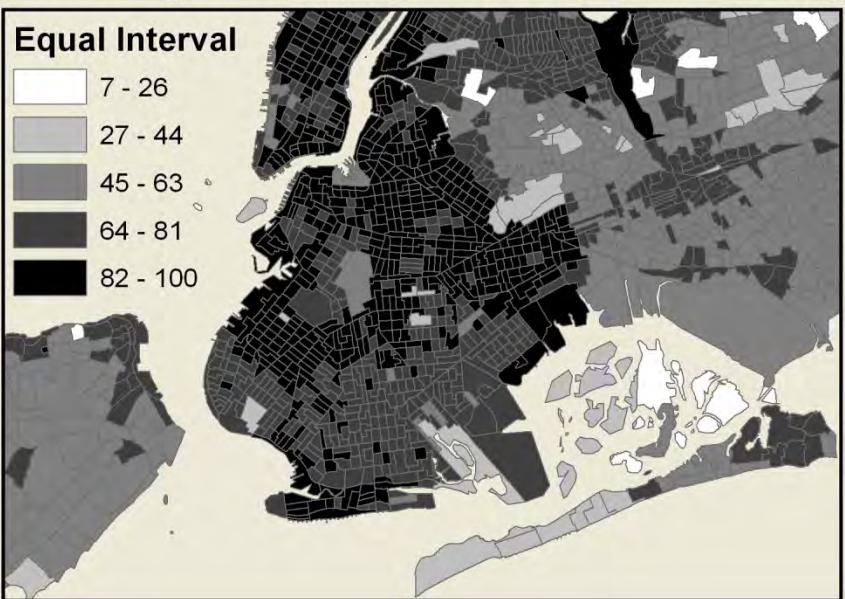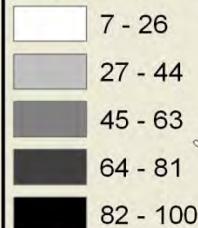
Data Sources:
US Census Bureau, 2000;
US EPA, 2008
Map Compiled by J.Maantay
Sept. 18, 2008
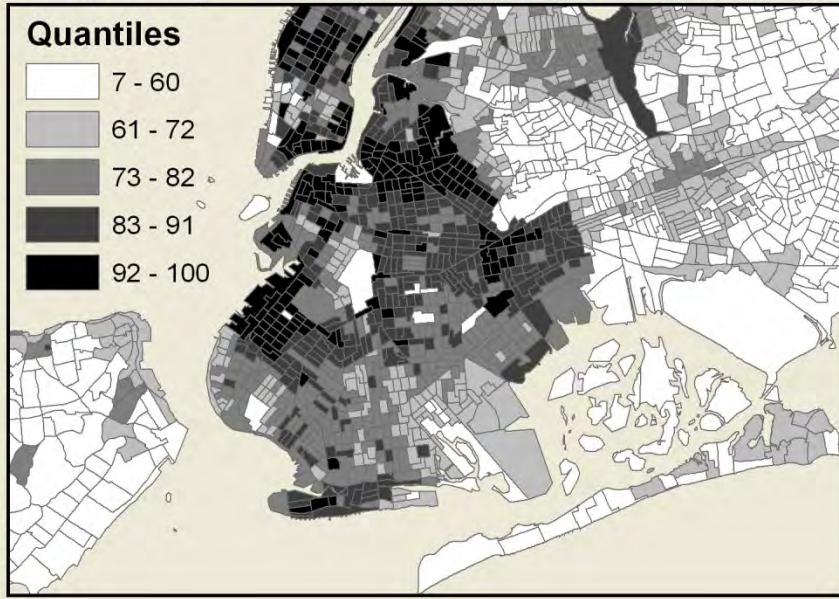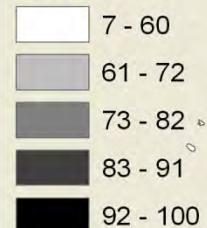
0   1.5   3   6   9   12
Miles

Zooming in to EJ SEAT Scores in Brooklyn, Comparing Classification Methods
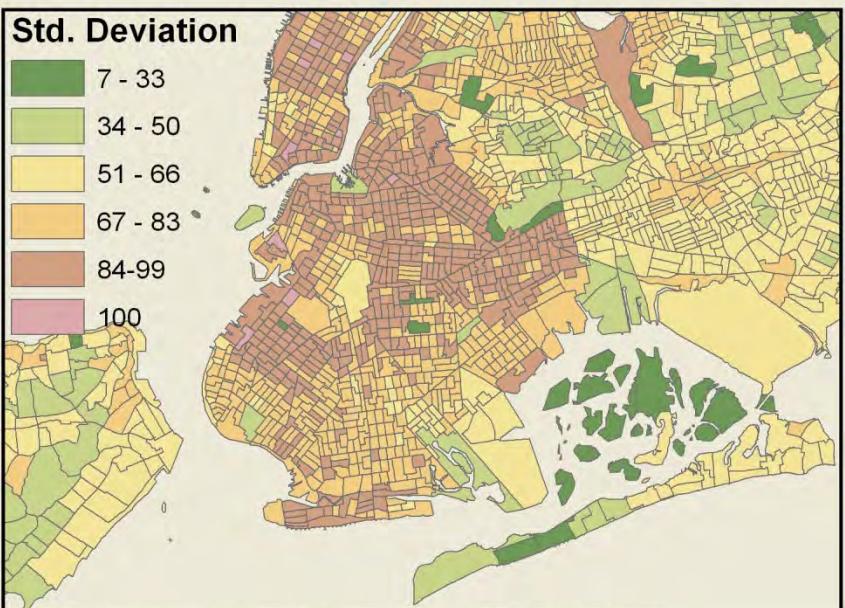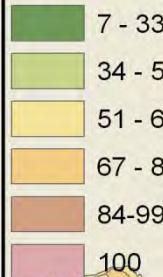
Equal Interval
- 7 - 26
- 27 - 44
- 45 - 63
- 64 - 81
- 82 - 100
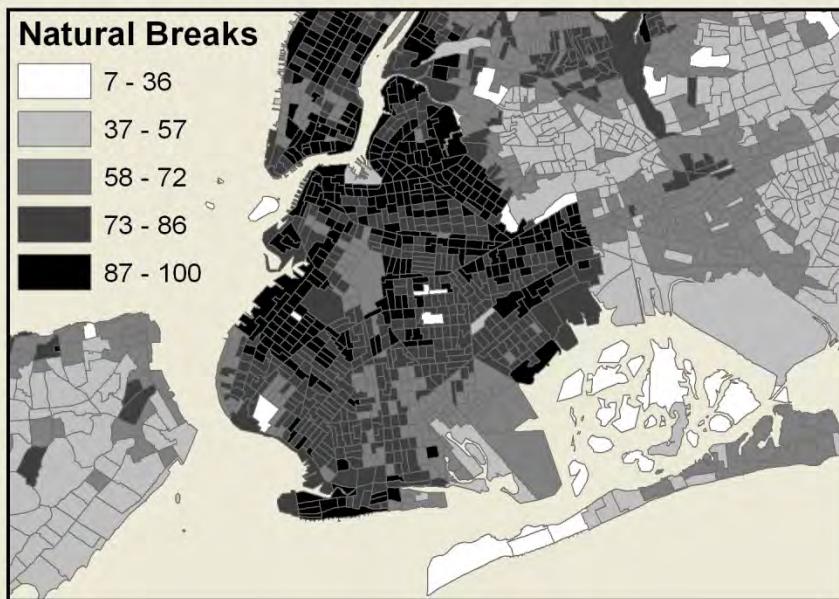
Quantiles
- 7 - 60
- 61 - 72
- 73 - 82
- 83 - 91
- 92 - 100

Std. Deviation
- 7 - 33
- 34 - 50
- 51 - 66
- 67 - 83
- 84 - 99
- 100

Natural Breaks
- 7 - 36
- 37 - 57
- 58 - 72
- 73 - 86
- 87 - 100

Data Sources: US Census Bureau, 2000; US EPA, 2008.
Map Compiled by J.Maantay, Sept. 18, 2008

Possible Concerns with EJ SEAT in hyper-heterogeneous urban areas like New York City:

• Census tracts are small in area, and it is difficult to avoid "edge effects," and MAUP (the Modifiable Areal Unit Problem). Adjacent census tracts tend to have similar environmental exposures and burdens, the tract boundary is no barrier for exposures/burdens, yet because of the way EJ SEAT is constructed, adjacent tracts could have very different scores.

• Parks in densely developed urban areas like NYC tend to have their own census tracts, obviously containing little actual census population, but nevertheless show up as large areas of usually extremely high or low EJ SEAT scores. This is visually misleading, and will tend to skew statistical analyses.

• <u>All</u> tracts in urbanized areas like NYC have relatively high EJ SEAT scores, compared to the rest of the state. Although the range is from 7% - 100%, the lower scores (11 tracts @ <30 %) are outliers and represent mainly uninhabited areas, (airports, parks, wetlands) while almost half of the 2,217 tracts are > 80%. The average is 75%, the median is 78%, the mode is 99% (the most frequent value).