

Chicago Urban Flooding Resilience and Citizen Science

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1. Introduction

The Center for Neighborhood Technology (CNT) came to our STEP Water group with the goal of increasing their knowledge of citizen science and community science projects in hopes of enhancing their own initiatives in the Calumet region. Citizen science is “scientific research conducted by amateur scientists or members of a community.” Citizen science is sometimes described as public participation in scientific research.

CNT asked our group to create a best practices report based on the information we find from the work of other organizations. This material will serve as a resource for CNT in adapting their existing program and informing future citizen science projects.

This report will utilize knowledge from:

- CNT’s existing Urban Flooding Baseline program
- Community members in the Chicagoland area who have experienced flooding and are advocates for just stormwater solutions
- Other organizations who have conducted citizen science projects or participate in community empowerment and organizing.

Stakeholders:

- Center for Neighborhood Technology (CNT)
- CNT Advisory Board (Urban Flooding Baseline Program)
- Chicagoland community residents and citizen scientists
- Local community science programs and local stormwater management groups

2. Motivations

Finding solutions to urban flooding is a priority because it threatens people’s livelihood and wellbeing, particularly in communities of color.

Impacts:

- Transportation
- Work
- Food
- Water
- Shelter

This is a **global, national, and regional** issue.

For example: Cities lack permeable surfaces which creates poor drainage which is further exacerbated by climate change with increasing storms and outdated sewer systems. Additionally, some areas are built on natural floodplains, which affects the natural cycle of water.

Policy Level: Working towards solutions to urban flooding will help to achieve the United Nations Sustainable Development Goal 11: “*Make cities and human settlements inclusive, safe, resilient and sustainable*”.

Social level: We aim to address *inequities* in communities that suffer more disproportionately from urban flooding as well as amplify the voices of their citizen scientists and flooding victims through *conducting interviews*.

Our **long-term goal** is that the *evidence and research* we gather will be able to draw attention to these issues and gain funding or implement policies to create effective flood-resistant infrastructure.

4. Results

Our group has accomplished the following during the duration of this project:

Citizen Science Best Practices

The following information can be used by CNT in order to improve their own citizen science program. To increase participation and effectiveness of citizen science, the program goals need to be aligned with community interests. Citizen science can serve as a bridge between political and community activity, however, trust must be developed with the community in participation with elected officials. This includes the incorporation of cultural history within the project. Reciprocity and providing financial incentives has been shown to increase community involvement in citizen science projects in order to work around barriers such as transportation and financial viability.

Citizen Science and Public Policy

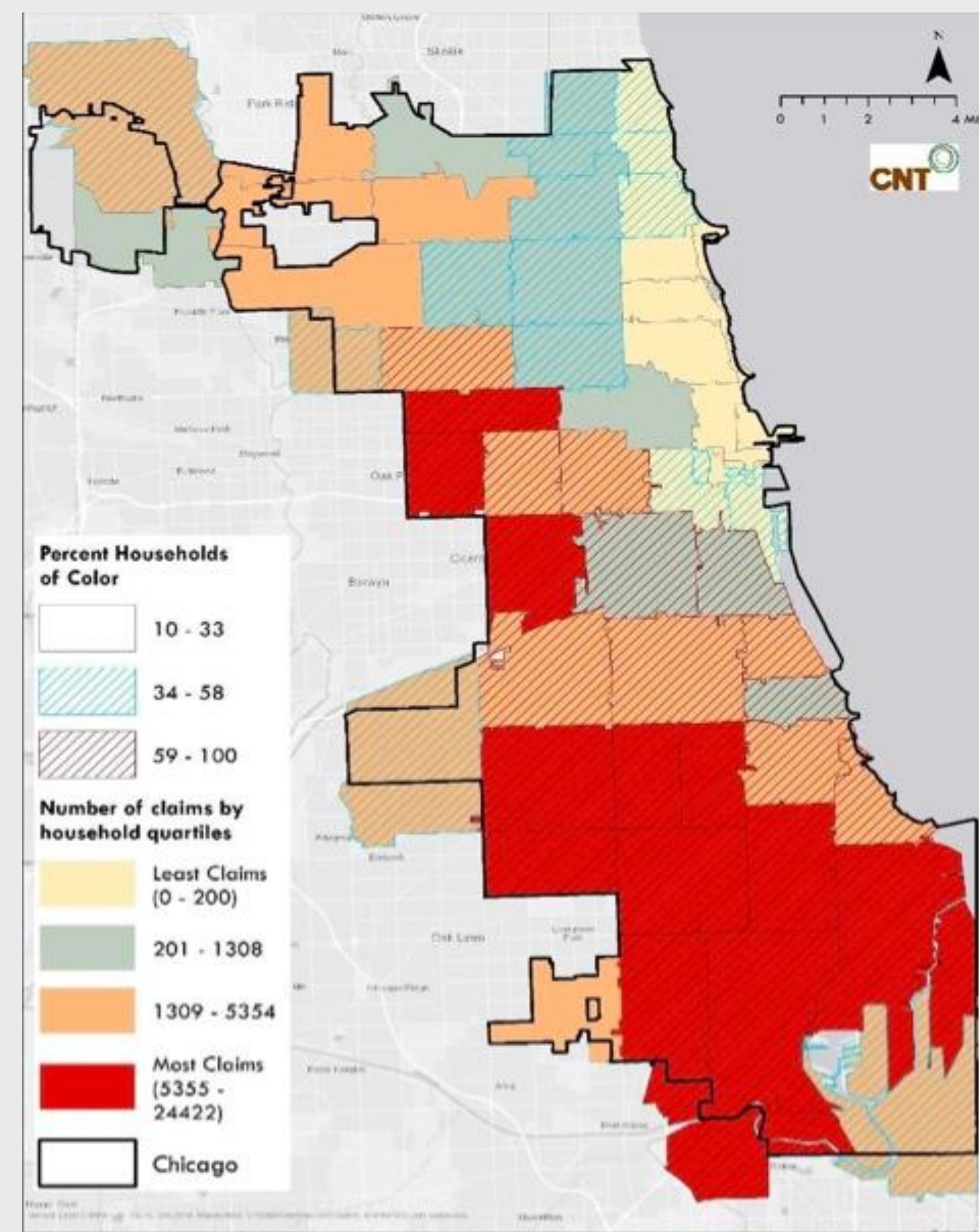
Our literature review analyzed at least 2 articles related to policy and decision-making by agencies on citizen science and have spoken with volunteers and community organizers with municipal experience and perspectives.

Floods on 147th St. in Midlothian



CNT, 2015

FLOODING CLAIMS BINNED BY QUARTILES OF HOUSEHOLDS – HIGHER IN COMMUNITIES OF COLOR



CNT, 2022

3. Methods

To study this issue, the researchers completed a literature review and conducted community interviews.

Literature Review: Compiled a list of various studies regarding citizen science projects around the United States, particularly ones whose focus is urban flooding. This literature review consists of over thirty sources, each with an 80-150 word abstract. These sources come from various studies in metropolitan areas, such as Los Angeles, California and Cincinnati, Ohio. Together, they demonstrate the work being done by other citizen science initiatives and potential areas of improvement for CNT’s Urban Flooding Baseline program.

Community Interviews: Conducted 9+ virtual interviews with individuals currently involved in citizen science programs and/or flood mitigation efforts. Gained insights into the citizen science volunteer experience, including their motivation to be involved, their current program’s assets and areas of improvement, and their thoughts on the issue of volunteer retention. Our group also gained insights into several policy-related issues related to urban flooding. Our group interviewed members of the following local and national citizen science programs: Illinois RiverWatch, the Calumet Stormwater Collective, and the Community Collaborative Rain, Hail, and Snow.

5. Discussion

Our review of literature echoes several views issued by interviewed participants. Firstly, community science efforts must engage and address community-identified needs and interests. And, elected officials and other organizations must actively support community based efforts in order to build community trust. However, many municipalities ignore community leaders for reasons such as uncertainty around data accuracy, costly procedures and other stakeholder interests. In this way, citizen science is important for redistributing power by building community knowledge and history, but communities are still viewed as unwanted stakeholders by local water management and government. For community science to reach its full potential, the community itself must be fully embraced by stakeholders. Going further, the implantation of community scientists and leaders within municipalities and water management systems would empower communities in the way elected officials were meant to be.

We encourage organizations with community science programs to acquire means to support their volunteers (e.g. funds for compensation, provide corporate and municipality connections, etc.) and expand community leaders roles within project management and communicate often with community members, especially those from less-represented groups.. Youth involvement is also a commonly overlooked source of knowledge and engagement and should be included.

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