

SOUTHERN ILLINOIS  
AREAWIDE WATER QUALITY MANAGEMENT PLANNING

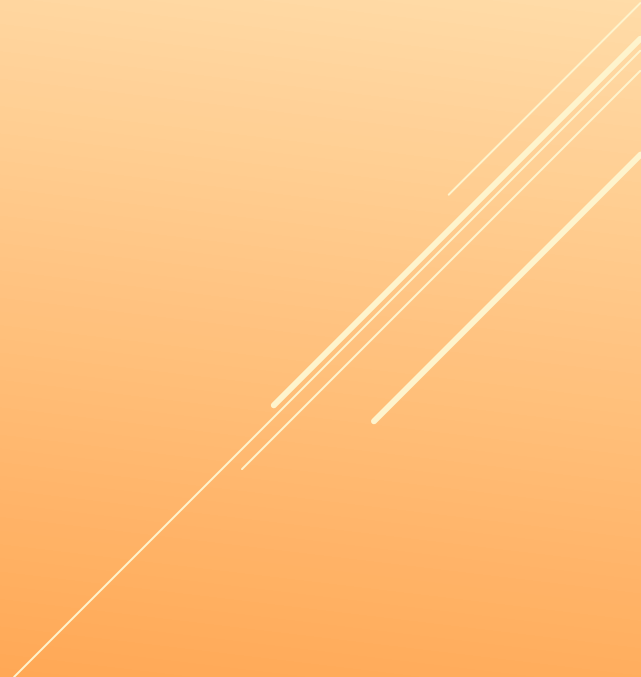
# **CARBONDALE URBAN HEAT ISLAND PILOT STUDY**

INFORMATIONAL MEETING  
DECEMBER 15, 2022 9:30AM



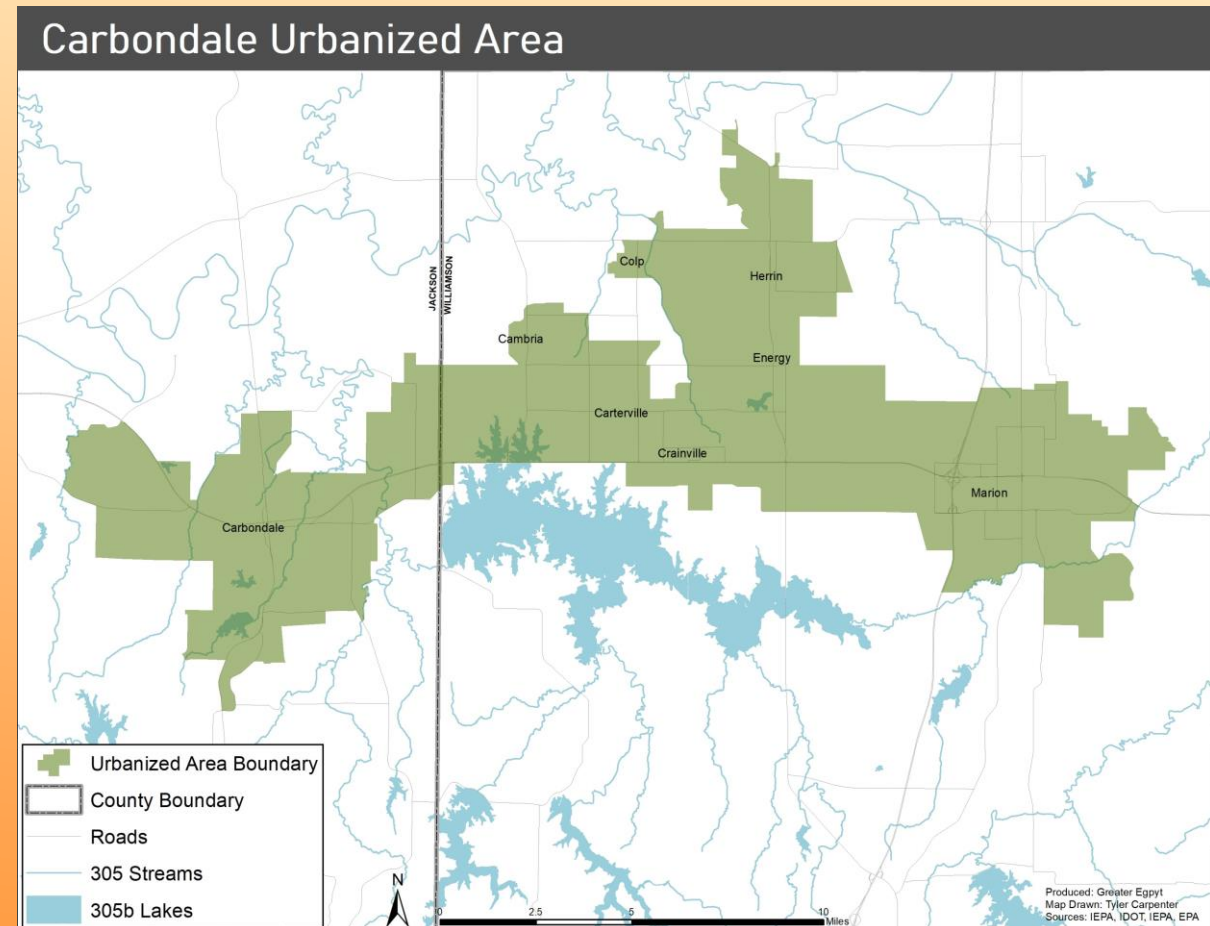
Greater Egypt Regional Planning and Development Commission

# 3 MAIN COMPONENTS OF GRANT

- ▶ Agricultural nonpoint source pollution study
  - ▶ Carbondale Urbanized Area UHI study
  - ▶ Stormwater & water quality education/outreach
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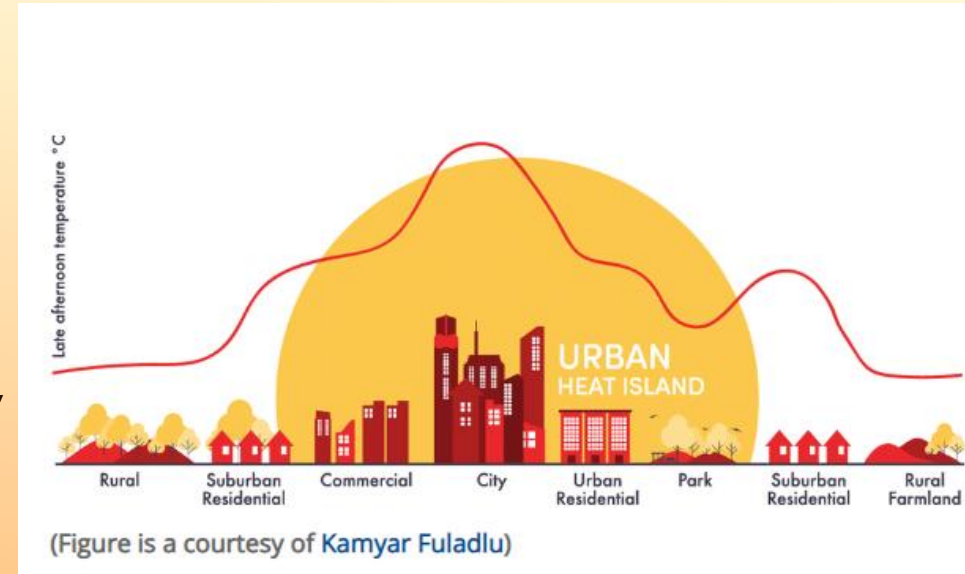
# CARBONDALE URBANIZED AREA

- ▶ Census Designated Areas with population of at least 50,000
  - ▶ 2020 Urban Areas to be released this December



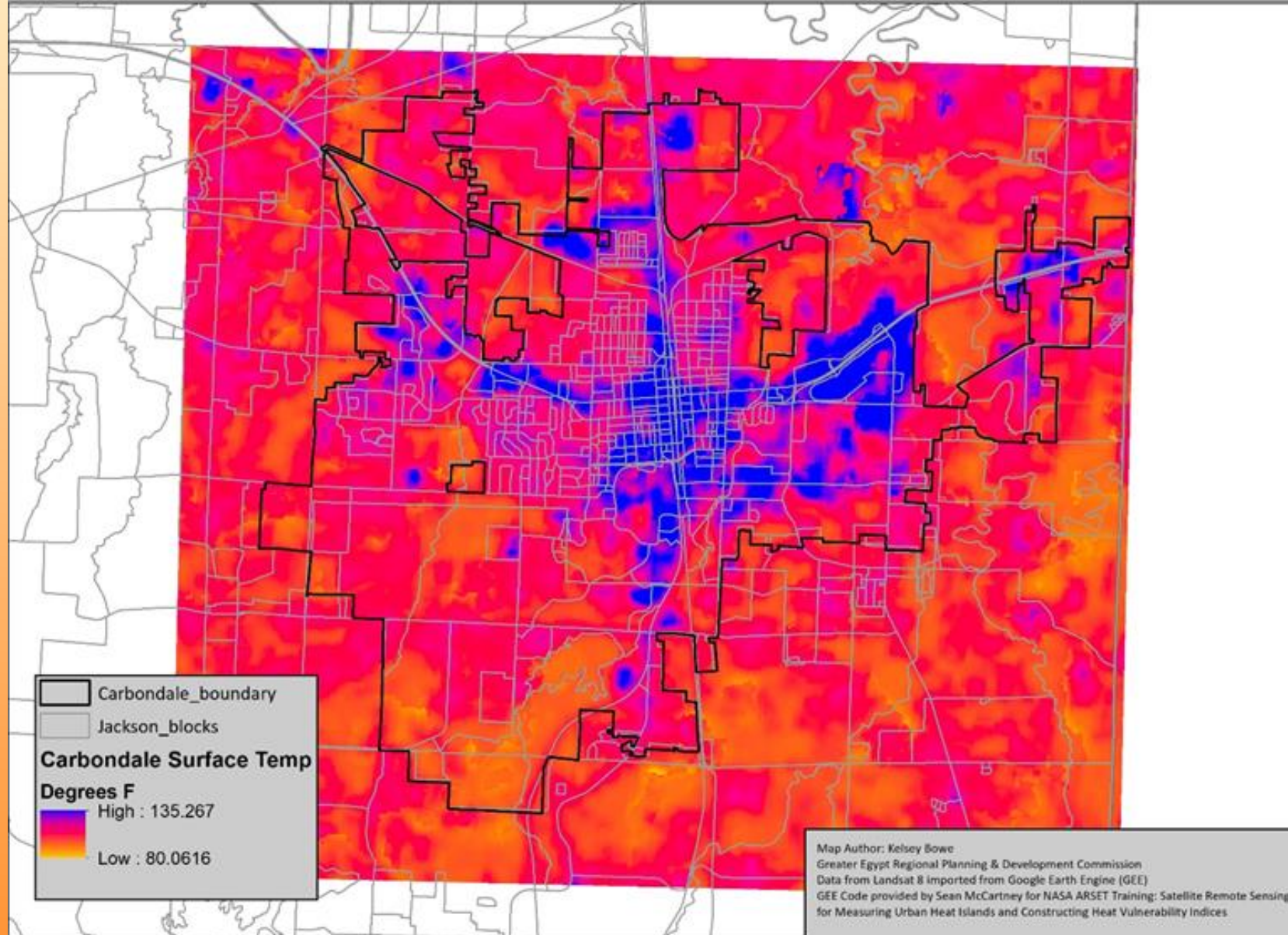
# URBAN HEAT ISLANDS

- ▶ Urban areas are hotter than natural landscapes
- ▶ Effects increase with climate change and urban density
- ▶ Can include:
  - ▶ Higher energy bills
  - ▶ Increased exposure to air pollution
  - ▶ Higher risk of heat related illness
  - ▶ Impaired water quality
    - ▶ UHIs often also have issues with flash floods and urban stormwater
  - ▶ Lower aesthetic value of city, less community pride

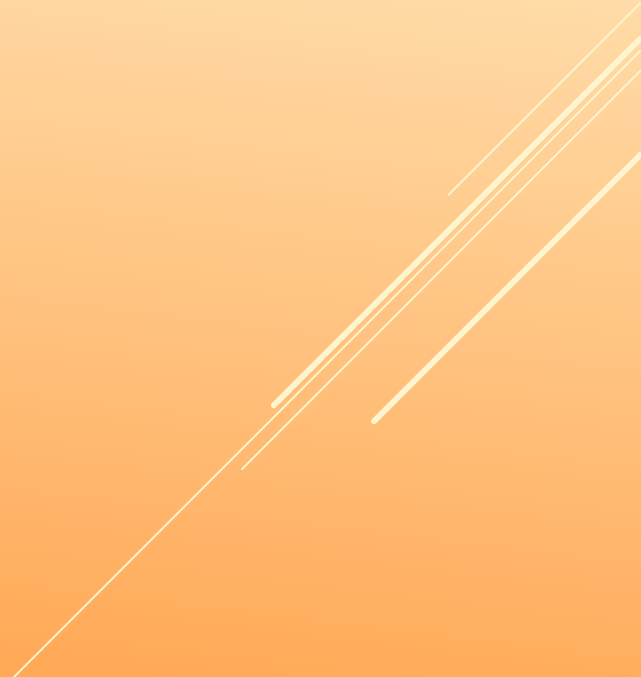


World Meteorological Organization

## Mean SurfaceTemp - July-August 2021 & 2022



# GOALS OF PROJECT

- ▶ Determine which areas have the highest UHI effects
  - ▶ calculate a Priority Index for the CUA
    - ▶ intervention goal of implementing green infrastructure and stormwater best management practices.
  - ▶ Procedures that can be applied to future studies
  - ▶ List of future mitigation projects
- 

# EXAMPLE INDEX SCORING

CAN BE ADJUSTED BASED ON PARTNER INPUT

- ▶ Index scores depend on the intervention goal
- ▶ Higher score = higher priority for intervention
- ▶ Can be weighted or unweighted

HVI Criteria	
<b>Canopy Cover (%)</b>	<b>Points</b>
80-100	0
60-80	1
40-60	2
20-40	3
0-20	4
<b>Landcover</b>	<b>Points</b>
Open water	0
developed, open space	3
developed, low intensity	3
developed, med intensity	4
developed, high intensity	4
barren land	3
deciduous forest	0
evergreen forest	0
mixed forest	0
scrub/shrub	2
herbaceous	2
hay/pasture	2
cultivated crops	1
woody wetlands	0
emergent herbaceous wetland	0
<b>Surface Temp (F)</b>	<b>Points</b>
87-93.37	0
93.37-99.6	1
99.6-105.83	3
105.83-118.29	4
<b>Pedestrian Infrastructure</b>	<b>Points</b>
bike path	1
no bike path	0
sidewalk	1
no sidewalk	0

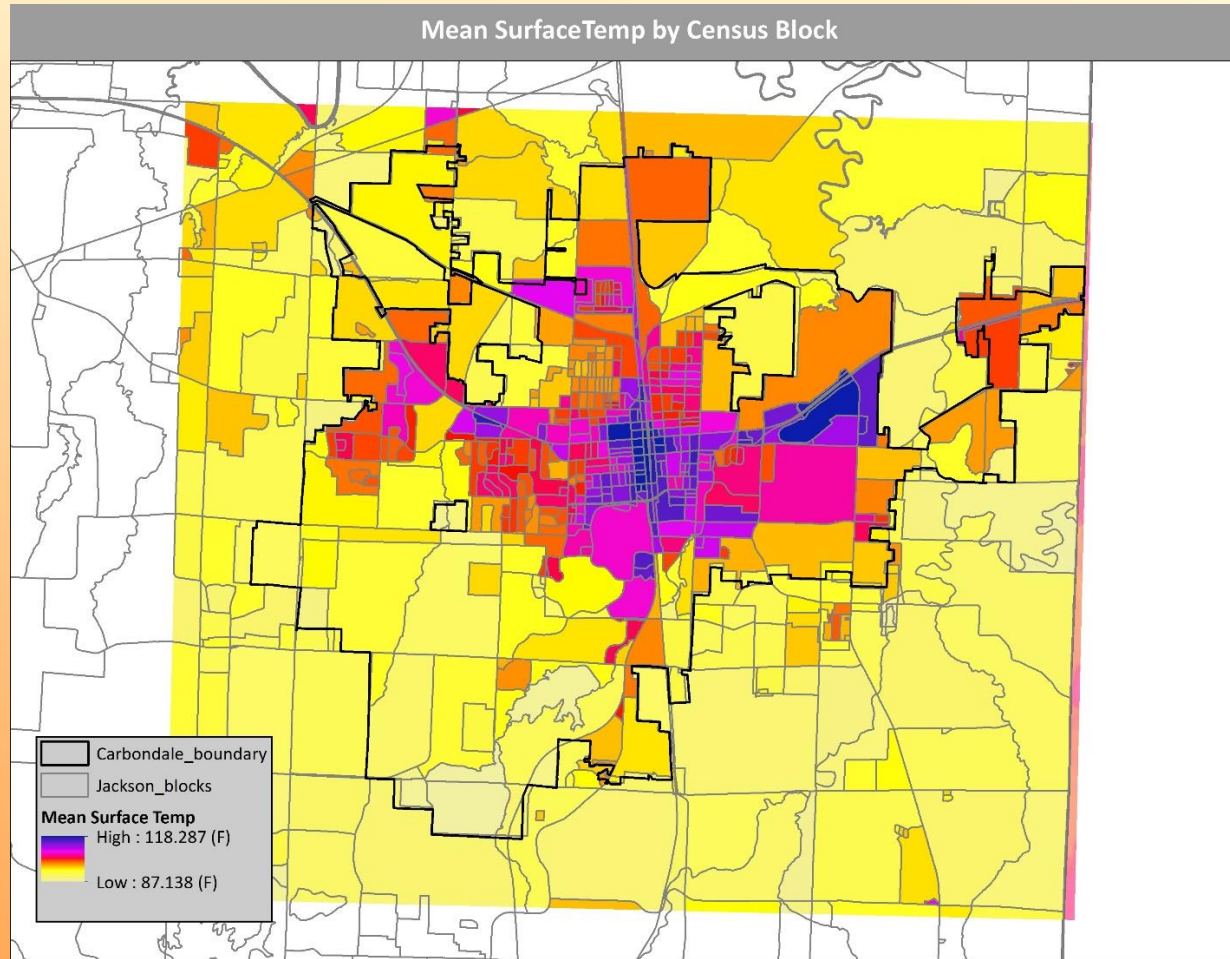
# SCOPE OF WORK

- ▶ Create raster files from national datasets
  - ▶ Surface temps
  - ▶ Canopy
  - ▶ Landcover
- ▶ Classify by Census Blocks
- ▶ UAS flights\* for detailed canopy cover
- ▶ Create scoring criteria for a Green Infrastructure Priority Index
- ▶ Regular meetings with Planning Group

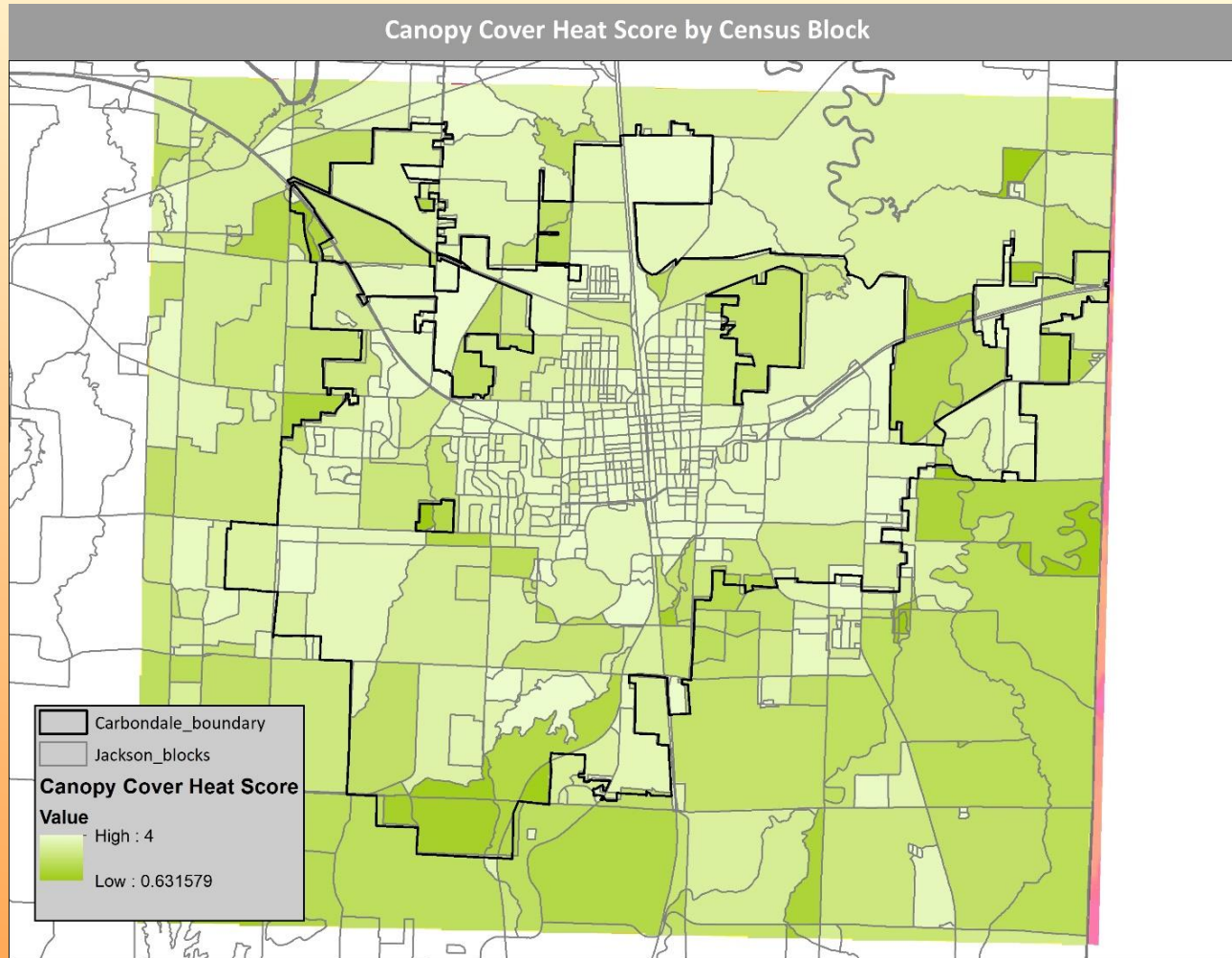


# PLANNING GROUP ROLES

- ▶ Assist in creating score criteria
- ▶ Provide knowledge of neighborhoods and current measures that combat UHIs
- ▶ Provide knowledge of areas that are suffering from UHI effects
- ▶ Determine where UAS surveys should occur
- ▶ Come up with project ideas for priority areas, assist in future grant apps

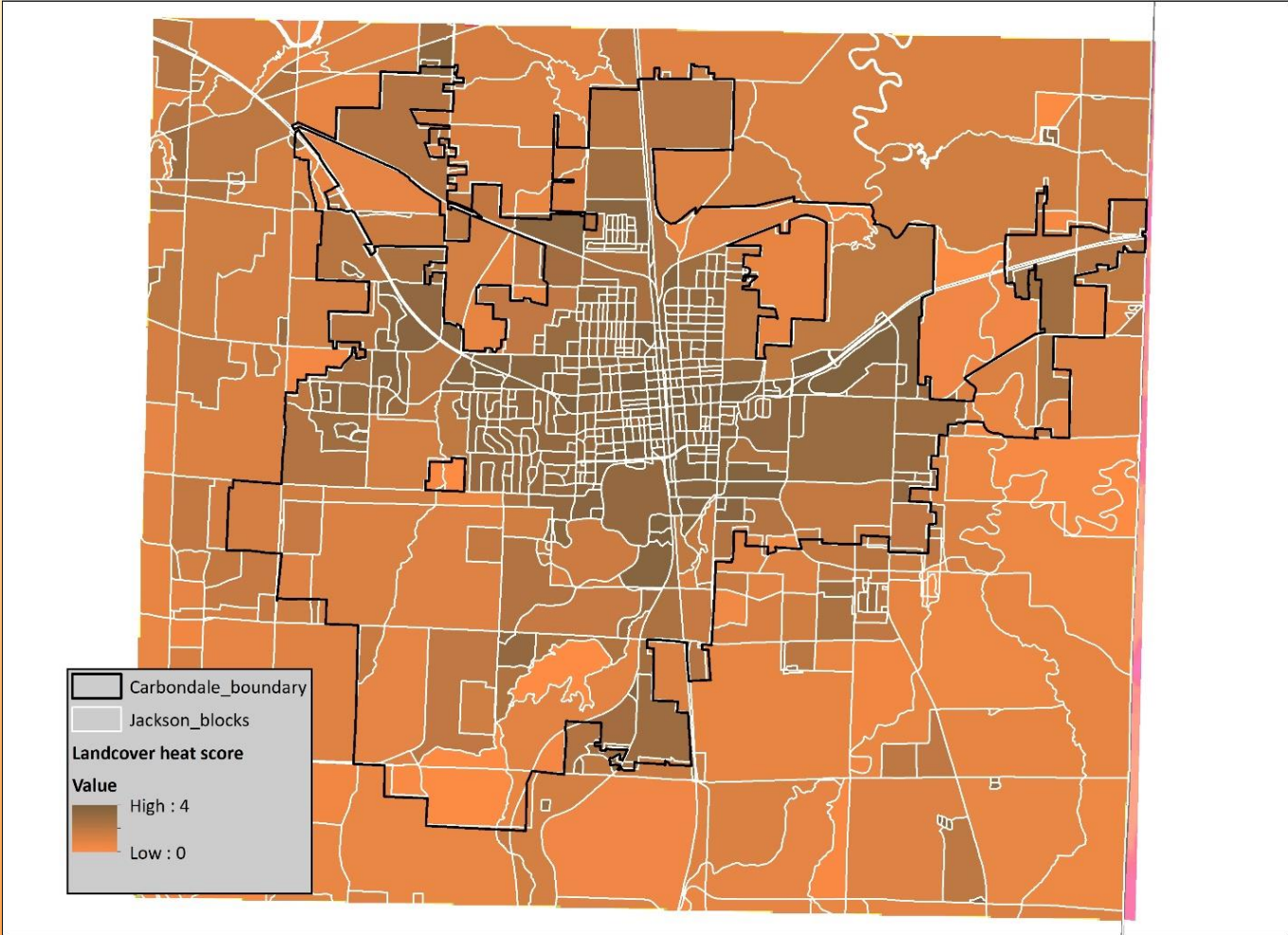


EXAMPLE OUTPUTS

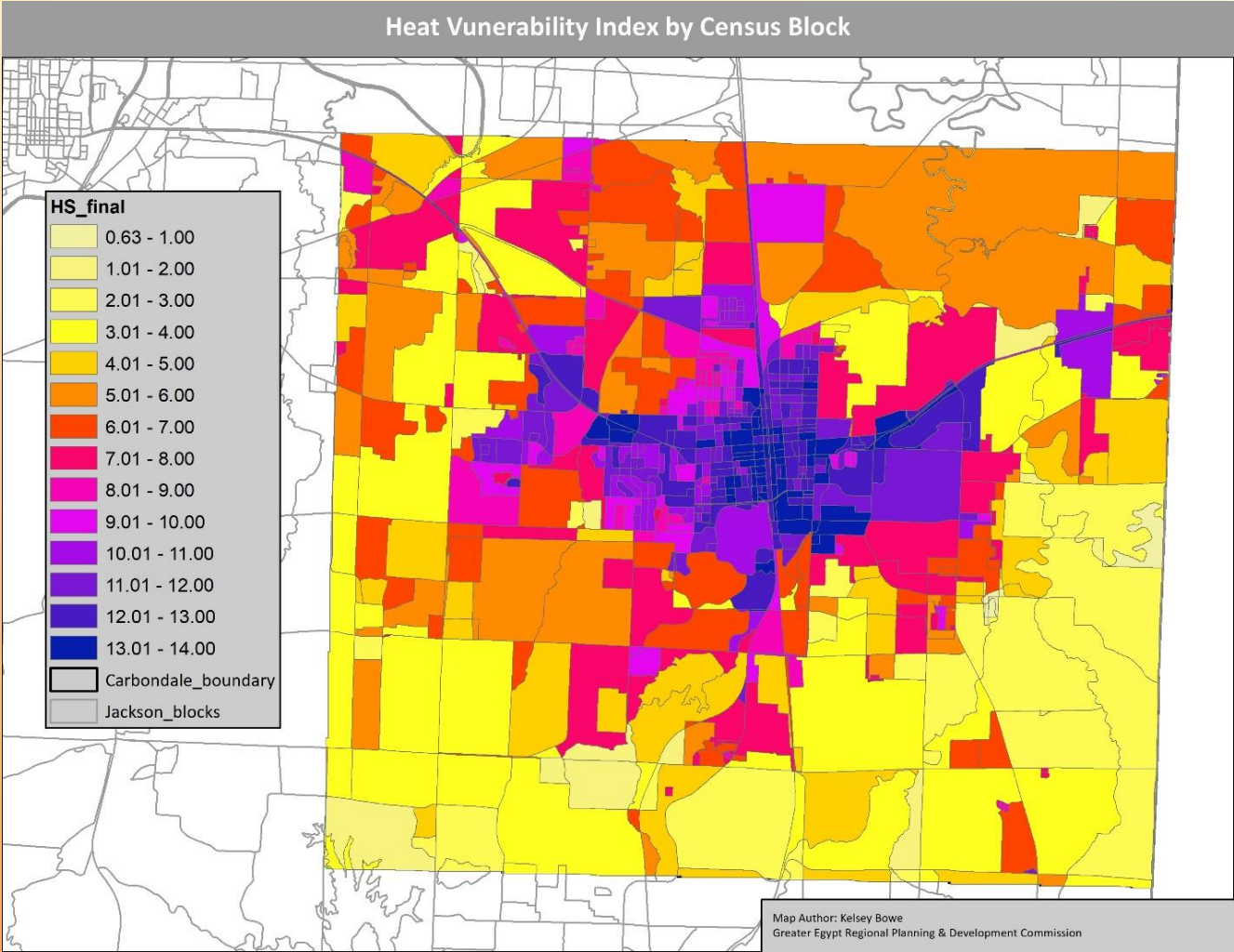


EXAMPLE OUTPUTS

Landcover Heat Score by Census Block



EXAMPLE OUTPUTS



# EXAMPLE OUTPUTS

# POTENTIAL PROJECTS FOR FUTURE GRANTS

## GIGO

- ▶ Bioinfiltration
  - ▶ **Swales**
  - ▶ **Street Trees**
  - ▶ Rain gardens
  - ▶ **Green Roofs**
  - ▶ Basins/ponds
- ▶ Permeable pavers
- ▶ Wetland Creation/Restoration
- ▶ Floodplain Reconnection
- ▶ Rainwater Capture

## Other possibilities

- ▶ Solar carports
- ▶ Covered bus stops
- ▶ Shaded pavilions for apartment complexes, parks
- ▶ Cool roofs, reflective paint
- ▶ Incentive programs for homeowners & businesses to implement practices
- ▶ Improved bicycle & bus routes, increased bike parking to decrease vehicle traffic & emissions

# 604(B) WATER QUALITY MANAGEMENT PLANNING GRANTS

- ▶ Yearly application period, currently closed
- ▶ determine the nature, extent, and causes of point and nonpoint source water pollution
- ▶ develop water quality management plans
- ▶ develop technical and administrative guidance tools for water pollution control
- ▶ develop preliminary designs for best management practices (BMPs) to address water quality problems
- ▶ implement administrative water pollution controls
- ▶ educate the public about the impact and importance of water pollution control

# QUESTIONS AND COMMENTS?

- ▶ Unmute yourselves or use the chat feature

