

Using CBPR to Promote Environmental Policy Action in Detroit, Michigan

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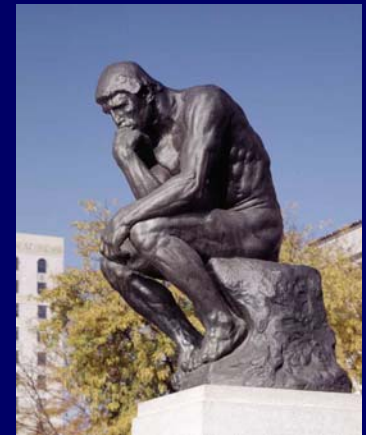
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2007 APHA Annual Meeting & Exposition
November 6, 2007



NIEHS

Funded by the National Institute of Environmental Health Sciences (R01-ES010688, P01-ES09589)
and the Environmental Protection Agency (P01-ES09589)



U.S. EPA

Background on CAAA

- Community Action Against Asthma (CAAA) is an affiliated project of the Detroit URC and conducts research according to the principles of CBPR.

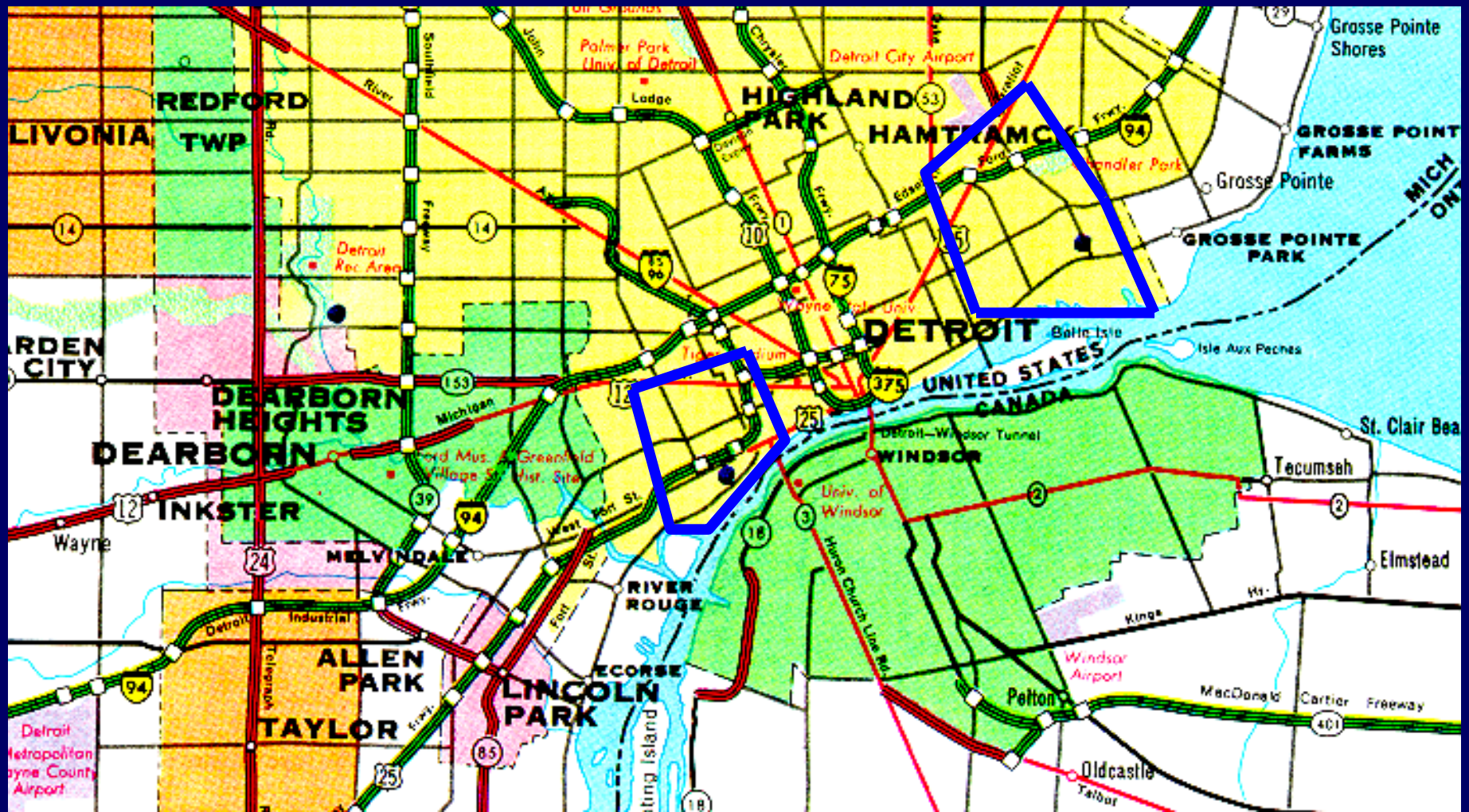
Israel, B.A., Eng, E., Schulz, A.J., & Parker, E.A. (eds.). Methods in Community-Based Participatory Research for Health. San Francisco, CA: Jossey-Bass. (2005)

- In 1998, the URC was funded (NIEHS & EPA) to create the Michigan Center for the Environment & Children's Health (MCECH), one of eight "Centers of Excellence for Children's Environmental Health".
- CAAA (one of the core projects of MCECH) conducts research on environmental triggers of asthma focusing on indoor and outdoor sources.

CAAA Projects

- **Original Project (1999 – 2002):**
 - Household Intervention
 - Exposure and Health Effects Study
- **Current Projects (2007 – 2012):**
 - Household Air Filter and Air Conditioner Intervention
 - Assessment of Vehicular Exhaust and Health Effects

CAAA Detroit Communities



5 km

CAAA Exposure Measurements

Exposure Assessment Field Intensives -each season for 3 years (10/99-05/02)

- Two weeks in duration (total of 11 seasonal assessments)
- Daily ambient measures of $PM_{2.5}$, PM_{10} , ozone, meteorological variables in each community
- Daily indoor measures of $PM_{2.5}$, PM_{10} , and VPN in homes of 20 children
- Daily personal exposure monitoring of PM_{10} for 20 children

CAAA Health Measurements

- Correlated with exposure measurements schedule (11 seasonal assessments – two weeks in duration)
- Daily pulmonary function measures
- Daily diary reporting of medication & symptoms:
 - Corticosteroid use
 - Respiratory infection
 - Wheezing
 - Chest tightness
 - Shortness of Breath
 - Cough

Findings from the Exposure and Health Effects Study

Air Quality:

- PM_{2.5} levels in Southwest and East Detroit exceed EPA national air quality standards.
- PM_{2.5} levels in Southwest Detroit 19% higher than levels in East Detroit.

Health Effects:

- PM_{2.5} was associated with poorer lung function 3-5 days after exposure.
- PM_{2.5} and ozone were both associated with poorer lung function 2 days after exposure.

Dissemination/Advocacy Activities - Exposure and Health Effects Study

1. Community Forums
2. Fact Sheets
3. Presentations to Key Environmental Groups
4. Participated in grassroots campaign to close the Hamtramck medical waste incinerator
5. Transportation-related advocacy

Findings from the Source Apportionment Study

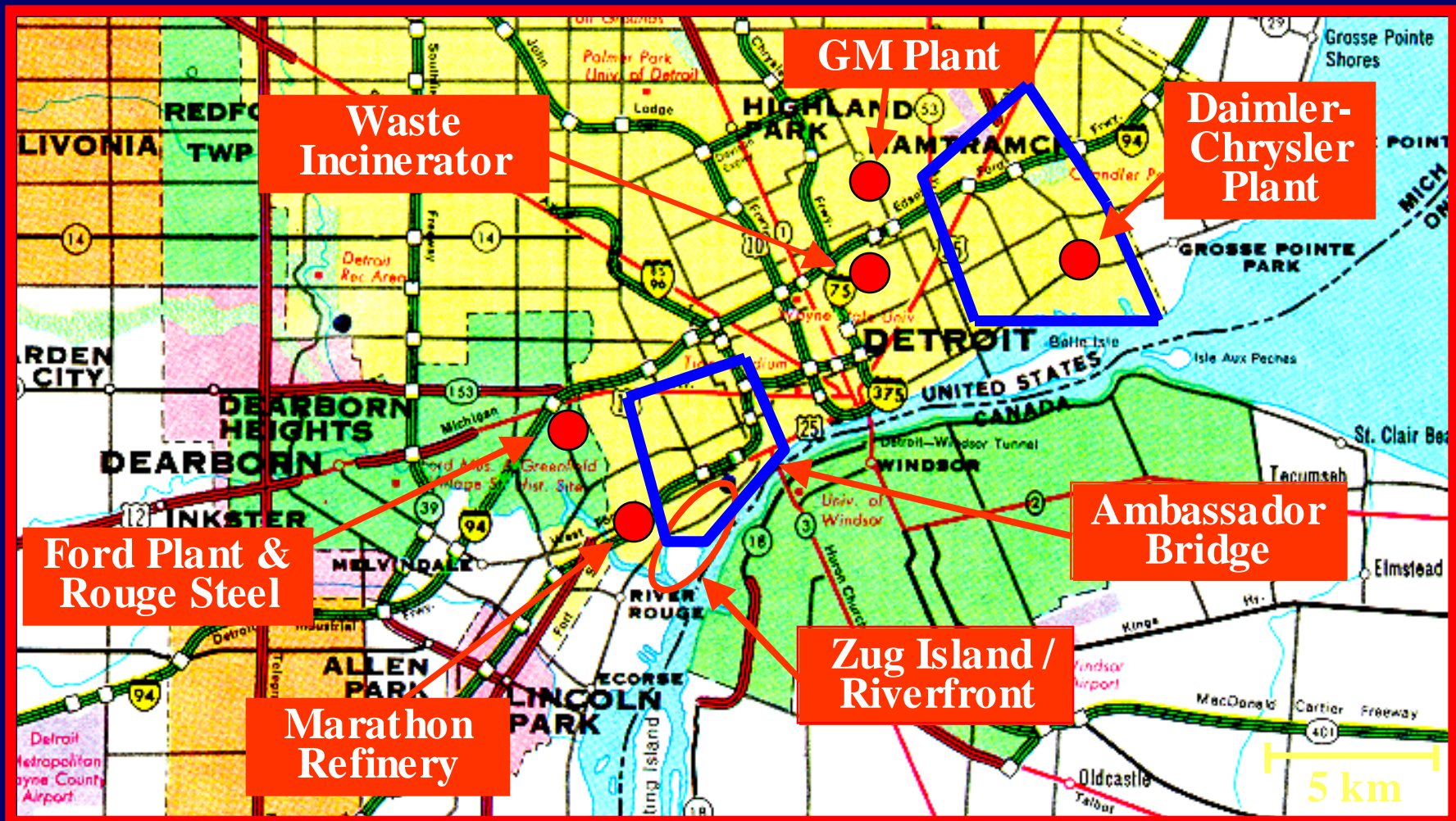
Air Quality:

- Roughly 90% ($> 15 \mu\text{g}/\text{m}^3$) of $\text{PM}_{2.5}$ in Detroit originates from coal combustion & motor vehicles (MV).
- MV emissions in SW Detroit are uncorrelated indicating an impact from a local source of diesel PM in SW Detroit.

Health Effects:

- In Southwest Detroit, $\text{PM}_{2.5}$ and coal combustion sources were associated with nighttime wakeup, wheezing and shortness of breath 2-5 days after exposure.
- More investigation into local coal combustion sources.

Detroit PM_{2.5} Stationary Sources



Dissemination/Advocacy Activities – Source Apportionment Study

1. Community Presentations

2. Fact Sheets & White Paper



3. Presentations to members of Michigan congressional delegation.

4. Provide results to SEMCOG as they develop strategies to reach $PM_{2.5}$ attainment in Detroit

Visibility Reduction in Detroit



Next Steps

- Finalize results of the CAAA source-specific health effects analysis (diary symptoms and lung function).
- Disseminate findings of the analysis to the community and interested groups.
- Develop fact sheet.
- Publish the findings.