

BEYOND THE FLOODPLAIN



OUTLINE



- Research, Cook County, IL and national
- Implications
- Action



OVERVIEW



- National non-profit
- Founded in 1978 + headquartered in Chicago
- Urban sustainability

RainReady services

- Launched 2014
- Complete 'end-to-end' service package
- Home, neighbor, community, watershed
- Information, financing, construction oversite



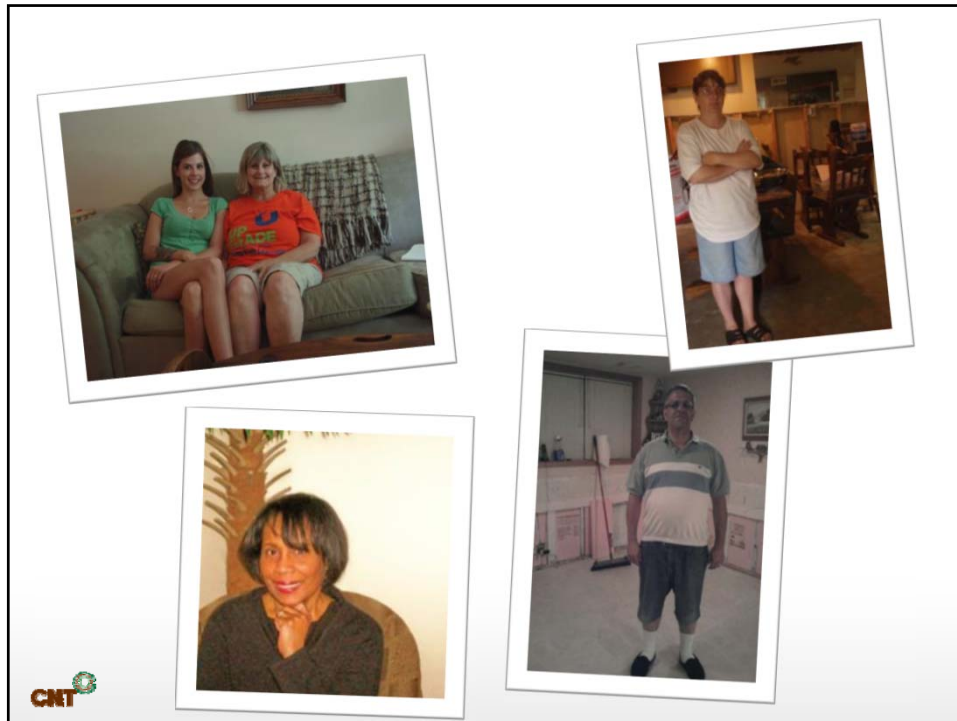
RESEARCH: FLOODING IN CITIES

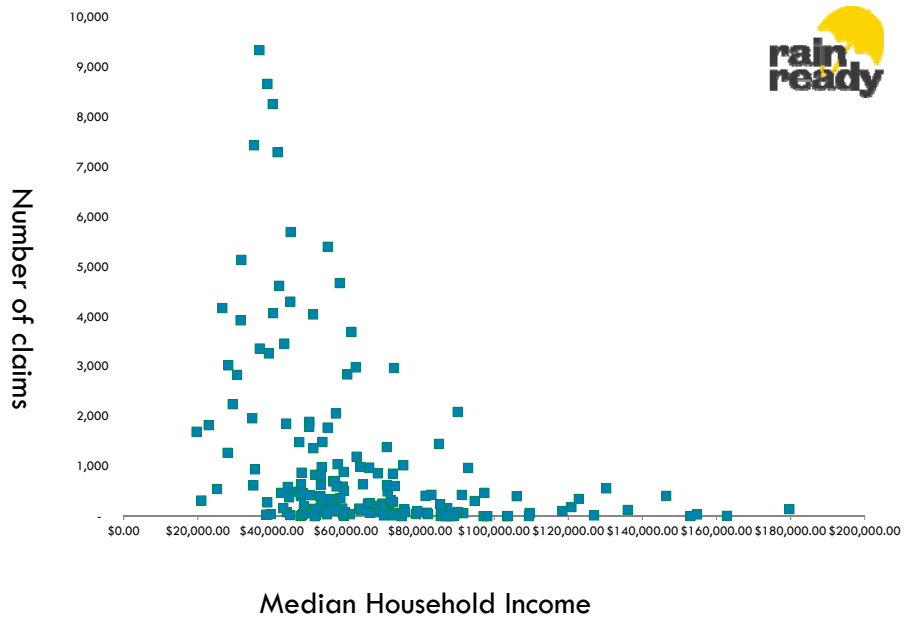
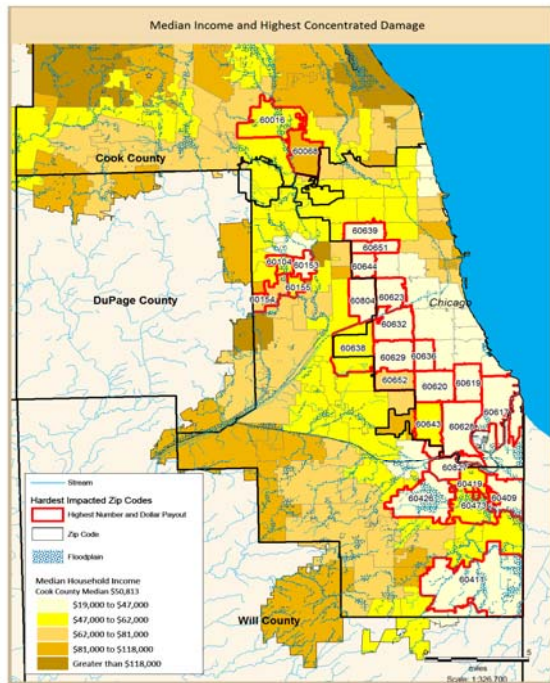
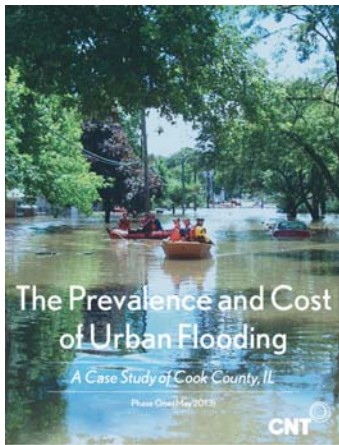


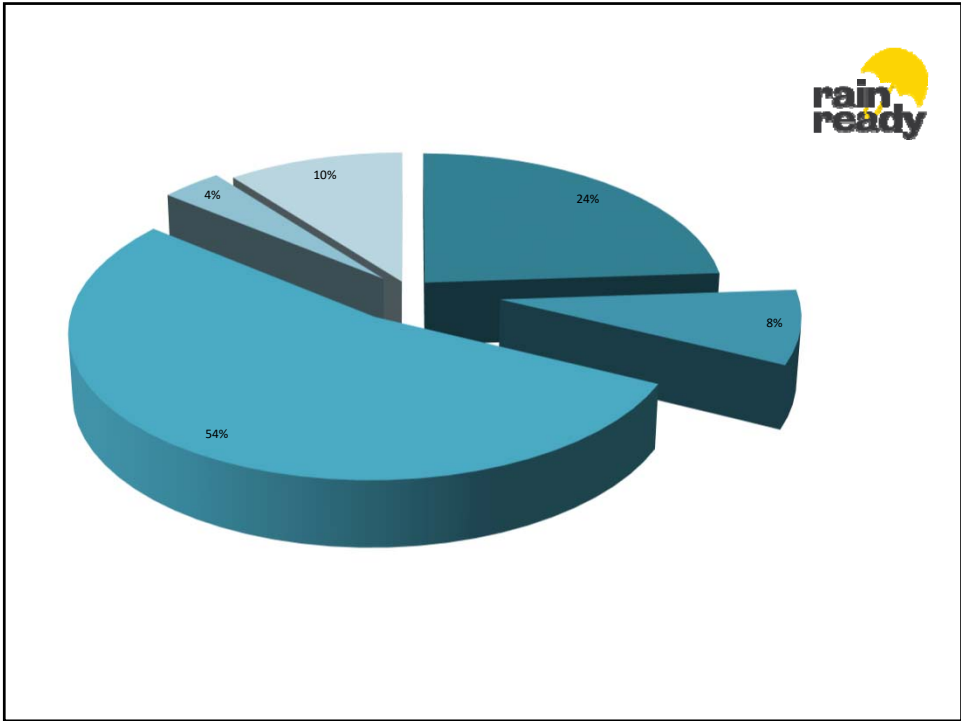
- **Qualitative interviews** with flood victims (2012)
- **Surveys** of flood victims (2013)
- **Analysis flood damage payout data** (2014)
- **Storytelling** “Gross Gatherings” (2013)
- **Surveys utilities/municipalities** (2014)
- **Analysis of flood warnings** in 10 major cities (2014)

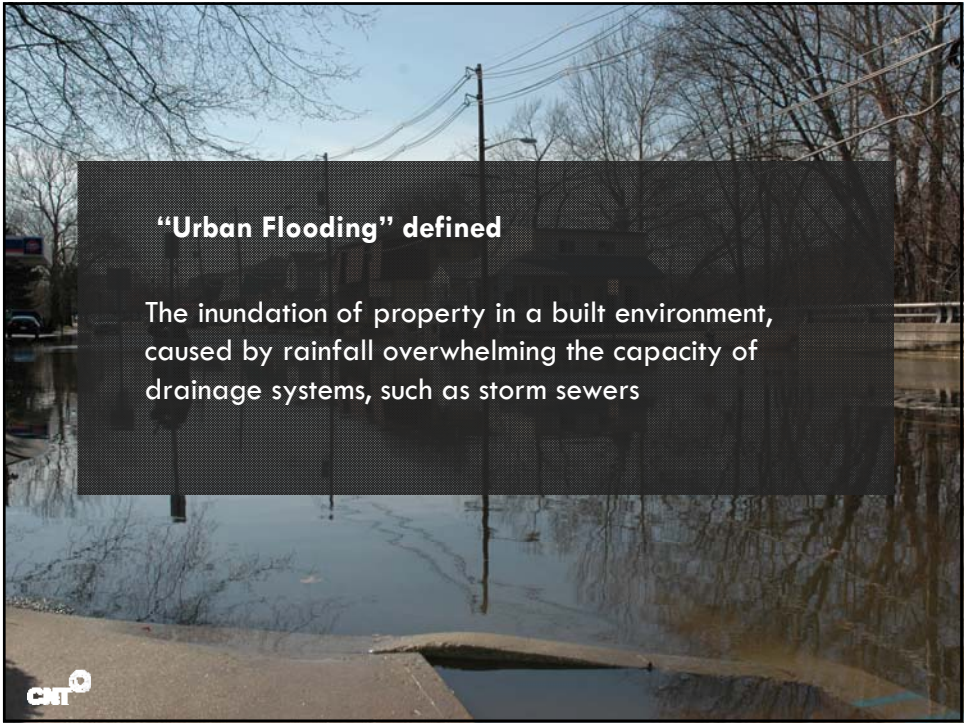
- Study: Illinois Department of Natural Resources (IDNR) (2015)
- Study National Academy of Sciences (forthcoming)





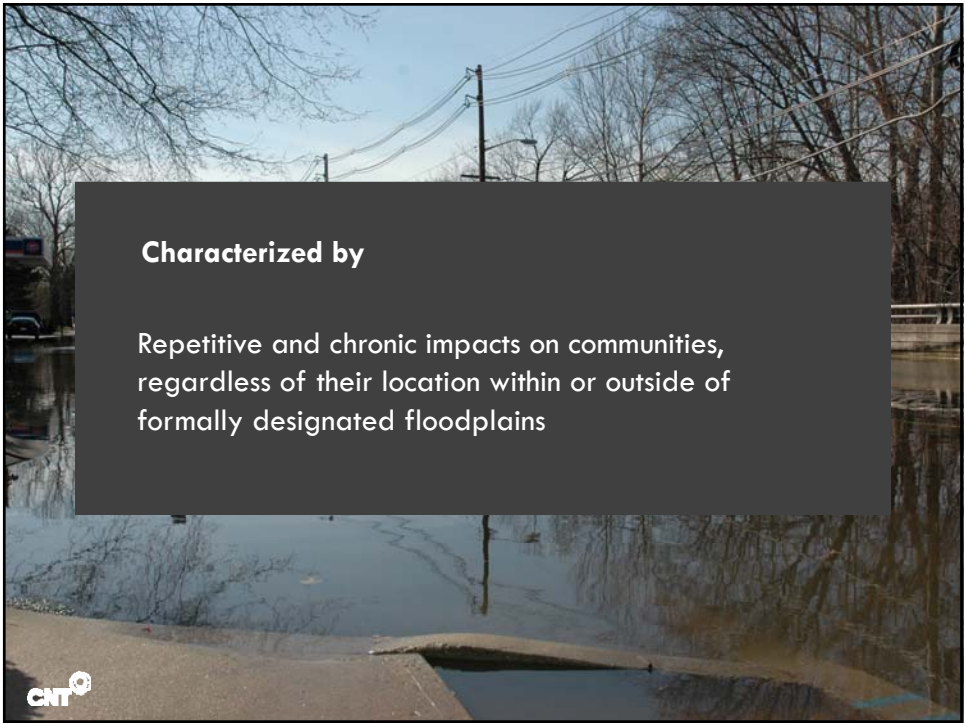






“Urban Flooding” defined

The inundation of property in a built environment, caused by rainfall overwhelming the capacity of drainage systems, such as storm sewers



Characterized by

Repetitive and chronic impacts on communities, regardless of their location within or outside of formally designated floodplains





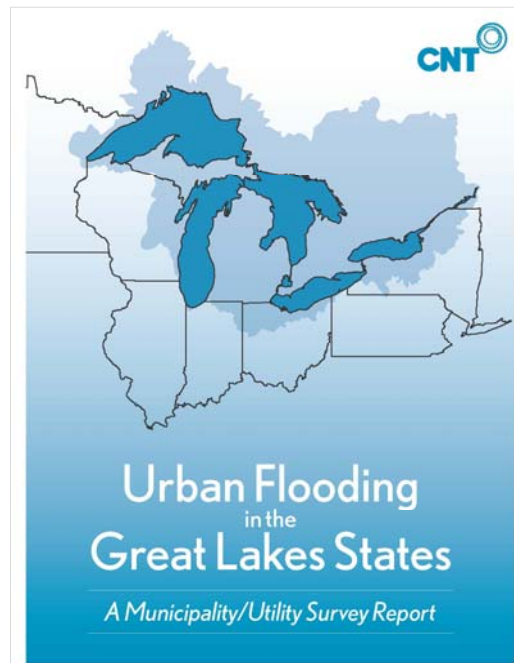
Overbank/creek

Sewer backup

Seepage

Yard and street

- **Survey of 30 most populous cities in Great Lakes region**
- 100% receive complaints
- 87% characterize them as 'medium' to 'large'
- Half have no plans for tackling it





Flooding in major U.S. cities

- Flash flooding warning: “imminent” or “in progress” between 2007-11 in the counties of 10 major U.S. cities



CHICAGO 198 flood warnings







HOUSTON 145 flood warnings



KANSAS CITY 192 flood warnings

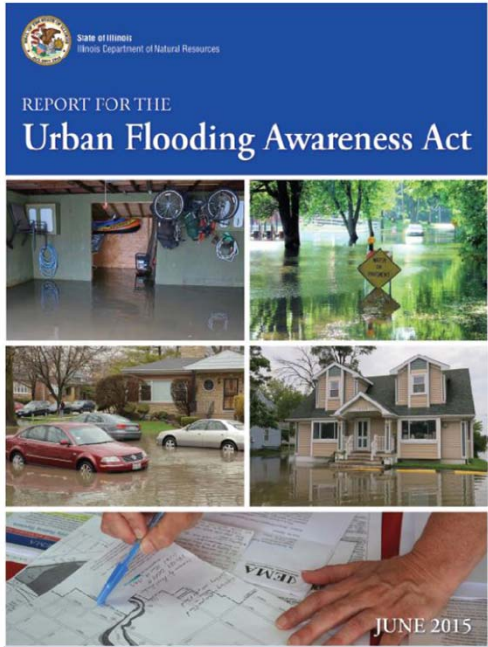




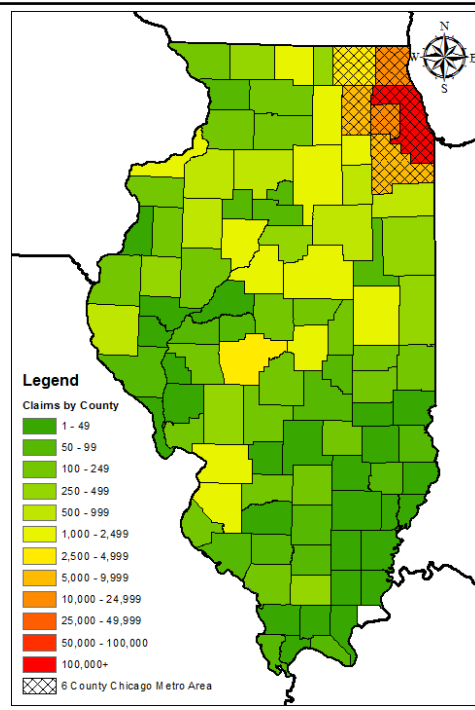




Urban Flooding Awareness
Act - Illinois



- Claims filed in 99% of Illinois counties
- Flood damages between 2007-2014, \$2.3 billion
- Half from private insurance
- **Over 90% outside of mapped floodplains**
- **Risk not correlated with the floodplain**



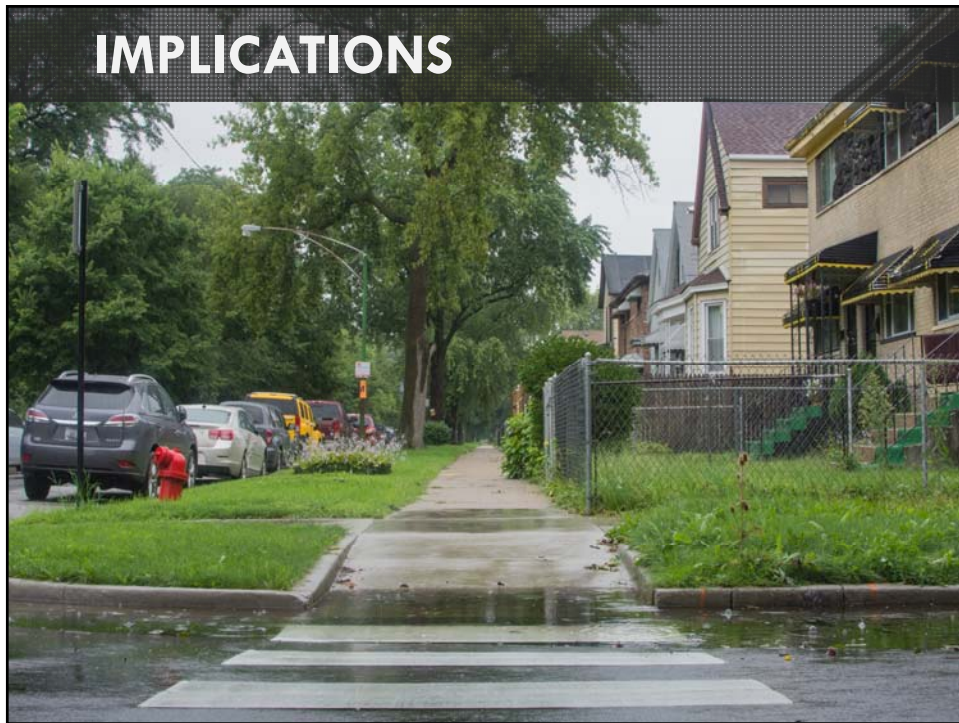
Flood risk in cities:

- Prevalent + repetitive
- Under-reported + hidden from public view
- Chronic: property damage, raw sewage, mold, foundation cracks, stress
- Expensive - \$5,000 +
- Low income communities most vulnerable
- Does not correlate with the mapped floodplain





National Urban Flooding Awareness Act



IMPLICATIONS



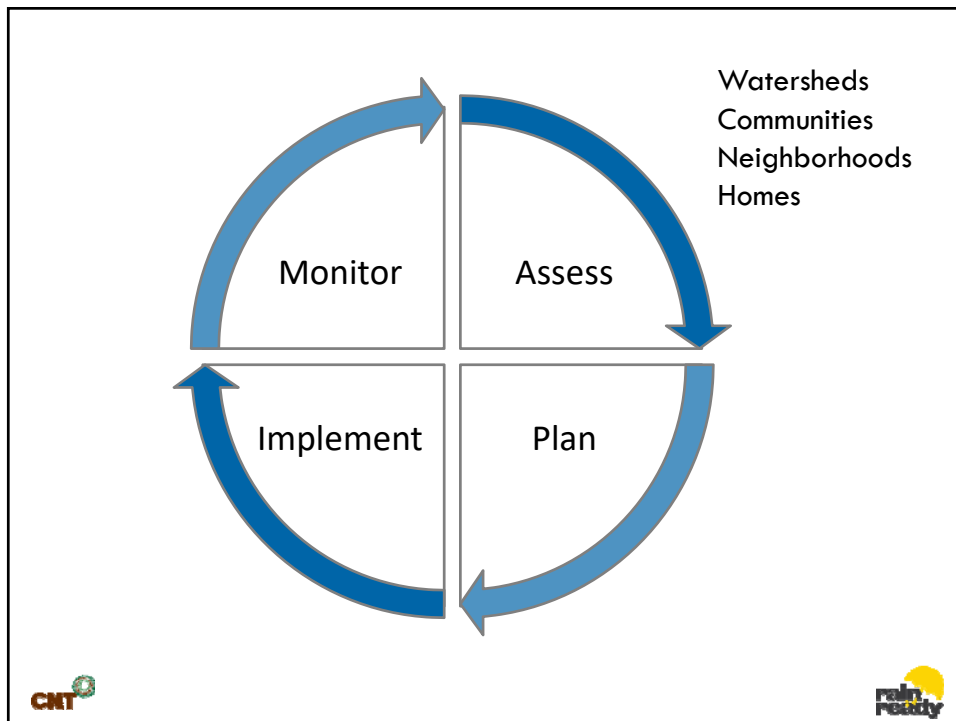
- The purpose of FEMA's flood hazard mapping is to define a community's flood risk areas
- It appears to be inaccurate (Illinois)
- Yet it forms the foundation of government's:
 - Emergency disaster planning
 - Federal mitigation efforts (NFIP/CRS)
 - State- and community-level responses
 - Flood insurance requirements and costs
 - Residents' understanding of risk



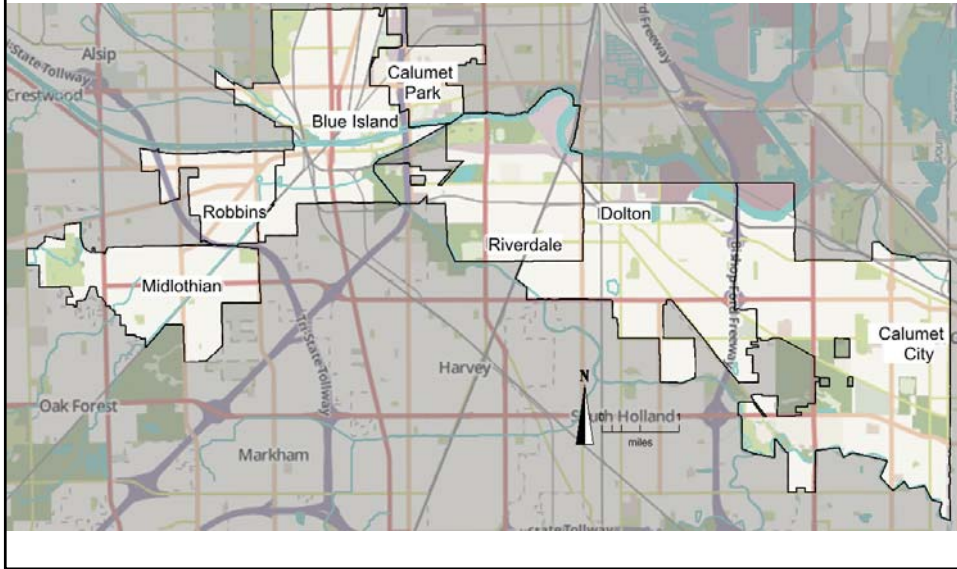
- National Academy of Sciences national study
- Use other factors that correlate with risk:
 - Intensity and duration of rain
 - Density of population
 - Poverty (location/maintenance/ability to respond)



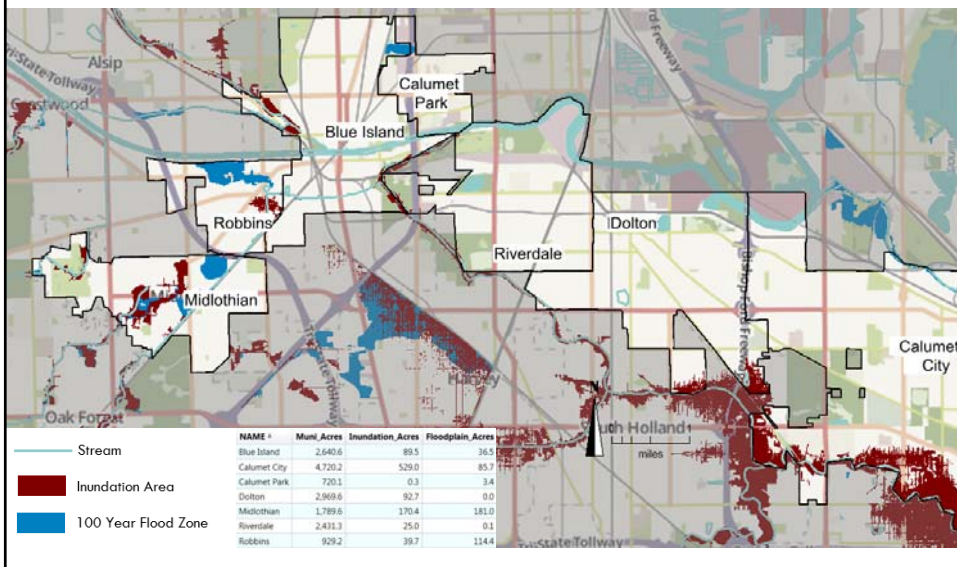
ACTION



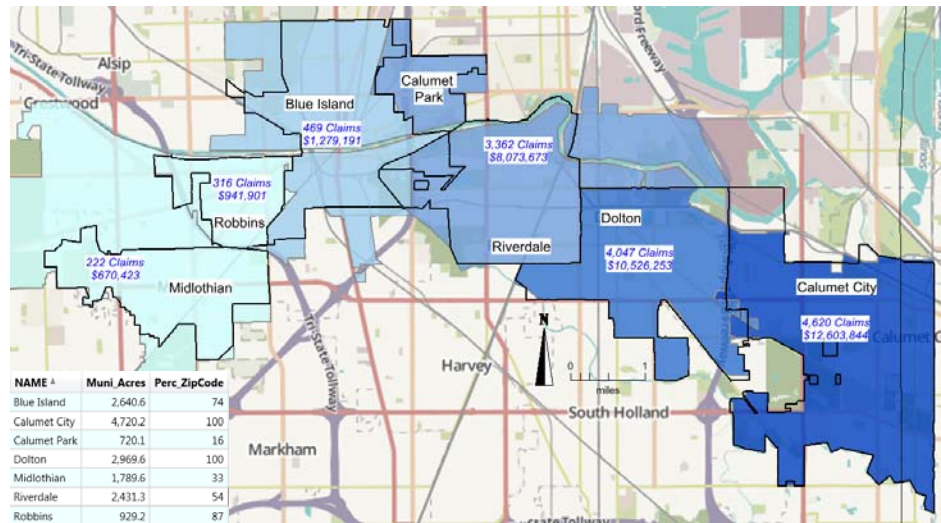
Project Area



Floodplains



Damage Claims



Map Risk: Problem Areas

Phase 1



Identified through prior risk assessments (e.g. NCRIC, HAVRD, Millennium Reserve) and stakeholder meetings



Problem Area

Map Risk: **Problem Catchments**

Phase 1




Identified through
prior risk assessments
(e.g. NCRRC, MFWRD,
Millennium Reserve)
and stakeholder
meetings


GMAP Stormwater
Analysis Tool Output

 Problem Areas  Problem Catchments

Map Risk: **Problem Points**

Phase 1




Identified through
prior risk assessments
(e.g. NCRRC, MFWRD,
Millennium Reserve)
and stakeholder
meetings

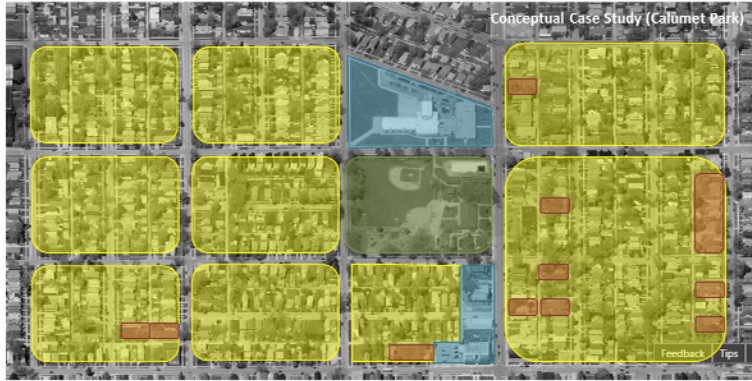

GMAP Stormwater
Analysis Tool Output


RRC Survey Results

 Problem Areas  Problem Catchments  Problem Points

Map Resilience Opportunities: **Land Use**

Phase 1



All Land Use Categories

- RESIDENTIAL
- COMMERCIAL
- INSTITUTIONAL
- INDUSTRIAL
- TRANS / COMM / UTIL / WASTE
- OPEN SPACE
- VACANT
- MIXED USE



Map Resilience Opportunities : **Concurrent Planning**

Phase 1



Types of Planning Processes

- Comprehensive
- Active Transportation
- Green Infrastructure
- TOD/COD
- Stormwater MGMT
- Etc..



Map Resilience Opportunities: **Assets**

Phase 1



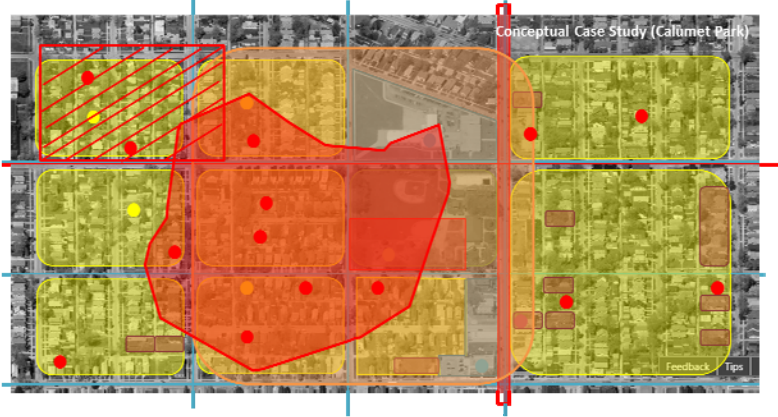
Map Resilience Opportunities: **Projects/Sites/Programs***



* This is the primary type of resilience opportunity that will be advanced through the RRC process.

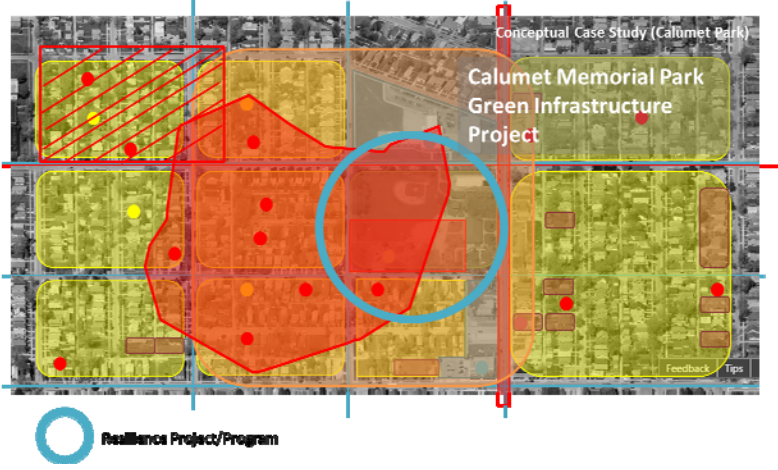
Map Risk + Resilience Opportunities

Phase 1

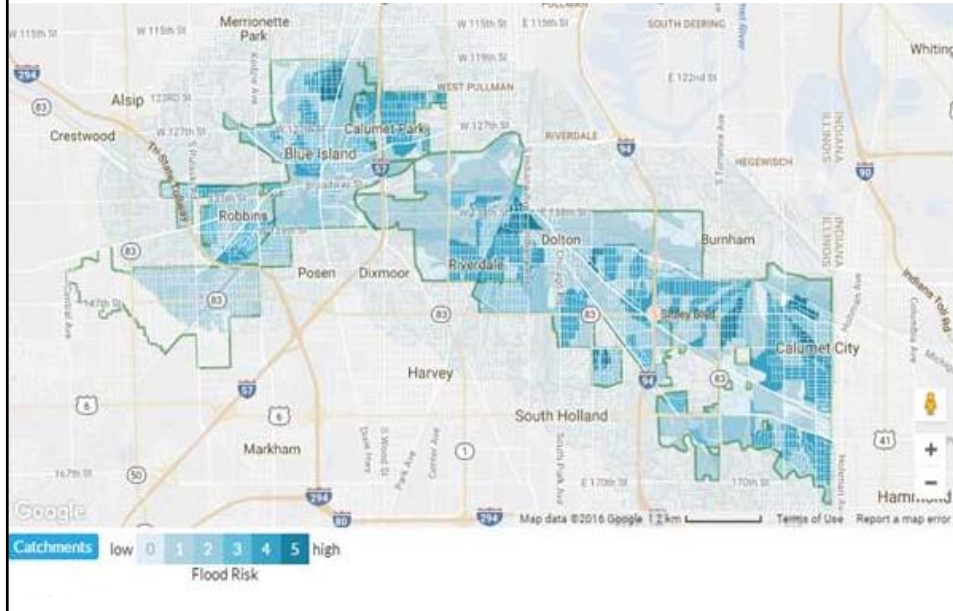


Collaboratively Design / Advance Resilience Projects

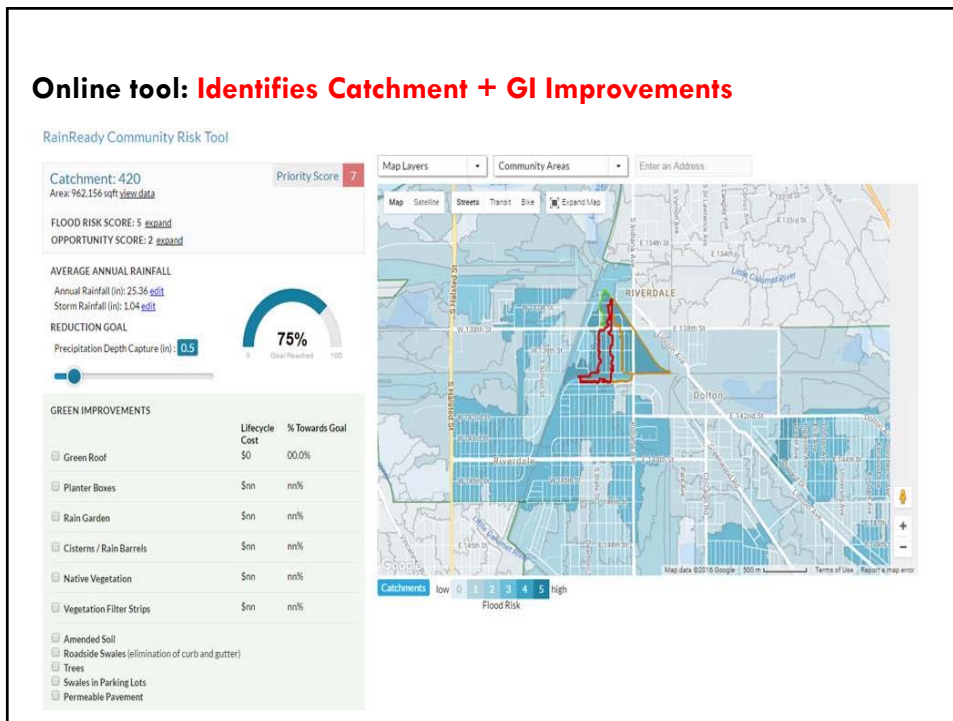
Phase 2



Online tool: Ranks Risk



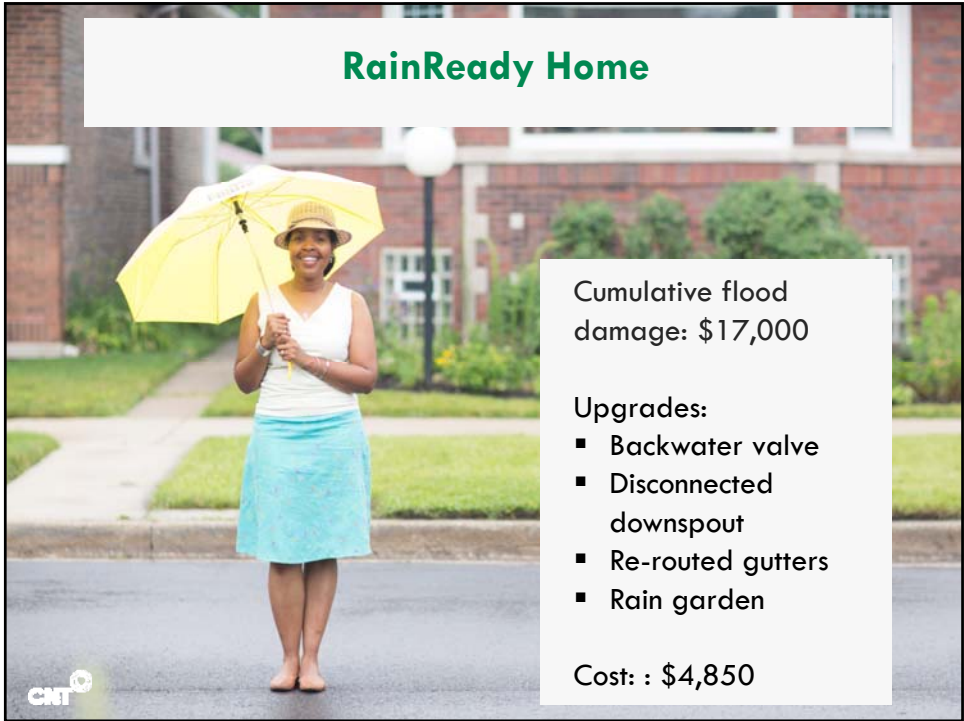
Online tool: Identifies Catchment + GI Improvements







RainReady Home



Cumulative flood damage: \$17,000

Upgrades:

- Backwater valve
- Disconnected downspout
- Re-routed gutters
- Rain garden

Cost: : \$4,850

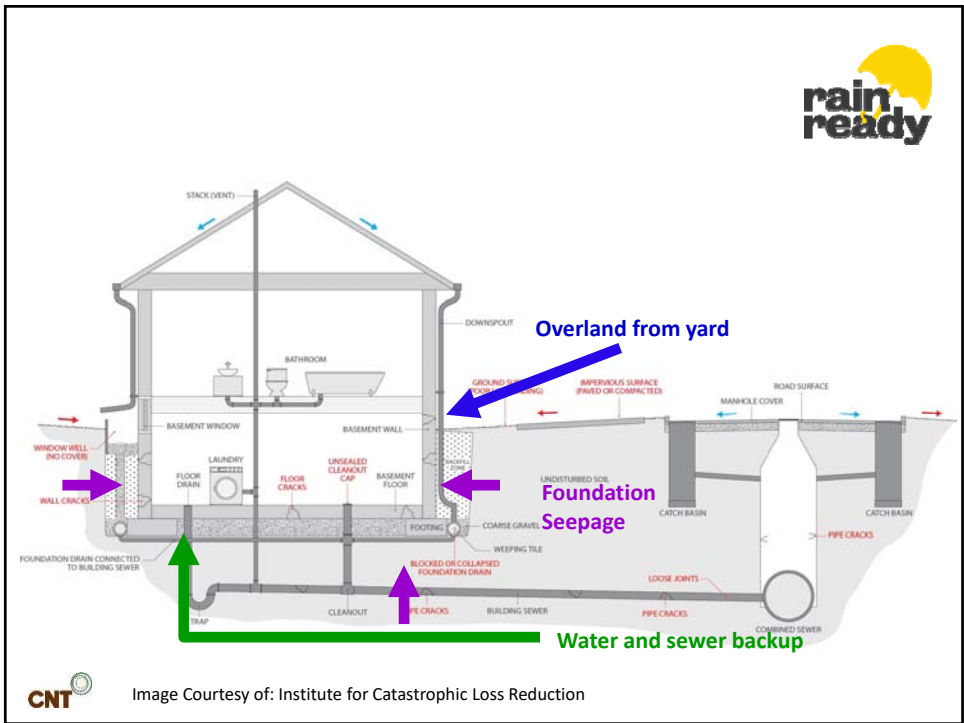


Image Courtesy of: Institute for Catastrophic Loss Reduction



- Detail of Risk
- Home improvements: landscaping, plumbing, building

Wetrofit® Flood Assessment Report

On April 22 and April 24, 2014, our Wetrofit team—Nick Furtak and Ryan Wilson—conducted a flood assessment of your property. Our assessment included:

- Collection of previous flood experiences
- Observation of the building foundation, basement and landscape
- Camera inspection of the building sewer,
- Observation of the adjacent properties and right-of-ways.

Based upon your experience with flooding, the cost of flooding in your neighborhood, and our assessment of your property, we recommend you prioritize the following Home Improvements:

1. Divert stormwater from entering property at alley.
2. Capture rainwater in landscape areas.
3. Drain flood water from sidewalk and under porch to catchbasin.

Understanding Your Flood Risk

Homes in the Chicago region are commonly affected by three types of flooding:

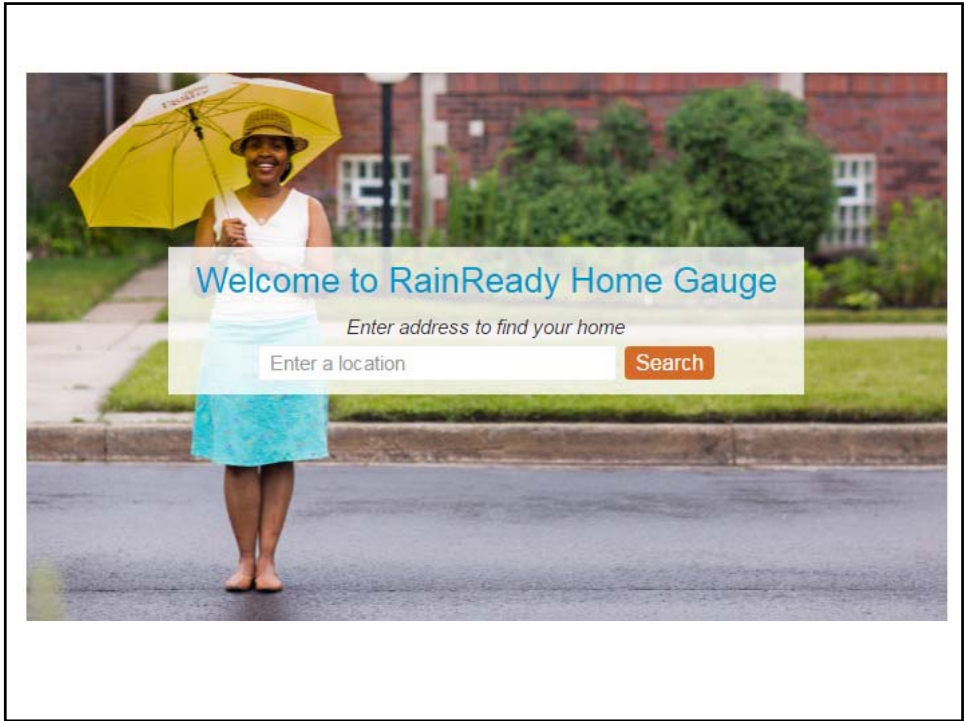
- Sewage backup that comes up from floor drains, sinks, tubs, and toilets in your basement,
- Water seepage through floors or walls, or flows through cracks in your building foundation,
- Overflowing of water that pools in your yard and against your foundation, or flows into your home through window wells and doors.

While considering the recommended improvements and maintenance, it is important to do so in the

Address: 911 S Claremont Ave
 City, ST: Chicago, IL
 Building owner: Margaret O'Neil

IMPROVEMENTS			Total Estimated Cost: \$5,000-\$7,300
Projects	Measure	Detail	
1. Divert stormwater from entering property at alley.	• Install curb (~3-4") along extent of eastern property line at edge of parking pad.	Anticipated Maintenance: N/A Cost Range Estimate: \$600-\$1,300 Optional: Reconstruction of existing stair. Notes: May require coordination with neighbors to ensure proper diversion.	
2. Capture rainwater in landscape areas	• Install rain garden with below-grade storage along eastern edge of patio. • Install permeable paving in place of existing patio area to drain to rain garden.	Anticipated Maintenance: Seasonal weeding and care of rain garden. Removal of debris for permeable surface. Cost Range Estimate: \$3,600-\$4,800	
3. Drain flood water s from sidewalk and under porch to catchbasin	• Clean and repair floor drain • Clean silt and debris from existing catch basin. • Install area drain from sidewalk adjacent to south façade to catchbasin	Anticipated Maintenance: Removal of debris contributing to area and floor drains. Cost Range Estimate: \$800-\$1,200	
MAINTENANCE			Total Estimated Cost: \$300-\$700
Projects	Measure	Detail	
1. Regular Building Sewer Inspection and Cleaning	• Televise building sewer • Rodding of building Sewer	Anticipated Maintenance: Annual televising and cleaning, as recommended by reviewing contractor. Cost Range Estimate: \$200-\$500/year Optional: Chemical treatment of drain to prevent root growth.	
2. Regular Gutter Cleaning	• Removal of leaf and organic debris from gutter.	Anticipated Maintenance: Annual televising and cleaning, as recommended by reviewing contractor. Cost Range Estimate: \$100-200/year	





Your Location Your Home Your Flood History

What year was your home built?

1957

Is there plumbing in your basement (e.g. a functioning sink or toilet)?

Yes No I don't know

Are there areas of your home that have efflorescence, mold, spalling or water stains?

Yes No I don't know



- Home tool
 - Virtual home assessment
 - Generate homeowner reports that:
 - Scores and cost risks
 - Lists and costs improvements

- Monitoring tool – ground-truths tool based on RR Home service
 - Assessment and survey data
 - Post construction satisfaction data
 - Post rain event surveys
 - Control group

