

# Engineering Infrastructures Environmental Health

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# *Water & Environmental Health*

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- *In 1997, EPA announced a new national program to reduce the potential public health risk of getting infectious diseases from swimming or playing in contaminated beach water.*
- *Through the Beaches Environmental Assessment, Closure and Health (BEACH) Program, EPA will work with State, Tribal and local governments to ensure effective beach monitoring and advisory programs are in place, that bacteriological criteria in water quality standards programs are protective, to improve detection methods and create predictive models, and to keep the public informed.*
- *EPA's Great Lakes National Program Office (GLNPO) has been conducting annual surveys of beach closings for the 582 recognized beaches along the U.S. coast of the Great Lakes.*

# BUSH TO BLOCK SEWER FUNDING

Environmental Reporter  
April 16, 2007

Congress appears poised to approve billions of dollars to help cities renovate their aging sewage systems. That could prevent a lot of sewage dumps into lakes and rivers. But the funding - if approved by Congress - **might not get the President's signature.**

Many American cities have sewage systems that dump untreated sewage into nearby waters during heavy rainstorms. The problem contributes to beach closings, and in some places, sewage even backs up into people's basements.

But the price tag to fix one mid-size sewage treatment system can be hundreds of millions of dollars. Without federal help that can be out of reach for many cities. "We have systems all around the country kind of hitting that place where there's a lot of population growth and older systems, and all of a sudden they've kind of come up with a perfect storm causing a lot of sewage." (Katherine Baer, American Rivers)

# Original Foundations of EJ Discourse

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- Procedural Equity
  - exclusionary practices...and public hearings held in remote locations at inconvenient times”
- Geographical Equity
  - inequitable “location and spatial configuration of communities to environmental hazards
- Social Equity
  - “the role of sociological factors (race, ethnicity, class, culture, political power, etc.) on environmental decision making” (social equity)

# *Engineering Equity*

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Environmental pollution which is at the center of all past and current EJ (health) controversies is usually industrial wastes that are the by-products of engineering infrastructures and usually invisible to the naked eye.

# Earth Day 1970: **Lee-Seville, OH** **Population: 1000, 98% Black**

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- “Slums and Pollution”—Chicago Defender Earth Day Editorial, “The choice isn’t between the physical environment and the human.”
- Zerubbabel Evans and Shirley Evans v. U.S. Housing Authority, Dept. of Housing and Urban Development and Cleveland Metropolitan Housing Authority and Mayor Carl B. Stokes
- “Health was endangered and would continue as long as the open sewers ... were not properly serviced.”

**Sewers Won't Wait: Robbins**

TED LACEY

*Chicago Daily Defender (Daily Edition) (1960-1973); Apr 16, 1970; ProQuest Historical Newspapers The Chicago De*  
pg. 8

# Sewers Won't Wait: Robbins

By TED LACEY

ROBBINS, Ill., officials are holding their breath because of their extreme sewage problem, but they said yesterday they aren't holding their breath until the federal government does something about it, as promised them yesterday by Robert Brown, special assistant to President Nixon.

Brown, accompanied by the Task Force on Aid to Disadvantaged Communities and representatives of local aid organizations, toured the south-suburban black village and told officials there "we've come here not just to make promises but to make things happen. President Nixon has told us he wants us to cut down on the talk and get on with the action. Robbins can expect tangible action in several areas in the immediate future."

Robbins, recently elected mayor Marion Smith, who guided two busloads of federal, state and county officials, local organization heads and newsmen on a tour of the greatly depressed village, said "I'm not so optimistic," about all the exposure. "We've had studies and more studies here for years but we never get any help. I'll be the most surprised person if we get anything from this one."

Brown said this study will be different because it is authorized by President Nixon himself. "This is the first time all the resources of the president and the White House are available for getting action.

"This is what the 'new federalism' is — making the government work for the people."

The major problems facing Robbins are four, as listed by the mayor: sewage removal, residential housing, employment and job training and local business and industrial develop-

ment.

The major problem is sanitation, Smith said. A year ago Robbins applied to the federal government for \$700,000 to correct a greatly inadequate sewer system and to extend existing Chicago water lines further into the village.

The sewer system is so bad, Smith said, that there is always raw sewage above ground in standing water in the many low places and ditches. Children play in this water, he said, and in fact yesterday morning it was reported that a woman contacted hepatitis from the extremely unhealthy conditions that exist there.

The standing stormwater cannot be drained off the land through the local creek because it is polluted, Smith said. To do so would bring penalties by the Metropolitan Sanitary District.

Housing is another major problem. Since Robbins is so blighted by existing slum housing, it is impossible to obtain financing for new housing, Smith said. Meanwhile, existing homes built 10 to 15 years ago under urban renewal programs are drastically overpriced, he added. Clear land may sell for \$1300 a lot, but the FHA says it is only worth \$900, so it won't make loans to build on it.

Because businesses and industry can't flourish there, Robbins' 9,806 residents must seek employment in neighboring communities if they want to work.

This aggravates another problem, that of extremely poor public transportation facilities, Smith said.

Smith pointed out a large leveled site at 139th and Claire "that was acquired eight to 10 years ago by urban renewal. It was designated for a shopping center," but financing could not be arranged.

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# Earth Day 1970: Robbins, IL 10,000, 98% Black

- April 21, 1970, Visit from Robert J. Brown, Presidential Special Assistant, "Task Force on Aid to Disadvantaged Communities"
- Water Drainage into public waterways ineffective
- Residents were contracting water borne hepatitis from water drainage problem



This machine, standing on one of Robbins' few sidewalks, pumps sewage from a low sewer into a higher one. Robbins Mayor Marion Smith (right) explained to Special Presidential Asst. Robert J. Brown that his village has already applied for government help in correcting such problems, but the government has as yet taken no action.

# Clean Water Act (1972)

- **(CWA) is the cornerstone of surface water quality protection in the United States. Primary objective is to sharply reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. Another broader goal is to restore and maintain the chemical, physical, and biological integrity of the nation's waters so that they could support "the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water."**
- **In the early years, EPA, states, and Indian tribes focused mainly on the chemical aspects of the "integrity" goal. Also earlier efforts focused on regulating discharges from traditional "point source" facilities, such as municipal sewage plants and industrial facilities.**

# Safe Drinking Water Act (1974)

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- The Safe Drinking Water Act was established to protect the quality of drinking water in the U.S. This law focuses on all waters actually or potentially designed for drinking use, whether from above ground or underground sources.
- The Act authorized EPA to establish safe standards of purity and required all owners or operators of public water systems to comply with primary (health-related) standards. State governments, which assume this power from EPA, also encourage attainment of secondary standards (nuisance-related).

# 1972 Clean Water Act & Minority Communities

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**In large parts of the country, catch and release is not for the fish's sake: [5 years ago] 48 states issued fish advisories covering 63,000 lakes, 325,000 river miles, all of the Great Lakes, and all of the Gulf Coast. That means that fish from those waters are not safe to eat in unlimited quantities.**

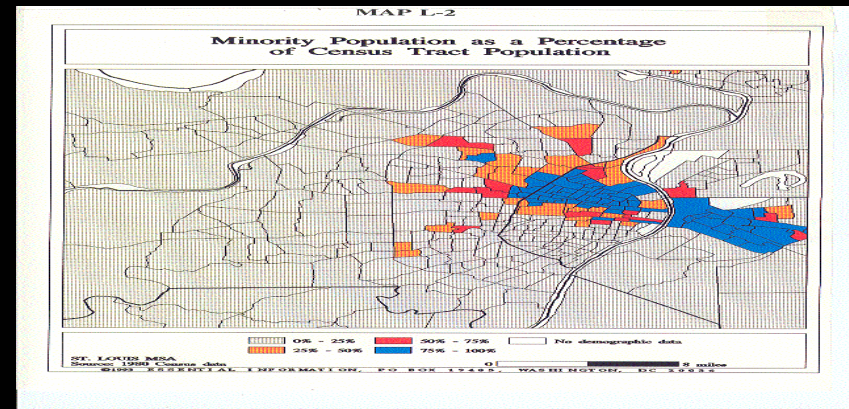
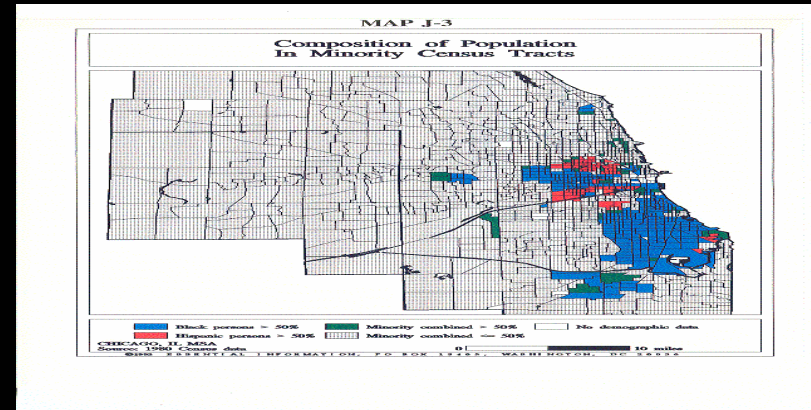
# *Katrina & Louisiana's "Cancer Alley"*

A Metaphor of The Historically Destructive Relationship Between  
Environmental Health Disparities, Engineering and Infrastructures



# Understanding Environmental Health Disparities Via Spatial Temporal Analysis of Engineering Infrastructures in the Urban Environment

- I. What is “spatial temporal analysis”? Why is it important (or should be important) to both historians and the public health community?
- II. How is it different from traditional methods especially in GIS applications?



NSF Award 639926 "Engineering, Infrastructures and Environmental Justice"

NSF Award 639926 Engineering, Infrastructures  
and Environmental Justice

*What is “ spatial temporal analysis”? Or...  
Why do we need an understanding space  
through time*

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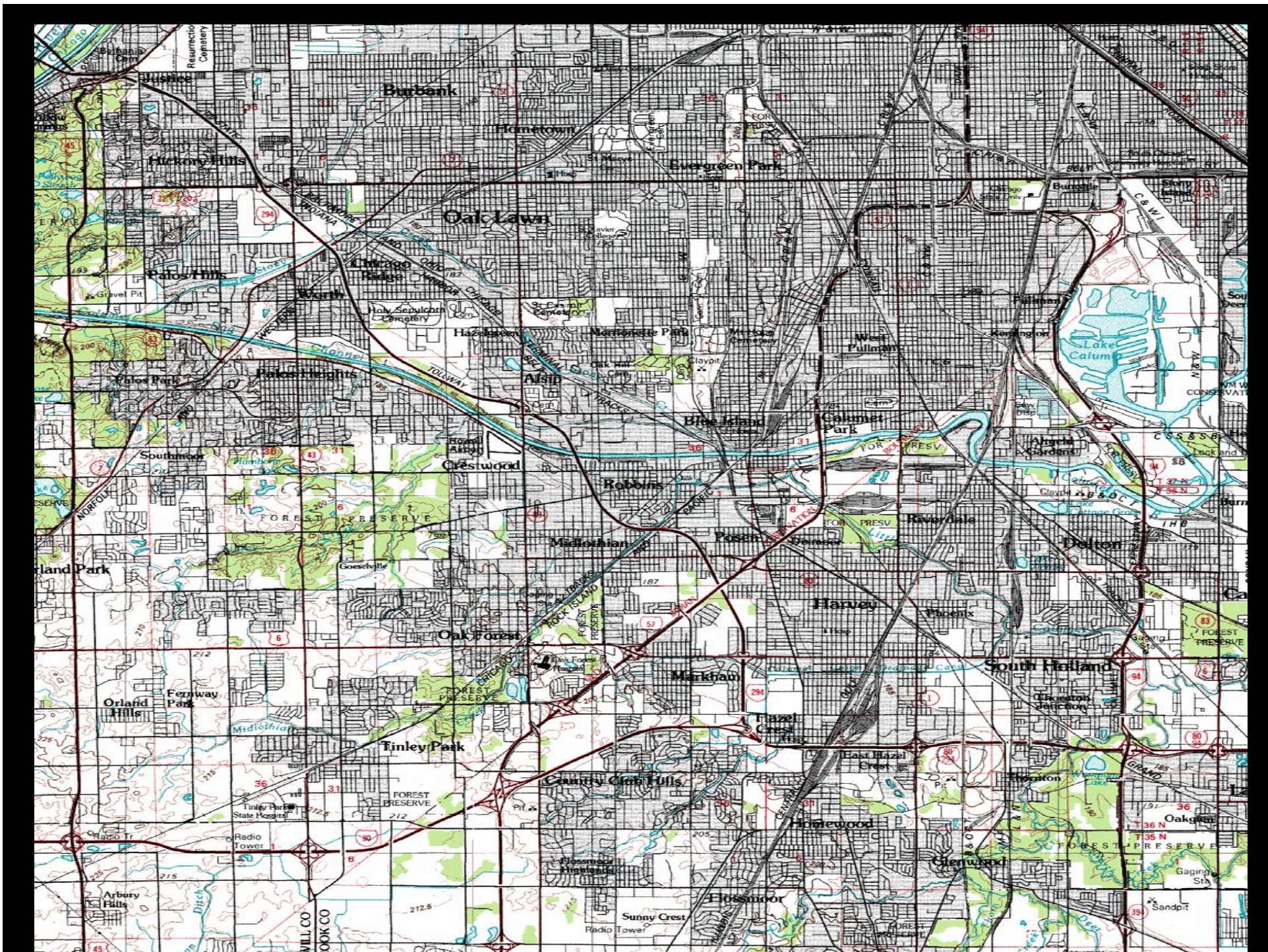
- To understand and tell the story of how an individual place developed
- To understand the complexity of the way different places develop
- To understand regional development and concomitant environmental health phenomena within varying spaces of the geographic region

# *How is it different from traditional methods especially in GIS applications?*

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**Spatial Analysis**: Manipulation of spatial data into different forms and the extraction of meaning from those forms.

1. ***Measurement***— i.e distance, length, perimeter, area
2. ***Topological Analysis***— adjacency, buffering, merging
3. ***Network Analysis***—connectivity, shortest path, routing, location-allocation
4. ***Surface Analysis***— filtering, viewsheds, watersheds, contours
5. ***Spatial Statistics*** – nearest neighbor, spatial interpolation, trend surface



# Robbins, IL



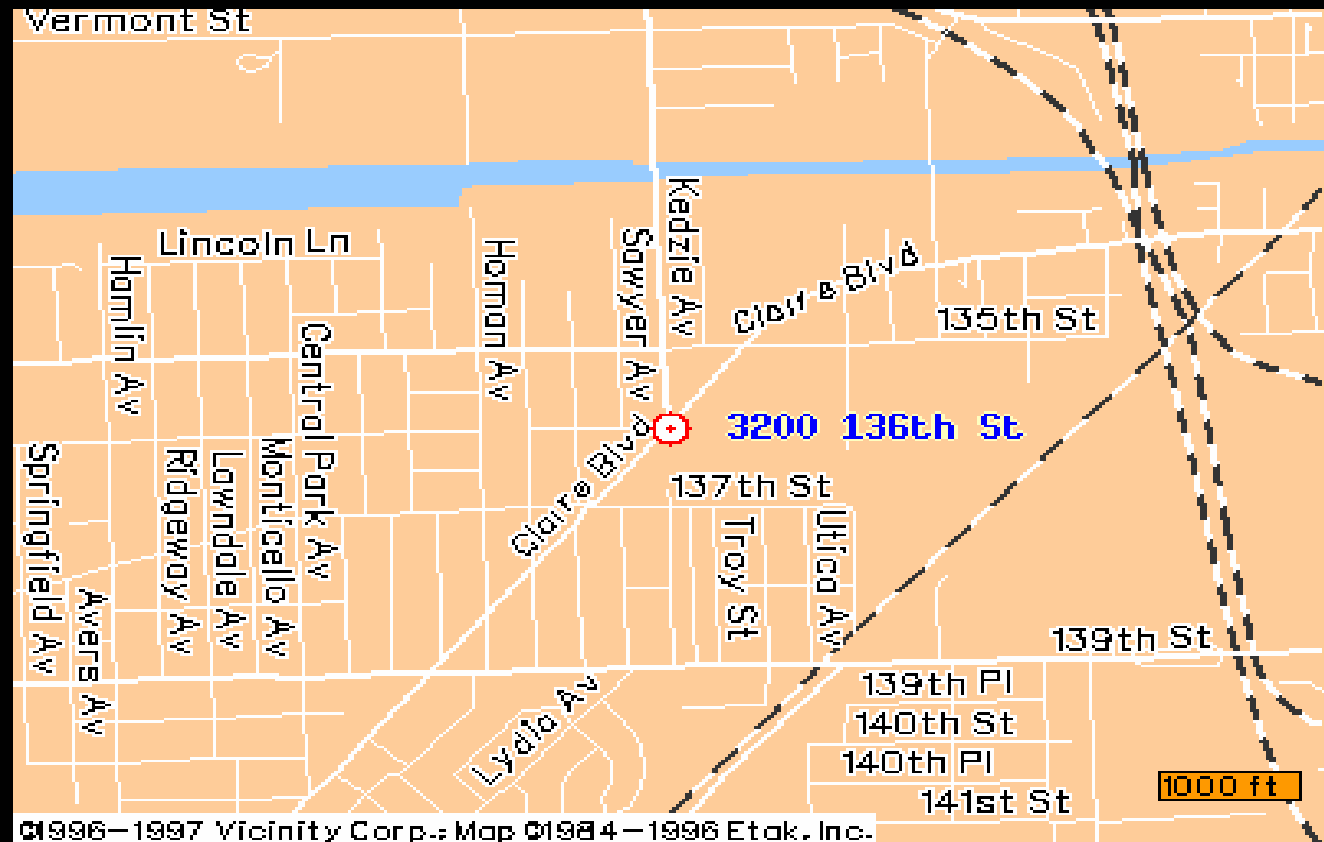
- (Left to right) State Rep. Robert Rita, Robbins Mayor Dr. Irene Brodie, Posen-Robbins School District Superintendent Gregory Wright and IEPA Director Doug Scott pose with a ceremonial check during a March 6, 2005 announcement in Robbins of a grant to the village for demolition and cleanup of hazardous structures.

# History of Robbins, IL

- **Land speculators predicted in 1892 that the city of Chicago would extend out here and all of the lots were sold to whites, who bought as a speculation on account of the World's Columbian Exposition in Chicago in 1893.**
- **In the spring of 1892, the first colored settlers moved in & Samuel Gaither was the first.**



There was a lull in the growth of settlement until H. E. Robbins opened his first sub-division in 1910. Between the 1911 and 1917 the village had more than 300 people living within its confines. With such a large population and no local authority to preserve law the village through incorporation.



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- ❖ **December 11, 1917. It was decided by the leaders that a few months training in the duties of self government was needed immediately speedily as possible.**
  - ❖ **A petition was filed with the county court asking for an election of village officials January 15, 1918.**
  - ❖ **Incorporated between 1917- 1920.**

# Chicago Commission on Race Relations 1922

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- “Village is the only exclusively Negro community near Chicago with Negroes in all village offices
- Homemade houses from tar paper and roofing paper; older homes have windows, doors, porches and fences
- 380 people (men, women and children) living in 70 homes.

# 1949 Chicago Cook County Survey

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- Had quadrupled in size since 1940 and contained the largest group of substandard housing in Cook County outside Chicago
- Considered a potential health threat by both public health and housing officials

*Based upon the 1946 Survey*

# 1946 Community Survey Report & Water Supply

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- Of 973 residences, 510 had city water, 44 had dug or drilled wells, and 419 had no water supply on the premises
- 48% of the residences in the incorporated community were without running water
- Attempt to finance a municipal water system twenty years earlier resulted in bringing water to only part of the town from Blue Island
- At certain times during the summer village is completely without water because of the heavy draft on the Blue Island system.

# 1946 Community Survey Report & Waste Water

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- Robbins had no municipal sewage disposal plant
- Of 907 toilets in the area, 286 were of the flush type and 621 or 68.5% were outdoor privies
- Effluent from cesspools and septic tanks was discharged to roadside ditches
- Limestone, less than 20 feet from the surface, made the area unsuited for subsurface disposal.
  - The few wells in the area were in constant danger of pollution from septic tank effluent and numerous privies.

# *Engineering, Infrastructure and Environmental Health Disparities*

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**Leaders of the environmental justice movement are... demanding improved health systems that recognize and take precautions to prevent negative health consequences and other effects of environmentally destructive projects.**

**The poor who bear the burden of unsustainable development are also urging the use and development of technologies and processes that avoid pollution and environmental hazards.**

Bullard, "Addressing Global Poverty, Pollution and Human Rights, *The Quest for Environmental Justice*, 2006