



Cuyahoga County  
Together We Thrive

# Cuyahoga County Climate Action Plan Kick-Off





# Agenda

- Welcome
- Background
- Overview of County's first Greenhouse Gas Emissions Inventory
- Overview of Climate Change in Cuyahoga County
- Climate Mitigation and Adaptation Planning Kick-Off
  - City of Cleveland CAP update – Matt Gray
  - Focus Area Break-Out: Energy, Water, Transportation, Land Use, Health
- Closing Remarks & Next Steps



# Background and Update



Cuyahoga County  
Together We Thrive



COMPACT  
of MAYORS

07/10/17

Dear Compact of Mayors Secretariat,

I hereby declare the intent of the County of Cuyahoga, in the state of Ohio, to comply with the Compact of Mayors, the world's largest cooperative effort among local government leaders to reduce greenhouse gas emissions, track progress, and prepare for the impacts of climate change.

The Compact of Mayors has defined a series of requirements that cities and counties are expected to meet over time, recognizing that each local government may be at a different stage of development on the pathway to compliance with the Compact.

I commit to advancing Cuyahoga County along the stages of the Compact, with the goal of becoming fully compliant with all the requirements within three years. Specifically, I pledge to publicly report on the following within the next three years:

- The greenhouse gas emissions inventory for our county consistent with the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC), within one year or less
- The climate hazards faced by our county, within one year or less
- Our target to reduce greenhouse gas emissions, within two years or less
- The climate vulnerabilities faced by our county, within two years or less
- Our plans to address climate change mitigation and adaptation within three years or less

Very truly yours,

Armond Budick  
County Executive  
Cuyahoga County

## Completed/In progress

- ✓ Greenhouse Gas Emissions Inventory
- ✓ Climate Change Impacts
- ✓ Climate Vulnerabilities

## Working towards ...

- ☐ Target for GHG emissions reductions
- ☐ Climate Change Mitigation and Adaptation Plan

# Cuyahoga County Community GHG Emissions Inventory: Overview



Source	2010	2017	GHG Change (million MTCO <sub>2</sub> e)	Emissions % change
<b>Stationary Energy</b>	<b>15.4</b>	<b>12.2</b>	<b>-3.26</b>	<b>-21%</b>
Natural Gas	6.5	6.0	-0.54	-8%
Residential	2.9	2.5	-0.35	-12%
Commercial	1.7	1.5	-0.24	-14%
Industrial	2.0	2.0	0.05	3%
Electricity	9.0	6.3	-2.72	-30%
Residential	2.5	1.7	-0.83	-33%
Commercial	3.3	2.2	-1.05	-32%
Industrial	3.2	2.3	-0.82	-26%
Fugitive NG Emissions	0.9	0.7	-0.22	-25%
<b>Transportation</b>	<b>5.3</b>	<b>5.7</b>	<b>0.45</b>	<b>9%</b>
On-Road	4.9	5.3	0.45	9%
Commercial Air	0.2	0.1	-0.03	-17%
Municipal Air	0.0	0.1	0.01	11%
Marine Vessels	0.2	0.2	0.02	13%
<b>Waste</b>	<b>0.7</b>	<b>0.5</b>	<b>-0.16</b>	<b>-24%</b>
Solid Waste	0.4	0.3	-0.16	-36%
Wastewater	0.2	0.2	0.00	-1%
<b>Industrial Process</b>	<b>3.8</b>	<b>4.4</b>	<b>0.60</b>	<b>16%</b>
<b>Total</b>	<b>26.1</b>	<b>23.5</b>	<b>-2.59</b>	<b>-10%</b>

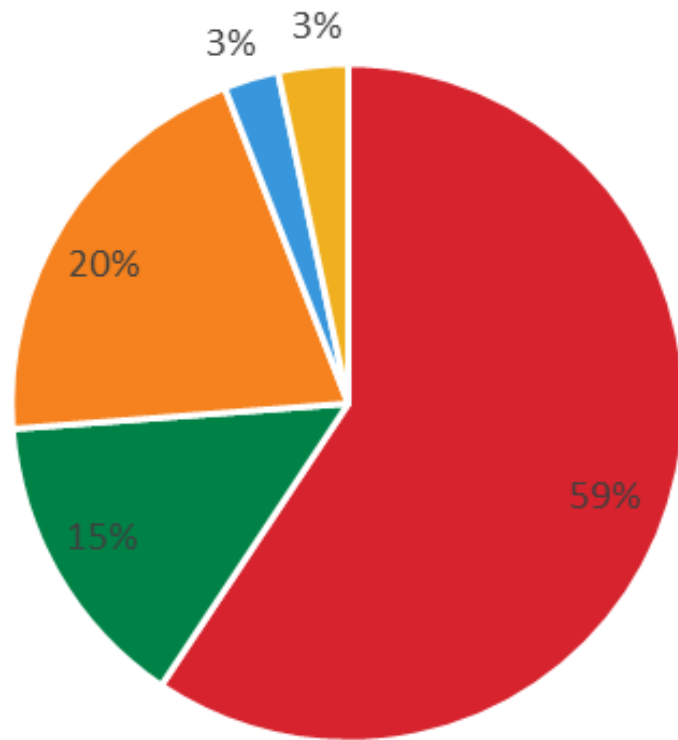
- Completed with the Brendle Group in conjunction w/the City of Cleveland's GHG inventory update
- 2010-17 data
- Energy (electricity and natural gas), Transportation, Waste, and Industrial Processes
- 10% total decrease in emissions
- Energy emissions decrease by 21%
- Transportation emissions increase by 9%
- All data is still being validated but not expected to change significantly

# Cuyahoga County Community GHG Emissions Inventory:

## Emissions make up by source

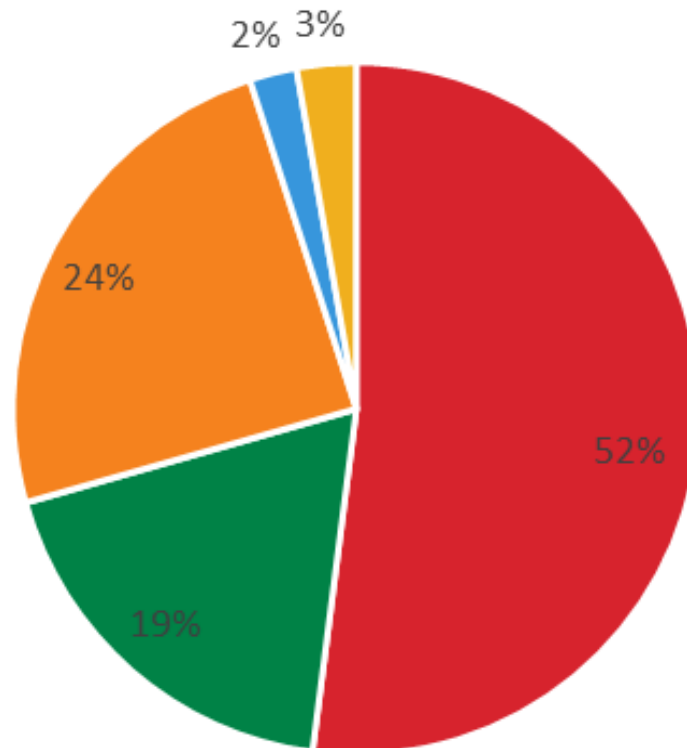


2010



Total Emissions: 26.1  
million mTCO<sub>2</sub>e

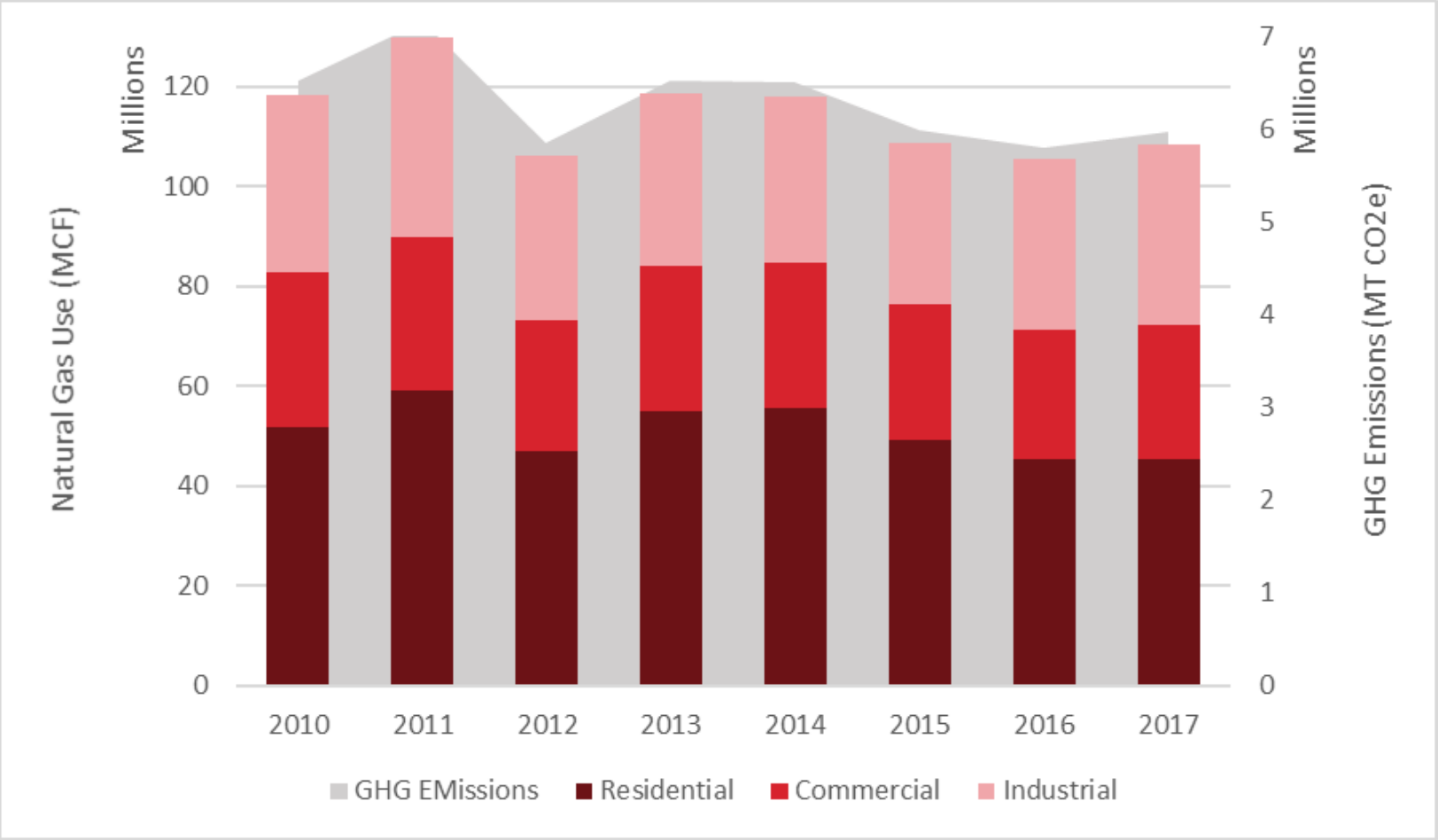
2017



Total Emissions: 23.5  
million mTCO<sub>2</sub>e

- Energy Use
- IPPU
- Transportation
- Waste
- Fugitive Natural Gas

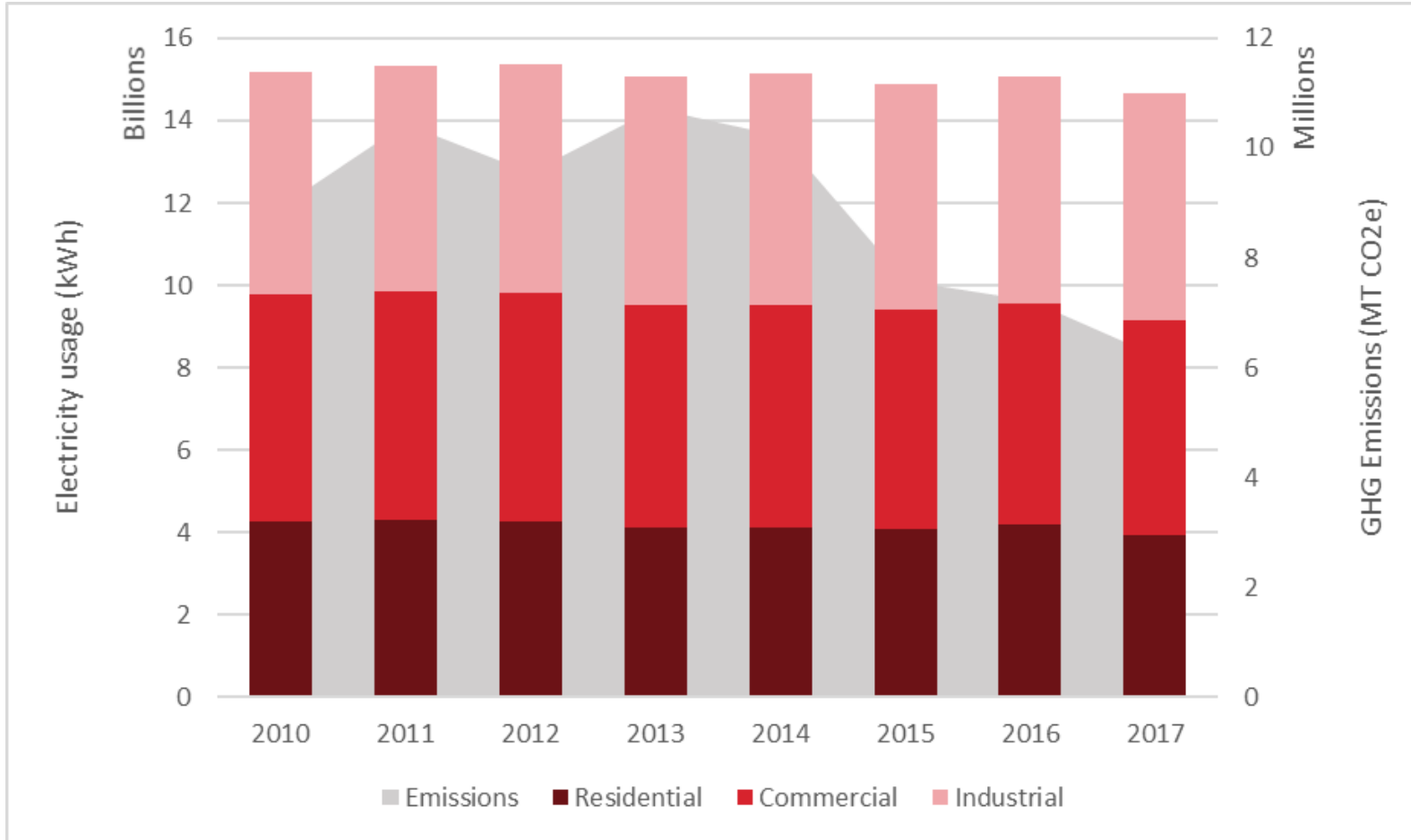
# Cuyahoga County Community GHG Emissions Inventory: Energy Trends – Natural Gas



- Natural gas consumption and emissions have decreased by 8% from 2010-17

*Trends in Natural Gas Consumption and Emissions*

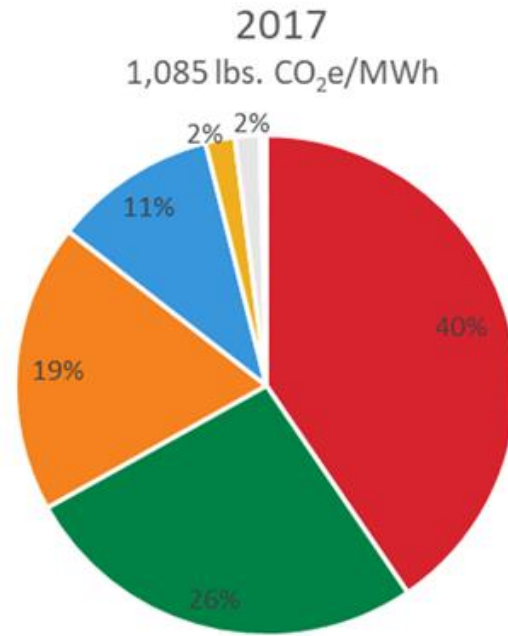
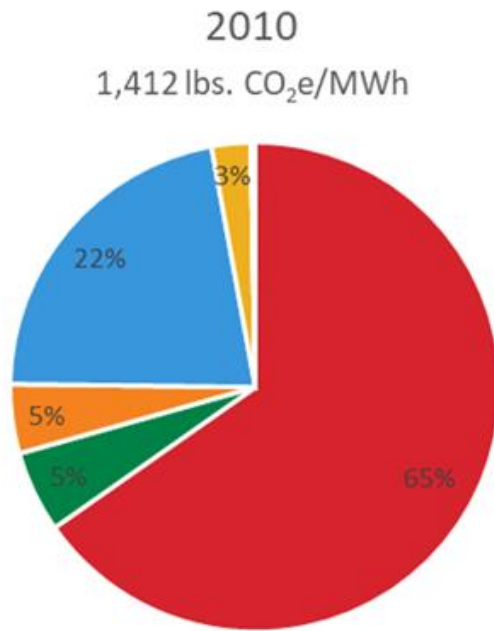
# Cuyahoga County Community GHG Emissions Inventory: Energy Trends - Electricity



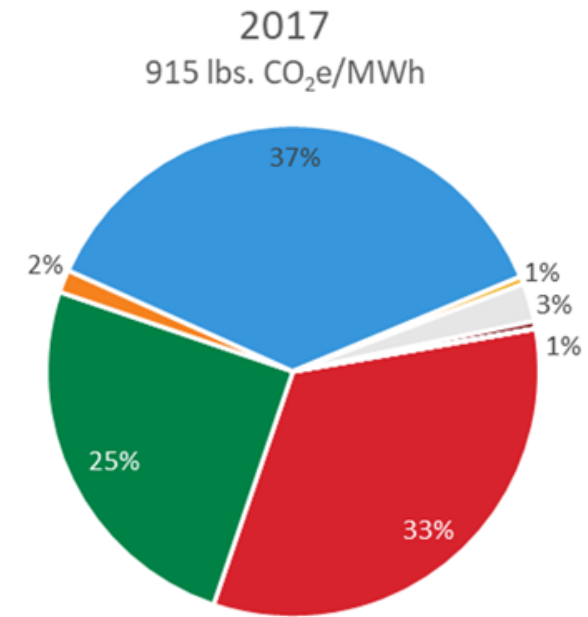
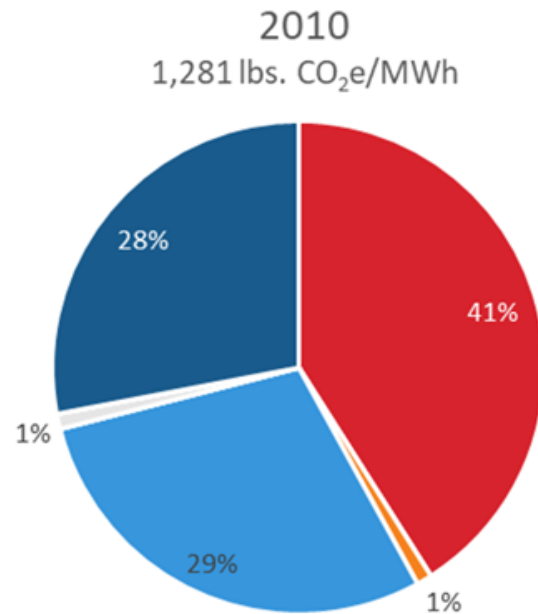
- 7% decrease in residential use
- 6% decrease in commercial use
- 3% increase in industrial use
- 30% reduction in emissions overall

*Trends in Electricity Use*

## Cleveland Public Power Generation Mix



- Coal
- Natural Gas
- Large Hydro
- Nuclear
- Renewable
- Wind
- Landfill Gas
- Oil
- Solar

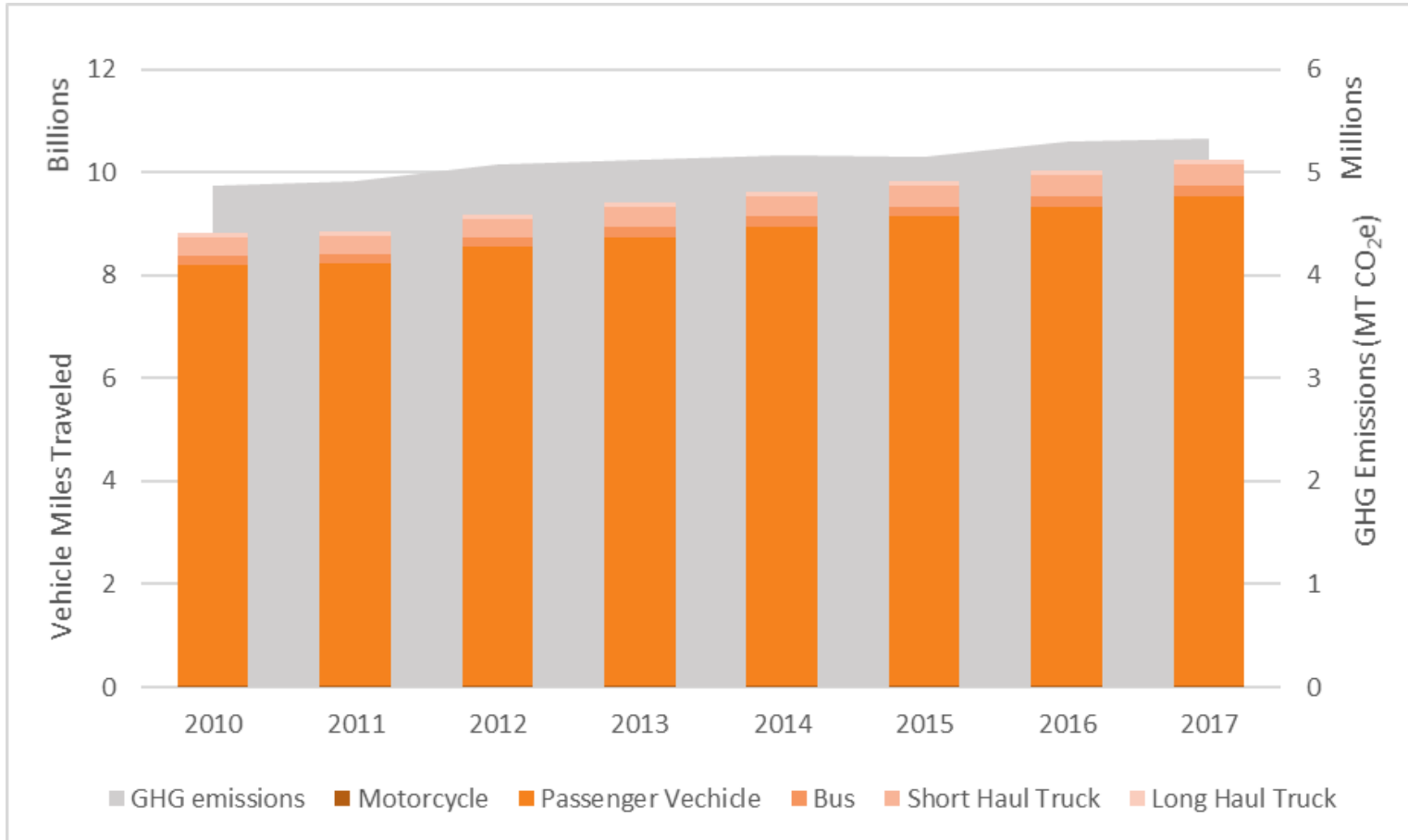


- Coal
- Natural Gas
- Large Hydro
- Nuclear
- Renewable
- Wind
- Landfill Gas
- Oil
- Solar

Power Generation Mix in First Energy Grid Territory



# Cuyahoga County Community GHG Emissions Inventory: Transportation



*Trends in VMT and GHG emissions*

- 9% increase in GHG emissions from transportation
- Passenger vehicles make up 93% of the total VMT and 78% of the on-road transportation emissions

# Cuyahoga County Community GHG Emissions Inventory: Transportation



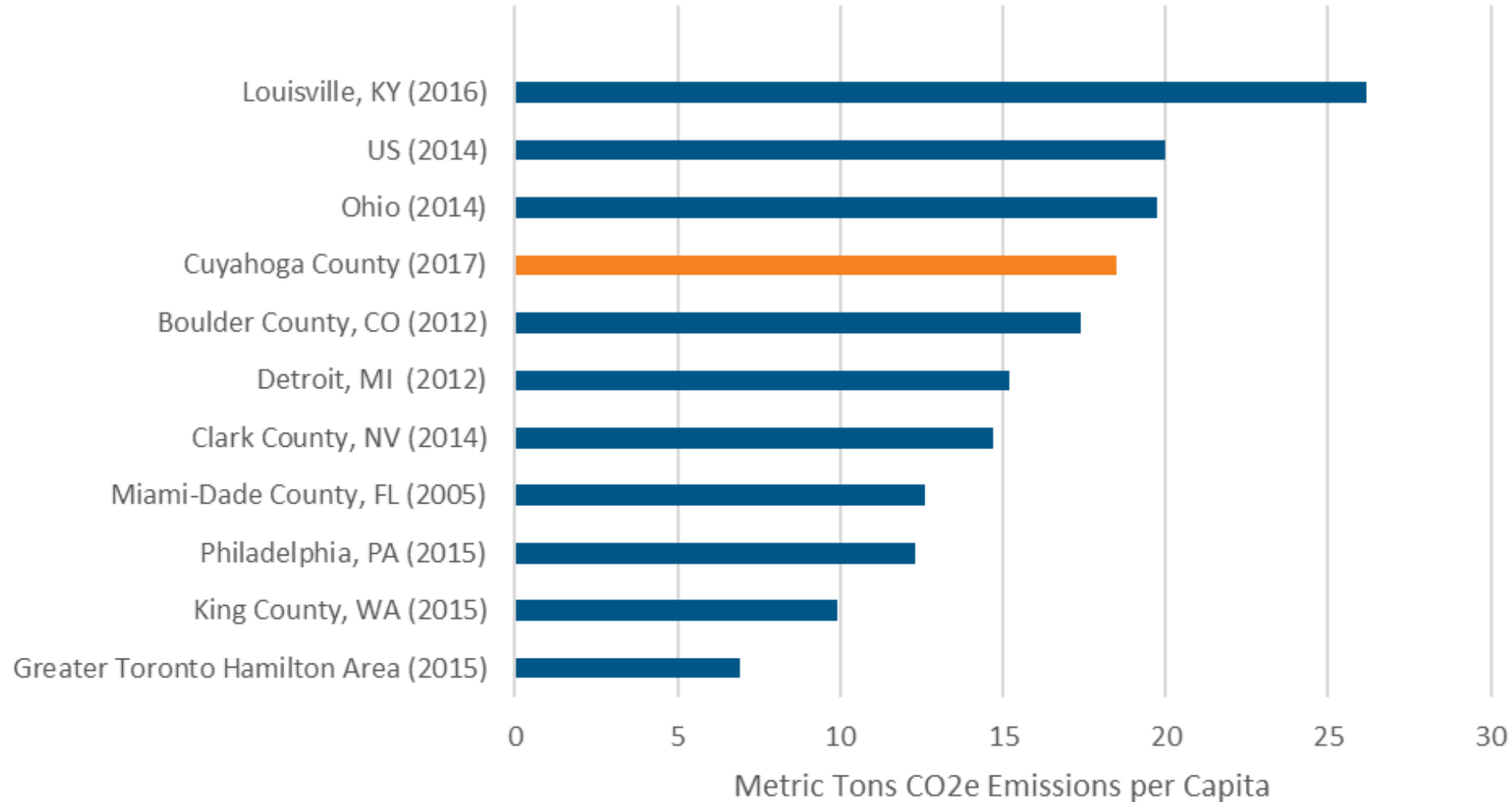
	2010	2016	Difference
<b>Workers</b>	559,301	579,624	20,323
<b>Single Occupancy Vehicle Drivers</b>	442,426	455,650	13,224
<b>SOV %</b>	79.10%	78.61%	-0.49%
<b>Carpoolers</b>	43,658	46,034	2,376
<b>Carpool %</b>	7.81%	7.94%	0.14%
<b>Transit Riders</b>	31,187	27,705	(3,482)
<b>Transit %</b>	5.58%	4.78%	-0.80%
<b>% Commute &gt; 30 minutes</b>	31.1	31.8	0.70
<b>Mean Commute</b>	22.70	23.20	0.50
<b>Zero Car Households</b>	5%	4.5%	-0.5%

ACS Commuting Characteristics Data for Cuyahoga County

# Cuyahoga County Community GHG Emissions Inventory: Per Capita



Cuyahoga County Per-Capita Emissions vs. Other Jurisdictions



# Cuyahoga County Community GHG Emissions Inventory: 2016 Baseline

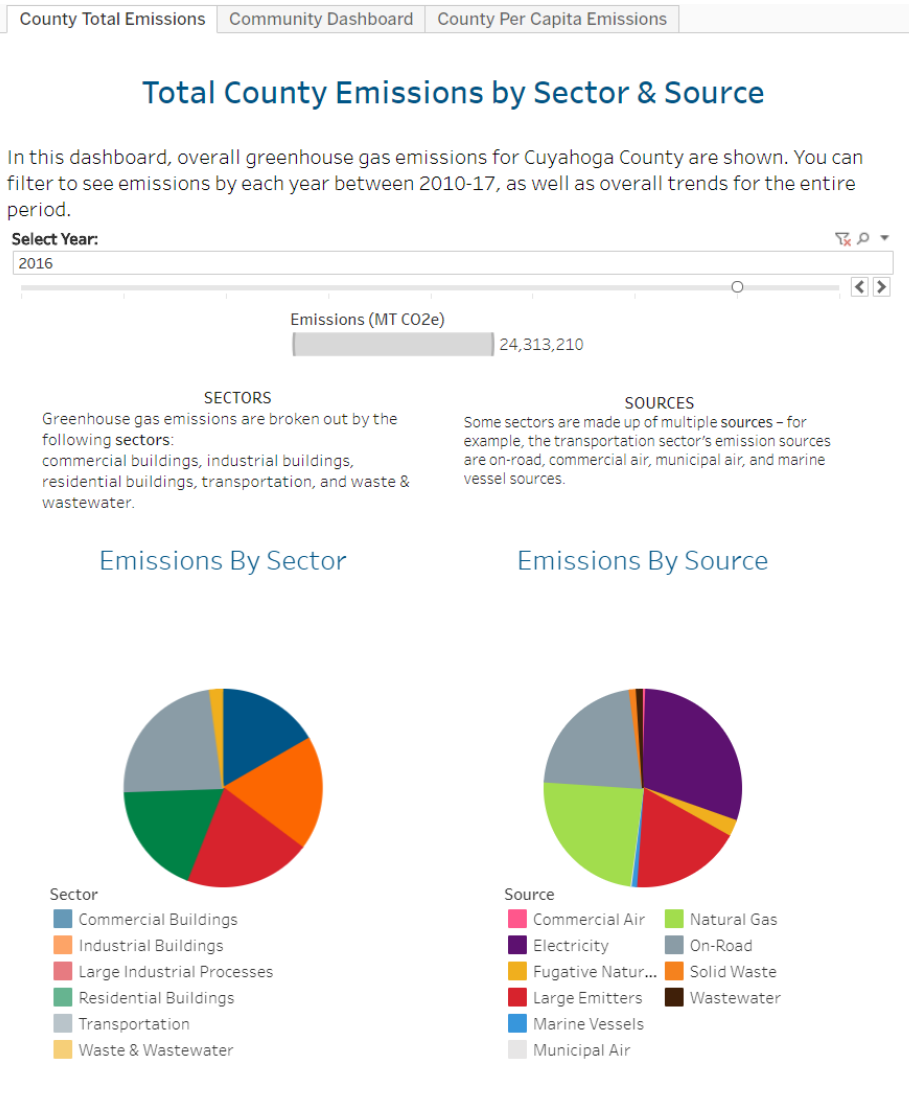


YEAR	2016
Cuyahoga County	24,313,210
Stationary Energy	13,076,525
Natural Gas	5,812,786
Residential	2,496,462
Commercial	1,439,982
Industrial	1,876,343
Electricity	7,263,739
Residential	1,997,321
Commercial	2,613,630
Industrial	2,652,788
Fugitive Natural Gas	658,109
Transportation	5,687,740
On-Road	5,298,651
Commercial Air	130,066
Municipal Air	45,930
Marine Vessels	213,094
Waste	521,729
Solid Waste	281,058
Wastewater	240,671
IPPU	4,369,107
Large Emitters	4,369,107
Emissions per Capita	19.45881892

- 2016 will be our baseline year for reduction targets
- All data was available

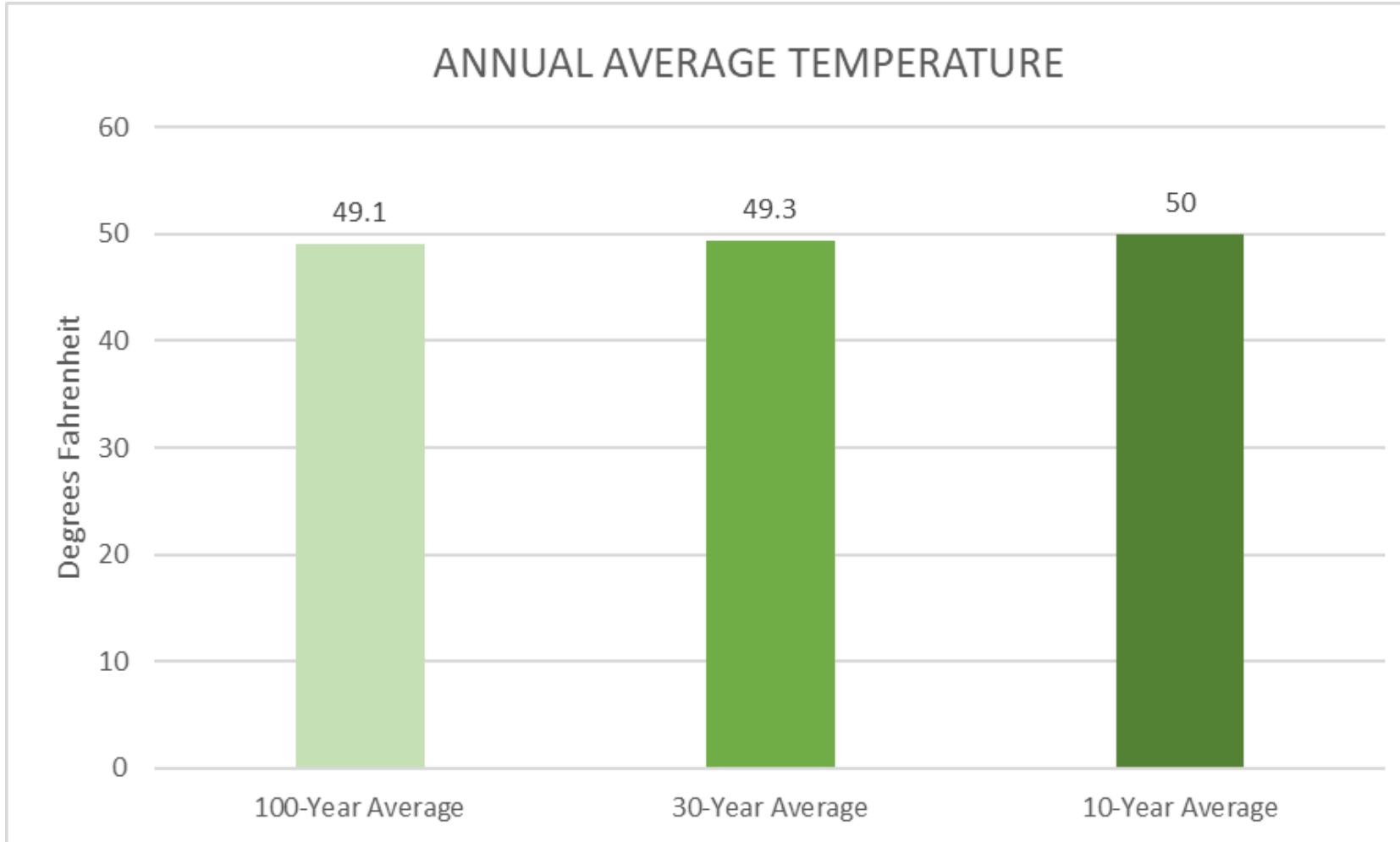


# Cuyahoga County Community GHG Emissions Inventory: Community Breakouts



[Dashboard](#)

# Cuyahoga County Climate Change Overview: Annual Average Temperature

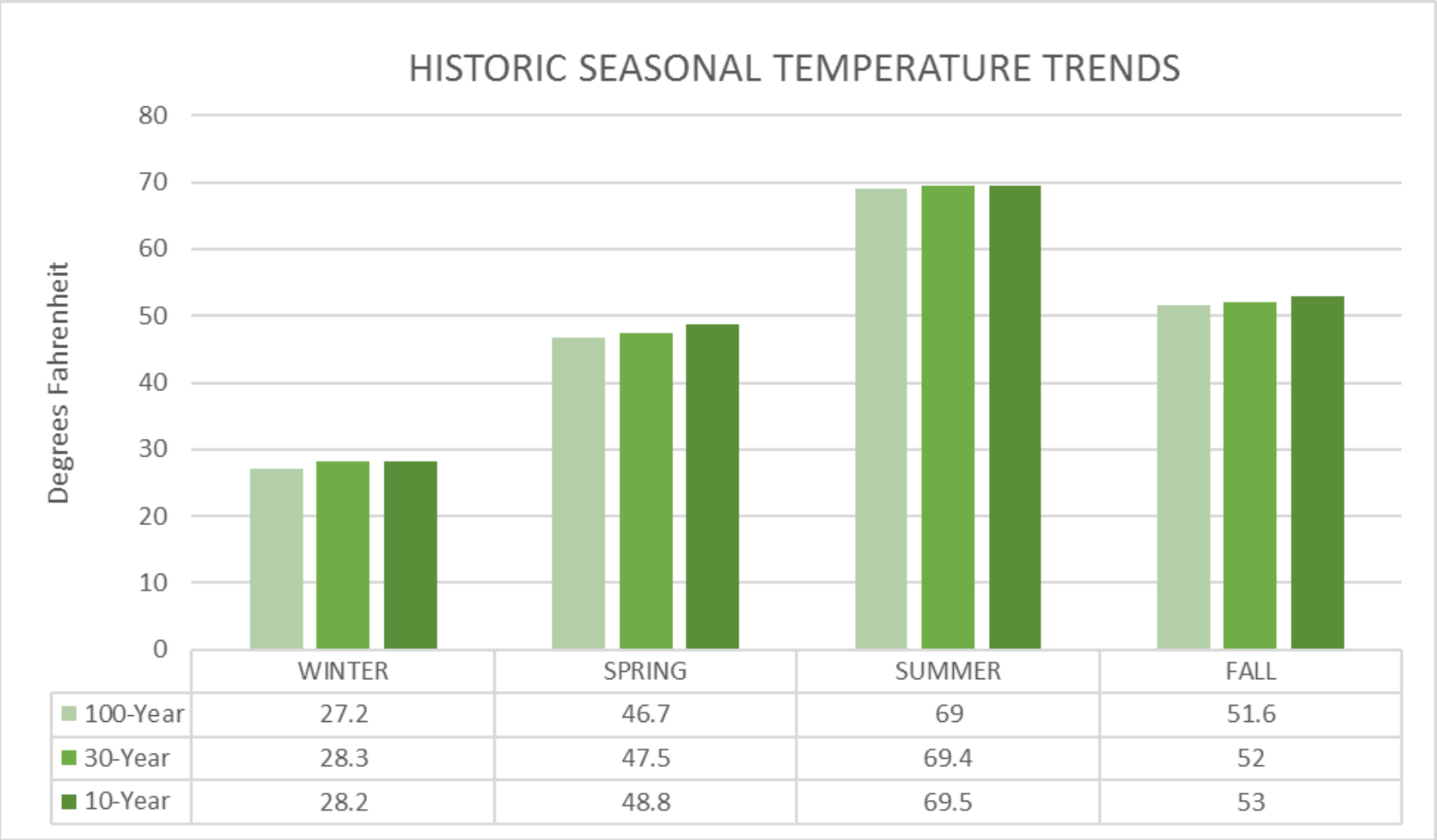


Graph illustrates three climate periods including: Historic 100-Year Average, 30-Year Average (normal), and the Most Recent 10-Year Average.

- Recent 10-year vs.
  - 100-year increased by 1.8%
  - 30-year increased by 1.4%

*Source: Midwestern Regional Climate Center*

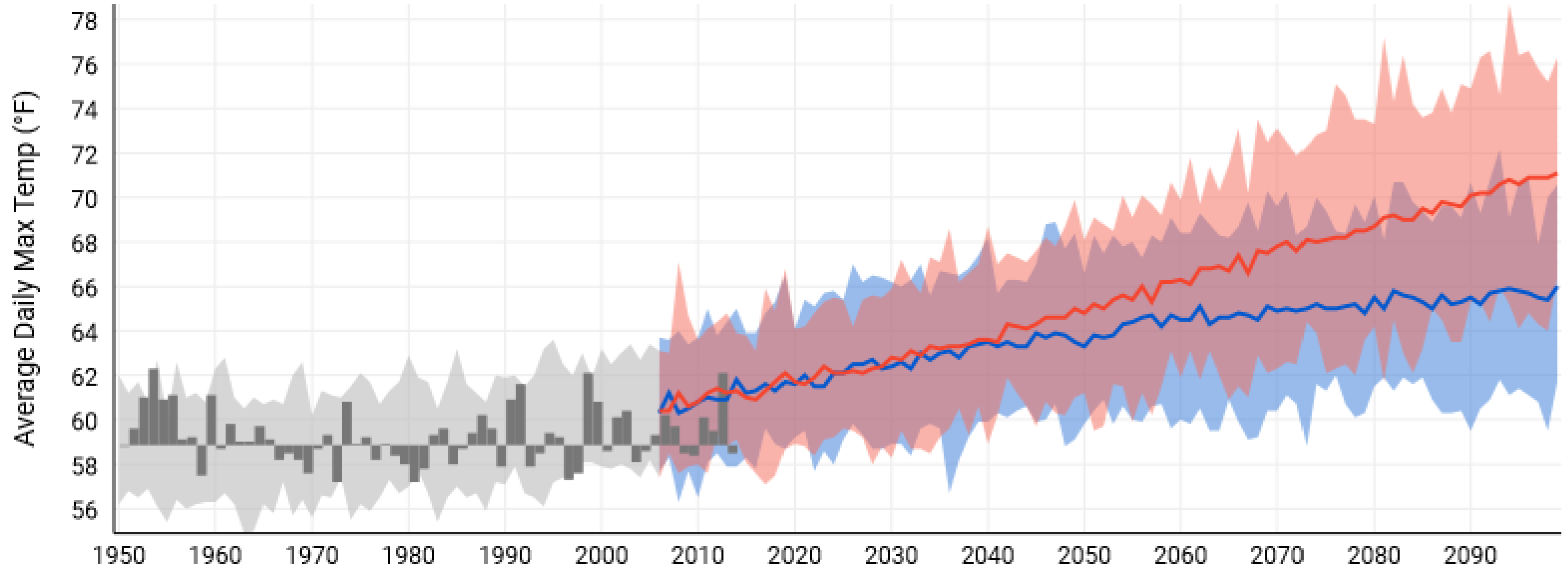
# Cuyahoga County Climate Change Overview: Historic Seasonal Temperature



- Temperatures rose in all seasons
- Spring and Fall show the largest increases
- Recent 10-year vs. 100-year:
  - Spring increased by 4.5%
  - Winter increased by 3.6%

Source: Midwestern Regional Climate Center

# Cuyahoga County Climate Change Overview: Temperature - Projections



Source: US Climate  
Resilience Toolkit



Observations



Historical (Modeled)



Lower Emissions



Higher Emissions



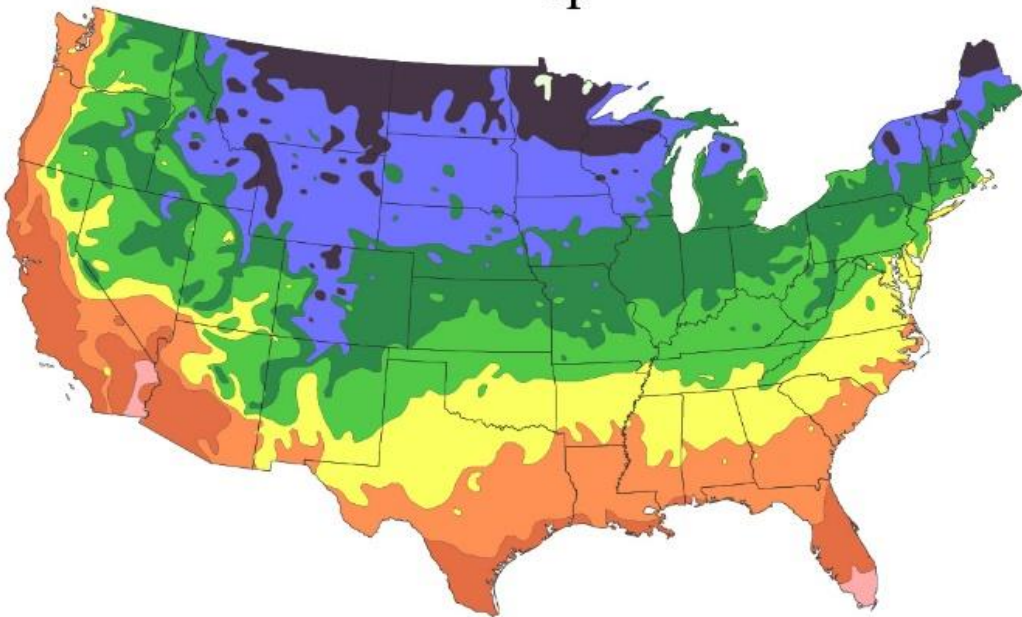
Averages



# Cuyahoga County Climate Change Overview: Growing Season

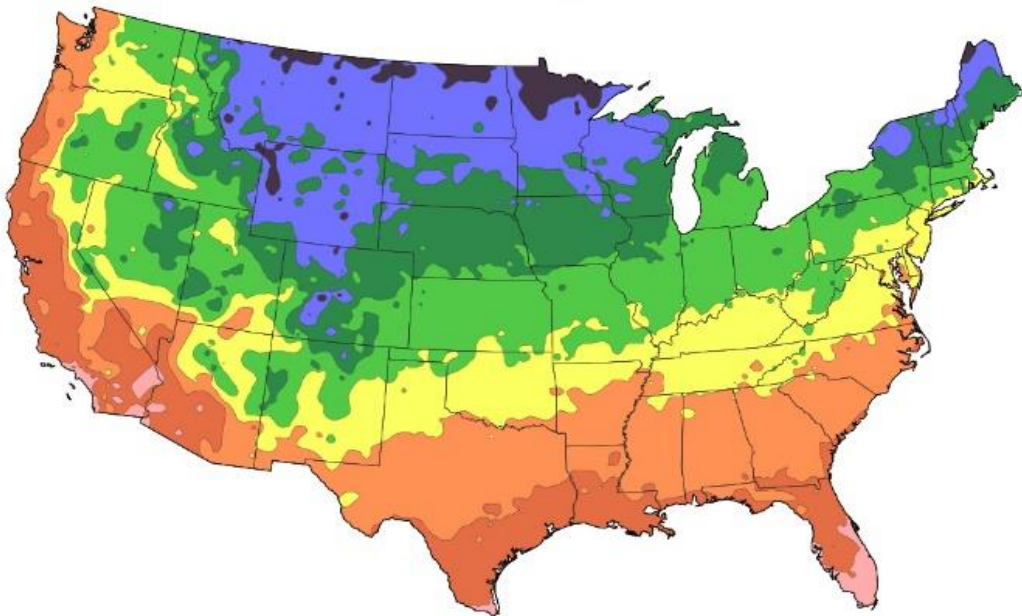


1990 Map

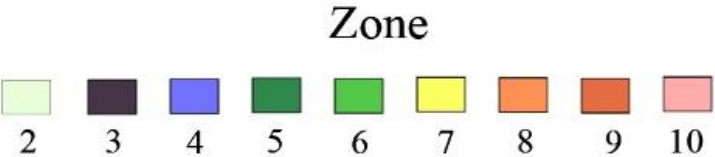


After USDA Plant Hardiness Zone Map, USDA  
Miscellaneous Publication No. 1475, Issued  
January 1990.

2015 Map

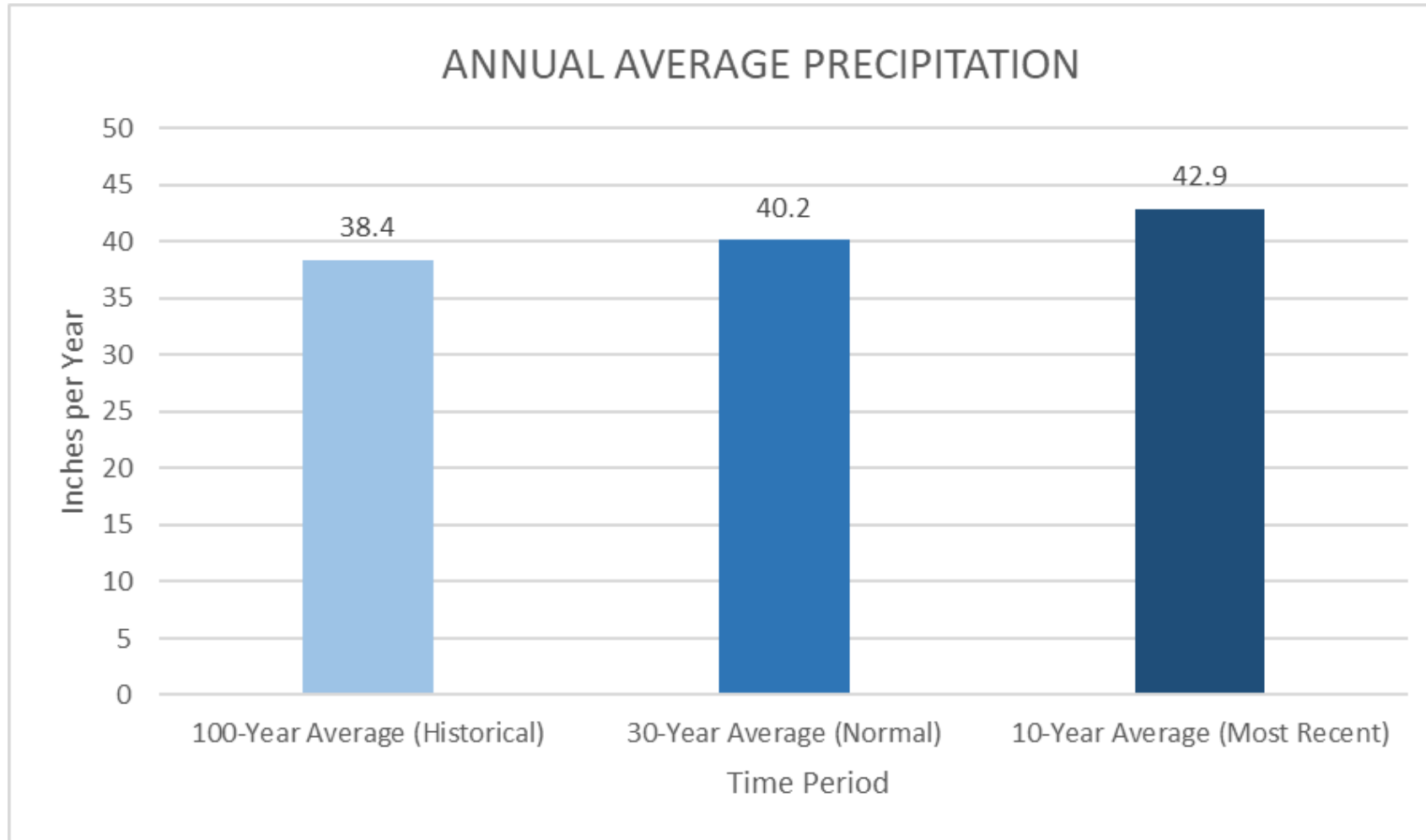


Arbor Day Foundation Plant Hardiness Zone  
Map published in 2015.



© 2015 Arbor Day Foundation®

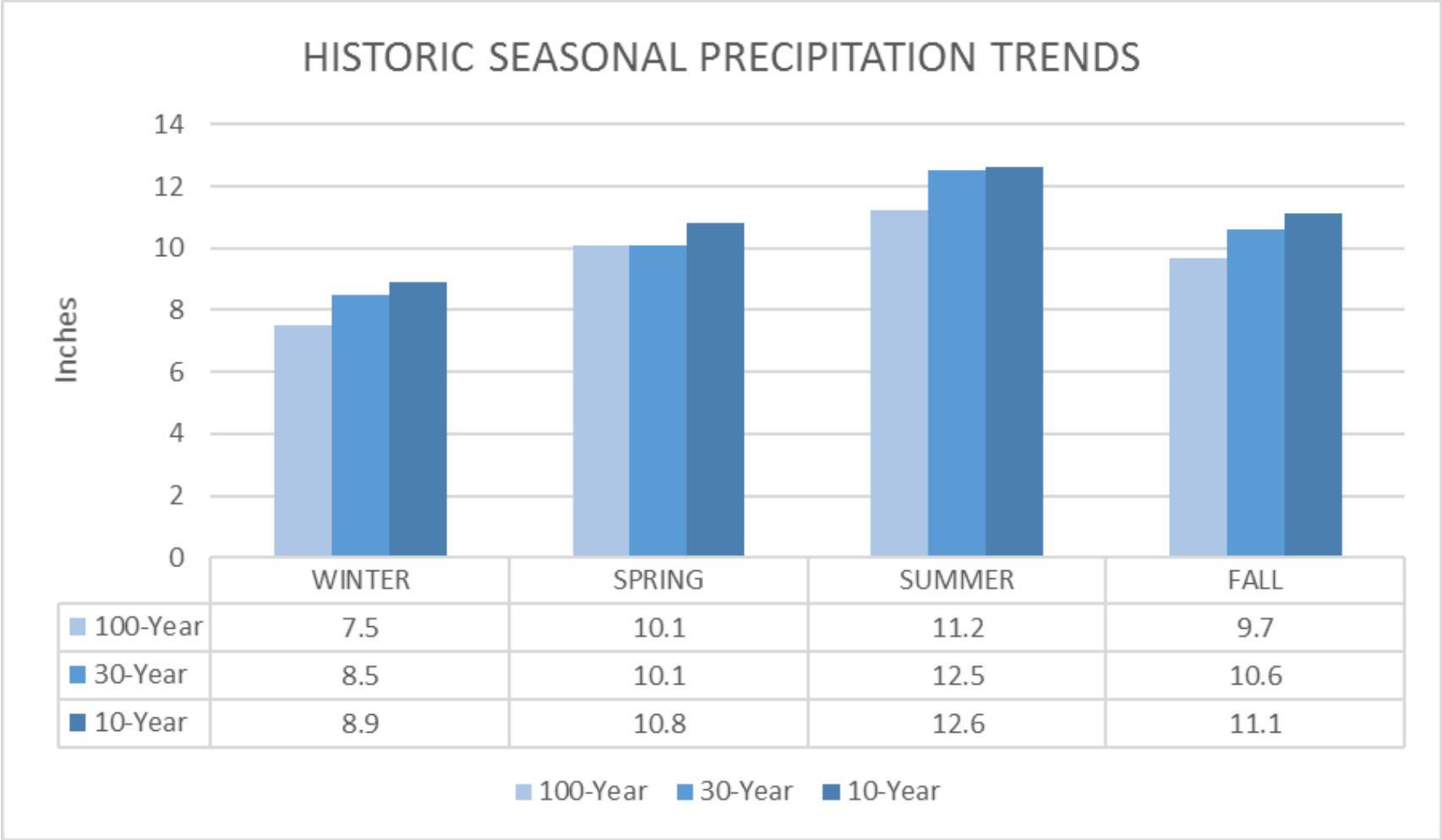
# Cuyahoga County Climate Change Overview: Precipitation



- Recent 10-year vs.
  - 100-year increased by 12.8%
  - 30-year increased by 7.7%

*Source: Midwestern Regional Climate Center*

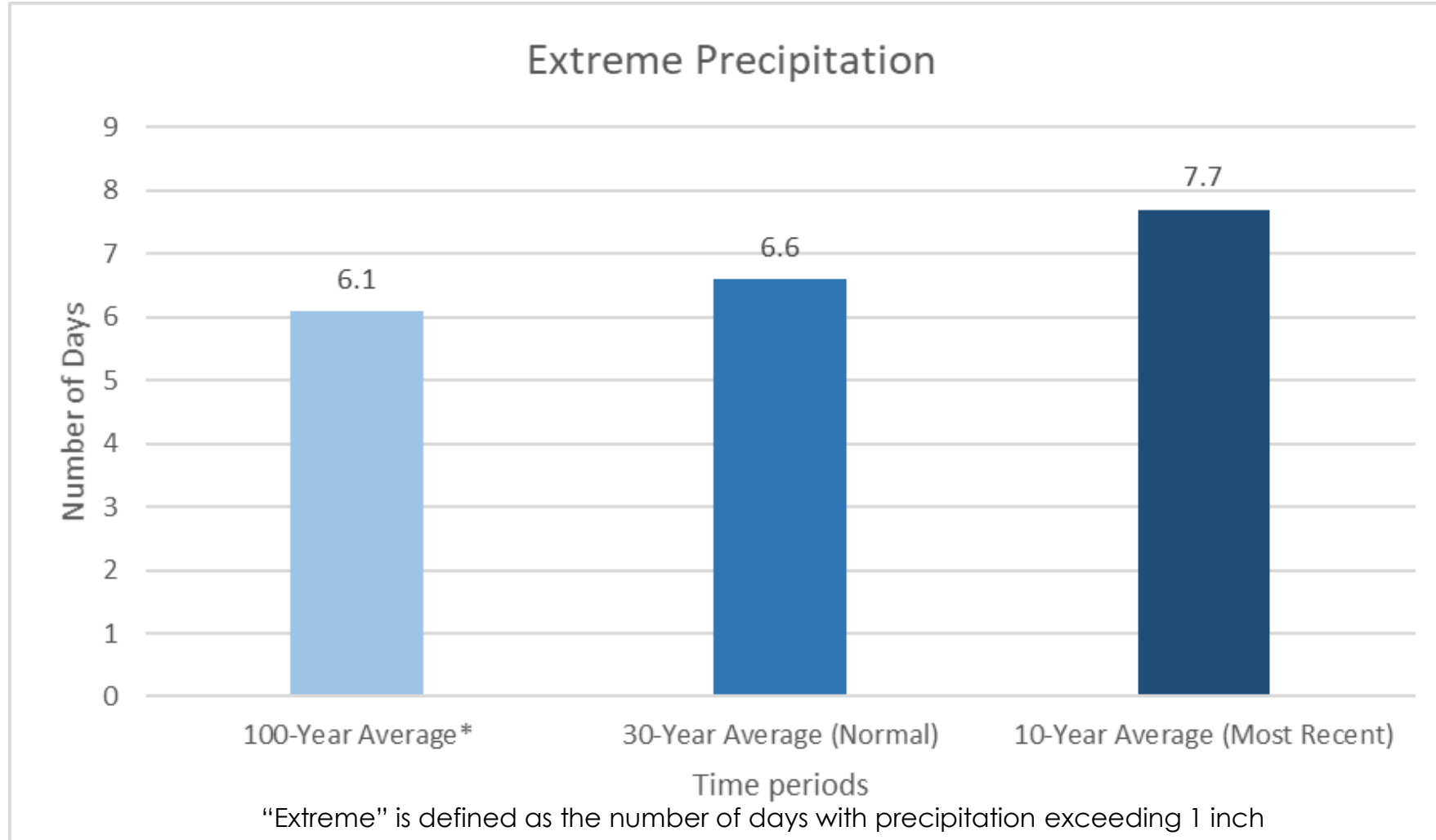
# Cuyahoga County Climate Change Overview: Precipitation



- Precipitation rose in all seasons
- Winter shows the largest increases
- Recent 10-year vs. 100-year:
  - Winter increased by 18.7%
  - Fall increased by 14.4%

Source: Midwestern Regional Climate Center

# Cuyahoga County Climate Change Overview: Historic Extreme Precipitation

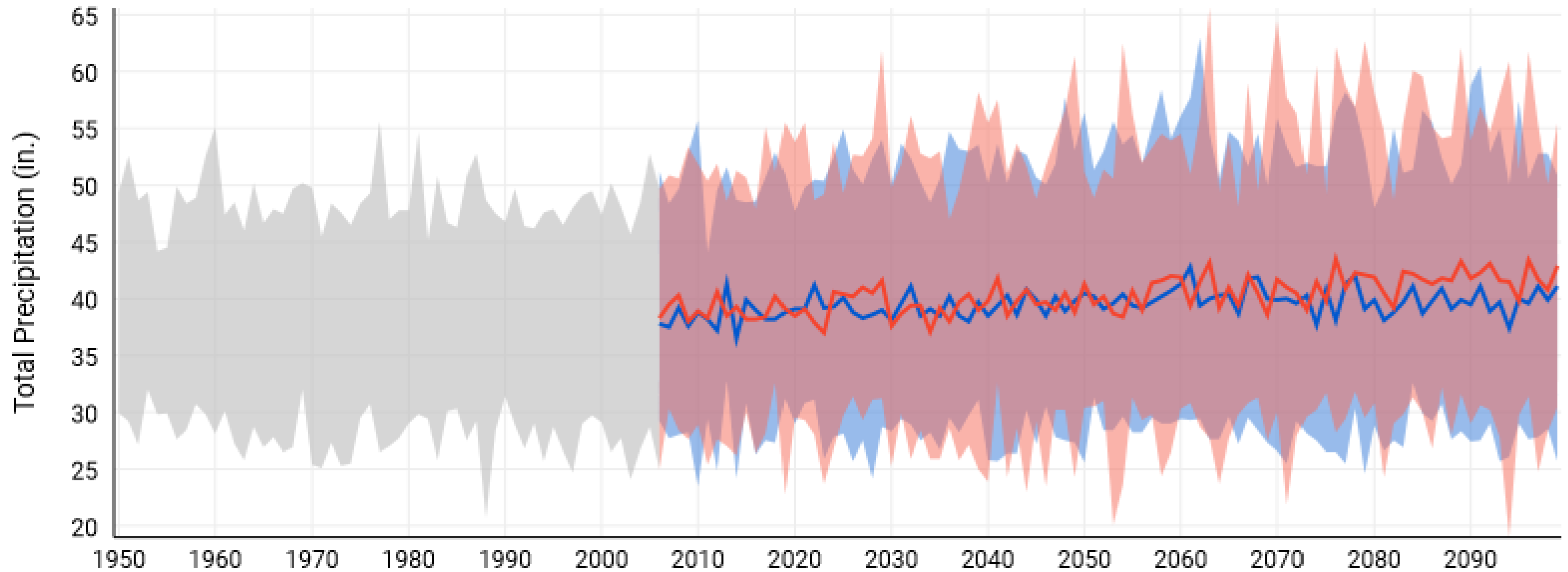


- Recent 10-year vs.
  - 100-year increased by 26.2%
  - 30-year increased by 16.6%

Source: Midwestern Regional Climate Center



# Cuyahoga County Climate Change Overview: Precipitation - Projections



Source: US Climate  
Resilience Toolkit



Observations



Historical (Modeled)



Lower Emissions



Higher Emissions



Averages



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# Cuyahoga County Climate Change Overview:

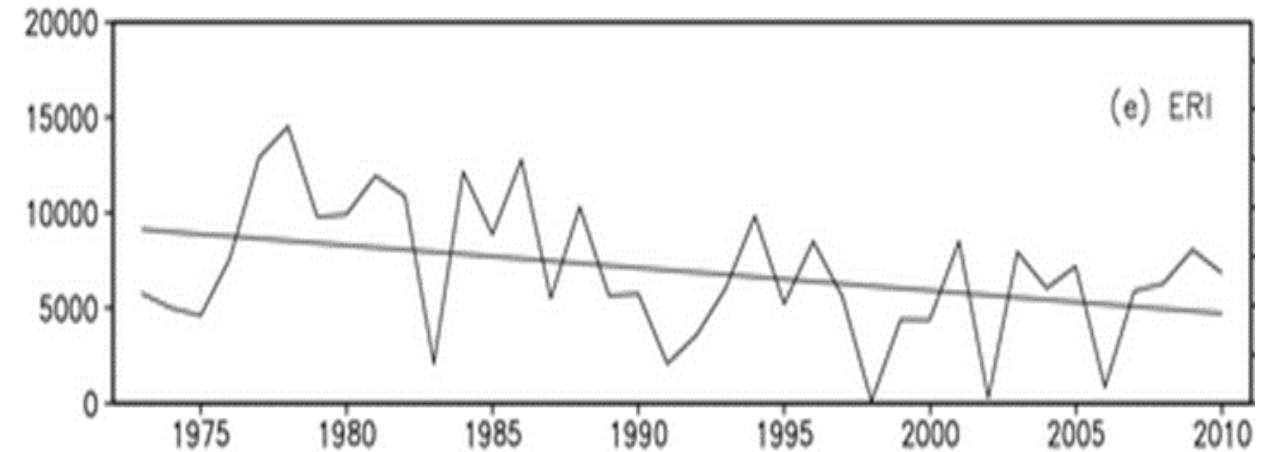
## Ice Cover



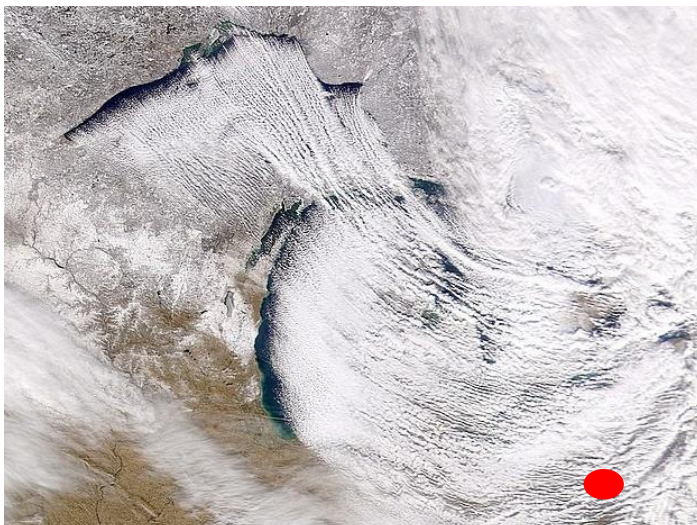
Great Lakes Ice Coverage Decline 1973-2010	
All Great Lakes	71%
Lake Ontario	88%
Lake Superior	79%
Lake Michigan	77%
Lake Huron	62%
Lake Erie	50%
Lake St. Clair	37%

Lake Ice Area (km<sup>2</sup>)

Annual Average Ice Coverage on Lake Erie

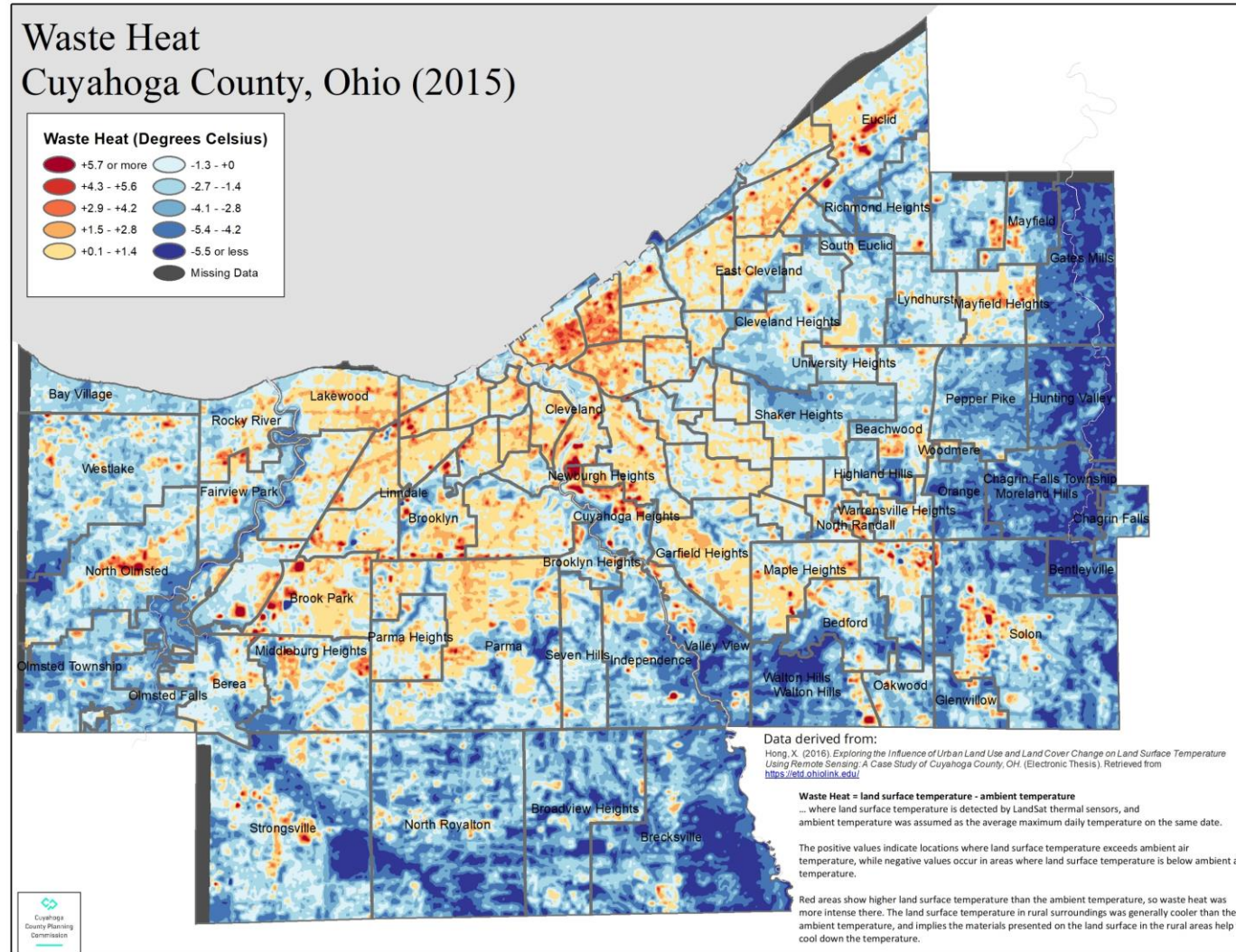


- Ice Cover on Lake Erie has decreased, the graph depicts the change in ice cover since 1975 in km<sup>2</sup>.



Source: GLISA (Great Lakes Integrated Sciences & Assessments)

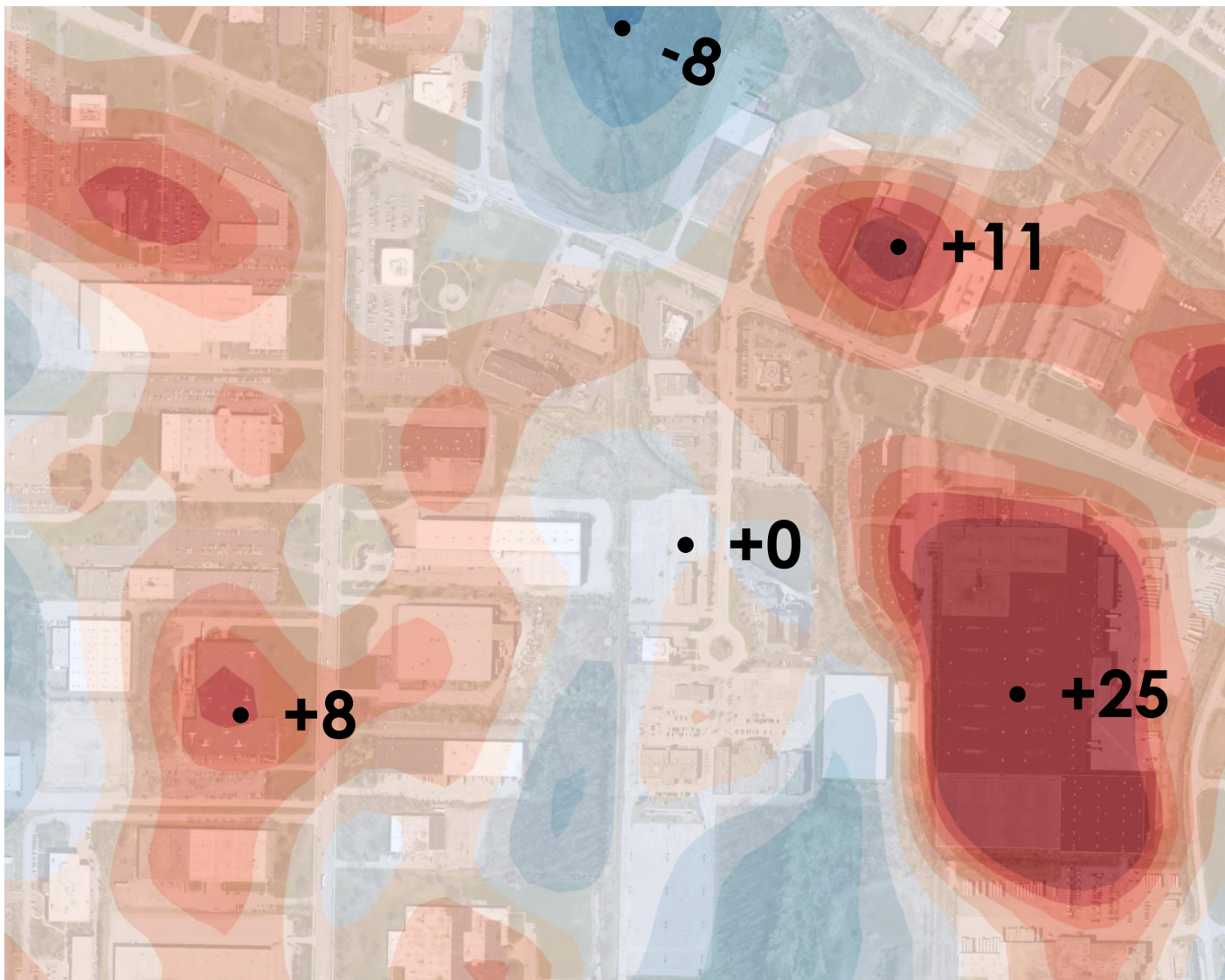
# Cuyahoga County Climate Change Overview: Urban Heat Island Effect



Hong, X. (2016). *Exploring the Influence of Urban Land Use and Land Cover Change on Land Surface Temperature Using Remote Sensing: A Case Study of Cuyahoga County, OH.* (Electronic Thesis). Retrieved from <https://etd.ohiolink.edu/>



# Cuyahoga County Climate Change Overview: Urban Heat Island Effect

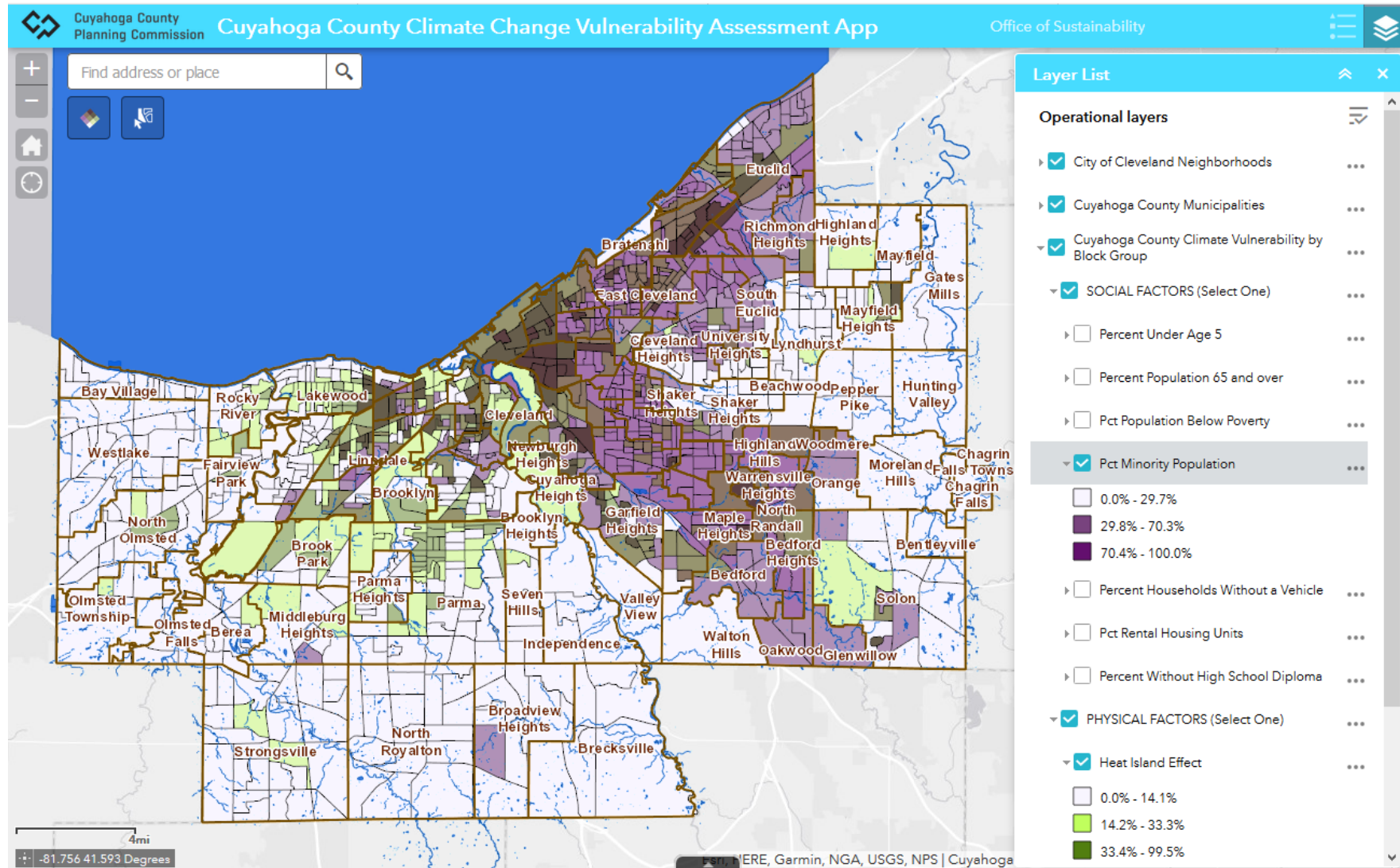


## Temperature Difference from Ambient Air

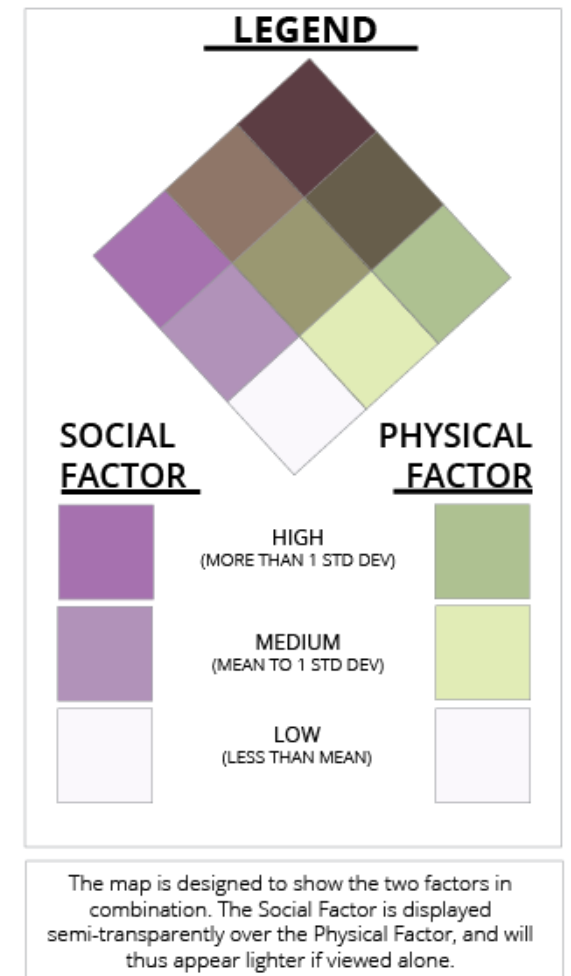
- Tree cover
- Building Treatments
- Infrastructure
- Parking



# Cuyahoga County Climate Change Overview: Vulnerability Assessment Tool



## Climate Vulnerability Map



# Cuyahoga County Climate Change Overview: Health



## Health Impacts Overview

- **Extreme Weather**
- **Foodborne Illness**
- **Vector-borne Illness & Epidemiology**
- **Waterborne Illness, Water Quantity & Quality**
- **Air Pollution & Allergens**
- **Plastics & Industrial Chemicals.**
- **Mental Health and Wellness**

# Cuyahoga County Climate Change Overview: Health



## Vector-borne diseases Ohio Arbovirus - 2017

**Change in habitat:** Increase viruses. Amplifying vectors.

### **Local: West Nile Virus: 27 human cases in Ohio**

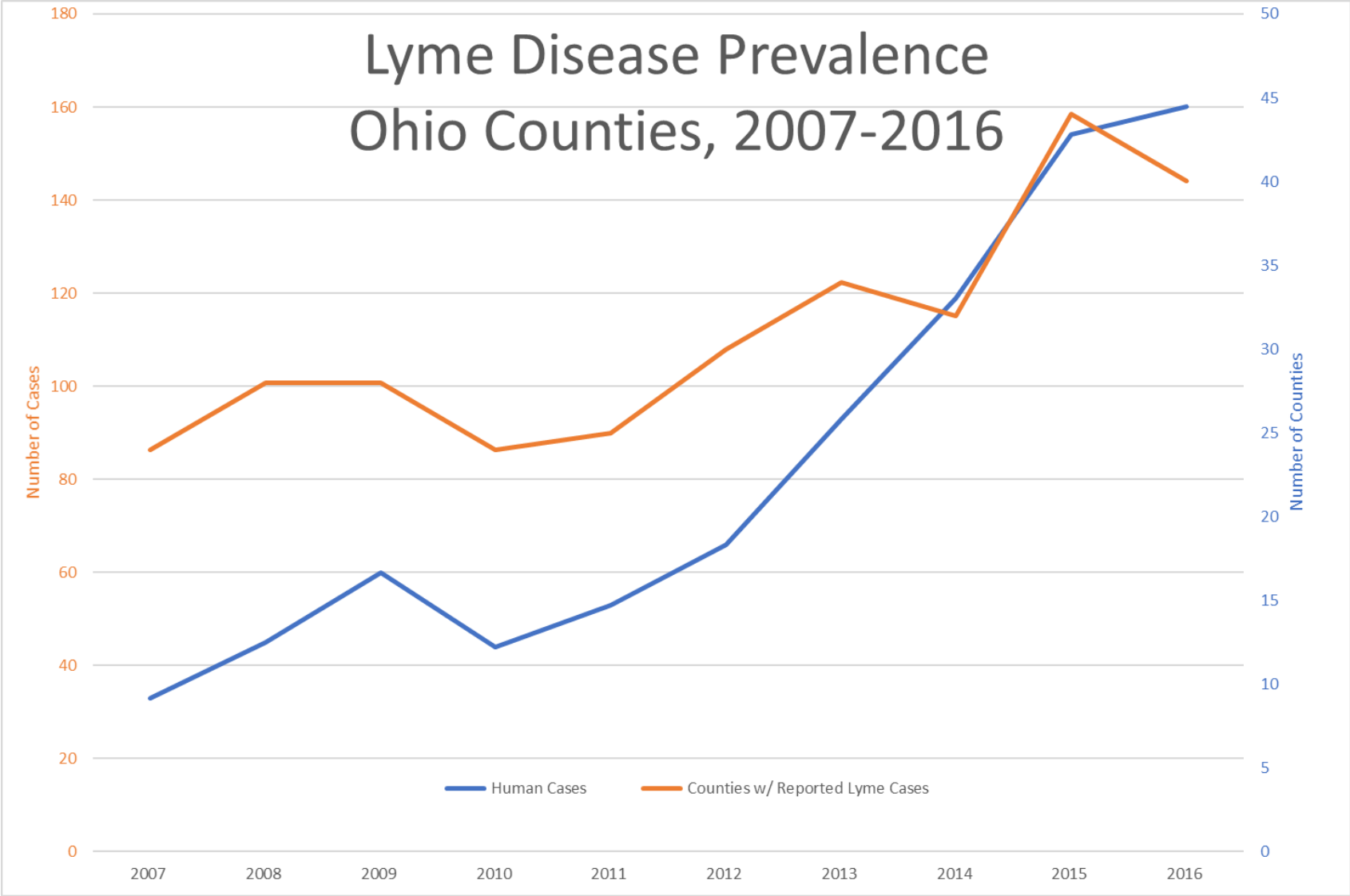
- 432,120 mosquitoes tested. 2,234 positive = 0.5% infected re: RVF in Africa
- La Crosse encephalitis – 4 infected
- Jamestown Canyon – 2 infected
- Unspecified California - 11 people

### **Travel-related tropical diseases in Ohio**

- Chikungunya – 3 cases
- Dengue – 3 infected
- Malaria - 52 contracted
- Ziika – 4 infected Malaria



# Cuyahoga County Climate Change Overview: Health



Source: Cuyahoga  
County Board of  
Health



# Cuyahoga County Climate Change Overview: Health



## Plastics & Industrial chemicals

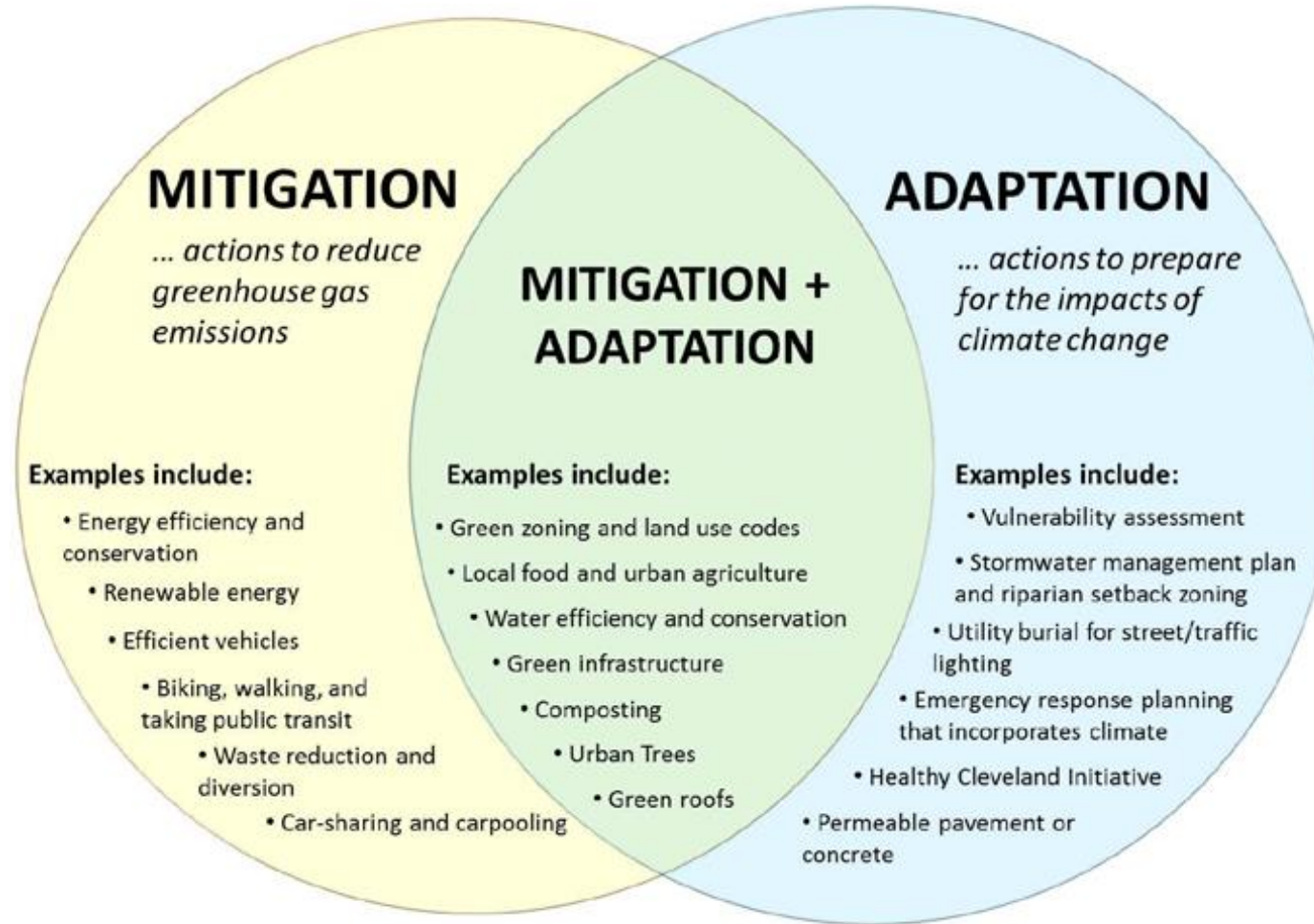
- Phthalates – plasticizers:
- endocrine disruptors
- mutagenic
- carcinogenic



# Climate Action Planning Kick-Off



- ❑ Target for GHG emissions reductions (from 2016 baseline)
- ❑ Climate Change Mitigation and Adaptation Plan





# City of Cleveland GHG emissions Inventory and CAP update



# Climate Action Planning: Focus Areas



Energy

Water

Transportation

Land Use

Health

- Focus Area meetings between now – September 2018
- Kick-off meetings now with 20 minutes in focus area break-outs

# Climate Action Planning: Focus Areas Group Work



1. Please list 3-4 actions related to your focus area (initial thoughts/ideas to be worked through more in additional focus area meetings)
2. Please let us know what you think our target for emission reductions should be
  - The City of Cleveland emission reductions goals are 16% by 2020, 40% by 2030, and 80% by 2050 from a 2010 baseline (county will use a 2016 baseline – all necessary data will be brought to additional focus area meetings)
3.
  - a. Who else should be at the table? Other organizations and institutions not present?
  - b. Is there any additional data or information you think we are missing?
  - c. Are there any other focus areas/topics beyond energy, health, transportation, water, and land use that should be considered?
4. Please let us know who will be leading your group and working with the County Department of Sustainability to coordinate your next focus area meeting
  - Do you have a date set?

# Closing Remarks & Next Steps

- Please email us with any general feedback
- Website will be launching and will include all information presented and updates as the planning process continues
- We will organize and send out reminders about focus area and full group meetings over the summer

