

Equitable Resilience Builder: An inclusive approach to addressing disasters and climate change

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What this afternoon will cover

Objectives:

Become familiar with ERB tool

Practice integrating qualitative and geospatial data to analyze equity and health

Get you set up to take the next steps in applying the tool in your work



Background and brief overview of ERB tool



Participatory mapping and storytelling



Strategize actions



Discussion and next steps

What is Equitable Resilience?

Resilience involves strengthening your community's capacity to prepare for, withstand, respond, adapt, and transform in the face of climate change, disasters, and other hazards.

Equitable resilience does so in ways that:

- Are culturally appropriate
- Are informed by local knowledge
- Use inclusive methods of making decisions
- Acknowledge differential vulnerabilities
- Address social and environmental inequalities
- Pay attention to the distribution of the benefits and costs of resilience





What is ERB?

A downloadable tool for inclusive resilience planning for disasters and climate change

Who might use it:

- State, county, municipal, Tribal, territorial agencies
- Emergency managers, environmental and public health departments, land use planners
- Community organizations

Use it to plan for:

- Climate adaptation
- Disaster resilience
- Hazard mitigation

It helps you:

- Engage with community groups and agencies
- Assess local hazards, equity, and resilience of social, built, and natural environment systems
- Identify and evaluate actions to take to support resilience in an equitable way

The tool provides:

- Guidance for collaborative activities
- A space to save and store materials
- Visualizations of results

ERB supports “all-hazards” resilience planning

Tribal environmental agency is doing a climate vulnerability assessment

Emergency manager is updating a county’s hazard mitigation plan

EPA Region 7 water engineer is assisting communities with green infrastructure and stormwater management





ERB centers equity in content *and* process

Outreach and engagement techniques

- Youth engagement guide
- “Centering equity” tips for each activity

Storytelling exercises











- Prompts for team meetings, community workshops
- Assessment begins with local knowledge and adds in scientific data
- Build relationships that support resilience

Indicator card sorting activity

- Participatory evaluation of resilience
- Use results to prioritize actions to take

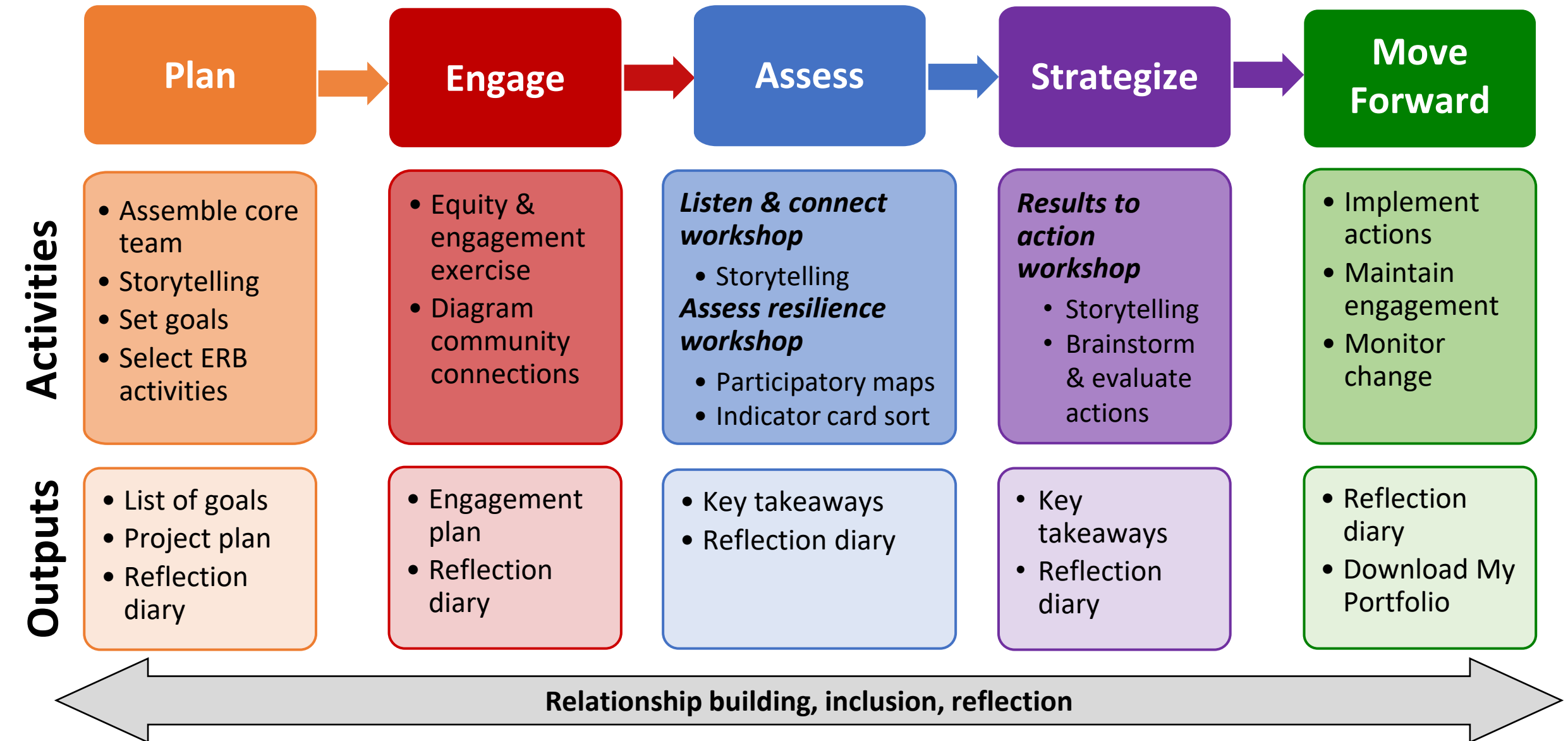


Centering Equity Icons

Icons	Theme	Icon	Theme
	Empathy		Trust
	Representation		Collaboration
	Networking		Voice
	Adaptability		Active Listening
	Vulnerability		Local Knowledge



ERB is adaptable and flexible



What communities get from using ERB



STRONGER
COMMUNITY
CONNECTIONS
AND NETWORKS



LEARNING
ABOUT
HAZARDS,
EQUITY, AND
RESILIENCE



ACTIONS AND
COMMITMENTS
TO IMPLEMENT
THESE ACTIONS



VISUALIZATIONS



DOCUMENTATION
OF THE
ASSESSMENT

Community Case Studies

Partners	Location	Local objectives
 Climate Resilience Consulting  	Grand Rapids, MI	Bring equity more centrally into watershed resilience plan
EPA Region 4  	Barnwell, GA; Aiken, SC	Build community around emergency preparedness
EPA Region 2, FEMA, NYS  	Buffalo, NY	Navigate recovery funding, learn about trauma-informed engagement

Grand Rapids case study: <https://storymaps.arcgis.com/stories/0f304067072d40a6a9d21f398902e990>

ERB Demo

2024 NACCHO Preparedness Summit



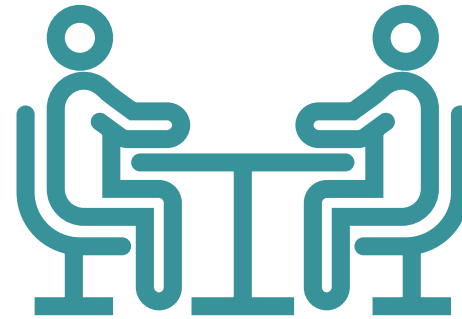
Next Steps for ERB

Rollout

- Trainings and workshops
- Coaching for community users (pilot)
- Evaluation and feedback

Research

- Enhanced features
- Additional content
- New applications of the tool





Background Context for Demo

- You are a local public health official tasked with engaging the Cleveland, OH community on their pressing physical and mental health concerns.
- You turn to ERB to find an interdisciplinary approach to evaluate the interplay of environmental factors, public health, and community resilience and experiences.
- Using adapted activities from the ‘assess’ and ‘strategize’ chapters of ERB, you will rely on both qualitative and quantitative data to understand the hazards and vulnerabilities in the community.
- Your focus will be to consider equity and sustainable resilience strategies for future climate hazards.



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Map of Cleveland Neighborhoods



Map source: <https://clevelandgis.maps.arcgis.com/>

Activity 1

Activity 1 – Preparation

- Break into 2+ groups
- Maps of 2 neighborhoods:
 - Lee-Harvard
 - Central
- Maps are labeled with:
 - Local hazardous/polluting facilities (regulated facilities)
 - Vulnerable sites (schools)
- Handout contains:
 - Instructions
 - Community Stories w/ indicators
 - Additional base layer maps

Activity 1 - Storytelling and Participatory Mapping

Steps

1. Read community narratives
2. Mark maps with all current:
 - a) Hazards
 - b) Vulnerabilities
 - c) Impacts
3. Circle any areas with future vulnerabilities
4. Identify top concerns, themes, and hazards

Ask yourselves:

- a. What are the top concerns of residents?
- b. What are the top hazards and vulnerabilities from the stories and data?
- c. What are the top equity concerns?
- d. Where are there “hotspots” or concentrated areas of hazards? Of inequity? Is there overlap?
- e. How will climate change influence these concerns and hazards? What are the potential future concerns?

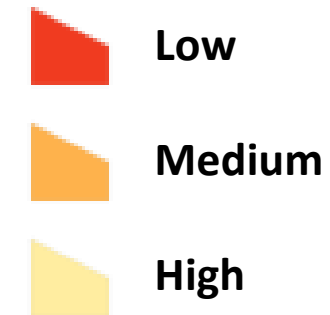
Cleveland

100-year Flood Plain

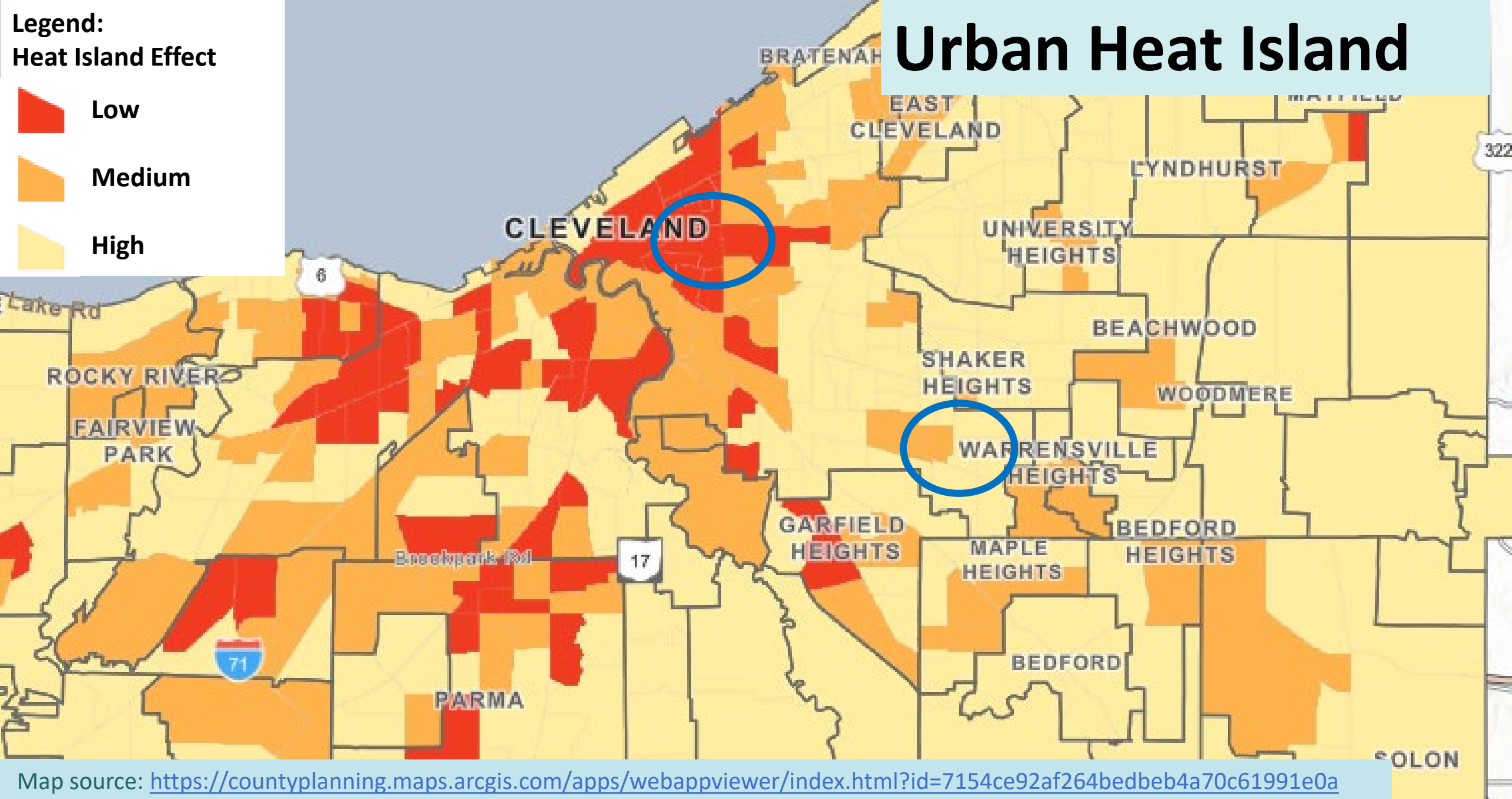


Map source: <https://ejscreen.epa.gov/mapper/>

Legend:
Heat Island Effect



Urban Heat Island



Map source: <https://countyplanning.maps.arcgis.com/apps/webappviewer/index.html?id=7154ce92af264bedbeb4a70c61991e0a>

Breakout Group Discussion Questions

1. Did you notice any patterns in where hazards are located and the locations of disproportionately impacted members of the community? Are specific community members being affected more?
2. How would a disaster compound or impact this area?
3. How did this spatial data relate to the concerns of the residents?

Activity 2



Activity 2 – Strategizing Actions

As a group you will now:

1. Identify 2-3 Action Areas
2. Craft Vision Statements
3. Brainstorm resilience actions
4. Vote on top 3 resilience actions
5. Report out to whole group
6. Whole Session Discussion Questions

Sample Actions Brainstorming Chart

Action Area #1	Flooding is severely impacting residents of Parkview neighborhood
Vision	In 10 years, the impacts of flooding should be reduced in Parkview neighborhood and residents should be better able to prepare for and recover from flooding.
Actions Brainstorming	
Infrastructure actions	<ul style="list-style-type: none"> • Raise the levy around the neighborhood • Improve the drainage • Install green infrastructure
Policy actions	<ul style="list-style-type: none"> • Offer buy-outs to residents who want to move • Provide recovery funding for damaged homes
Government actions	<ul style="list-style-type: none"> • Improve maintenance of drainage system so water doesn't back up • Offer training on flood-proofing homes
Household actions	<ul style="list-style-type: none"> • Residents can "adopt" a drain in front of their house to make sure it is clear of debris • Sign up for training on how to flood-proof your home
Community actions	<ul style="list-style-type: none"> • Form a volunteer group to clear drains of debris before rainstorms

Breakout Group Report Back

Activity Report Out

Each group report out on your Action Areas and Vision Statements.

- What influenced your identification of Action Areas?
- Which Action Area and Vision Statement did you prioritize? Why?
- What were the top 3 actions voted for?
- Share major themes that emerged during Activity 2

Open Discussion

- How would this tool enhance your practice?
- Are there other resources and guidance you think would support your engagement around equitable resilience?
- How did the intersectionality of community members' identities from the community stories influence how you thought about resilience in your neighborhood? How did this influence the actions you brainstormed?
- How did you prioritize actions to tackle social determinants of health or root causes of inequity?



Resources

ERB tool and user guide <https://www.epa.gov/emergency-response-research/equitable-resilience-builder>

ERB team and contributors

EPA Office of Research and Development: Keely Maxwell, Emily Eisenhauer, Susan Julius, Meridith Fry, Brittany Kiessling, Marissa Matsler, Lauren Oliver, Ian Reilly (ORISE), Maureen Shacklette (NSSC), Raven Nee (ORISE), Siena Henson (ORISE)

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Software development: Environmental Modeling and Visualization Lab/ ARA

Community case studies: EPA Regions 2, 4, 5, FEMA, NYS, Climate Resilience Consulting, Adaptation International, KLA

Additional reading

Fry, M., et al. (2023). Centering equity in the development of a community resilience planning resource. *Climate Risk Management* 40:100520. <https://doi.org/10.1016/j.crm.2023.100520>

Eisenhauer, E. and J. Finley. (2022). *Equitable Resilience to Flooding: A resource for practitioners on understanding economic, health, and social vulnerabilities and inequities in response and recovery*. Washington, D.C. EPA/600/R-23/214. https://cfpub.epa.gov/si/si_public_record_report.cfm?dirEntryId=359626&Lab=CPHEA

Maxwell, K. (2018). A coupled human–natural systems framework of community resilience. *Journal of Natural Resources Policy Research* 8 (1-2): 110–130. <https://doi.org/10.5325/naturesopolirese.8.1-2.0110>

EPA (2017). *Evaluating Urban Resilience to Climate Change: A Multi-Sector Approach*. Washington, D.C. EPA/600/R16/365F. https://cfpub.epa.gov/si/si_public_record_report.cfm?Lab=NCEA&dirEntryId=322482