

CFAES

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WE SUSTAIN LIFE

Climate change in Ohio: What should you do?

Dr. Robyn S. Wilson, Professor of Risk Analysis and Decision Science
Sustainable UA Green Series



THE OHIO STATE UNIVERSITY

COLLEGE OF FOOD, AGRICULTURAL,
AND ENVIRONMENTAL SCIENCES



Wildfire in California 2018 - Photo: Josh Edelson/AFP/Getty Images



Flooding, Arkansas 2019 - Photo: Drone Base via AP



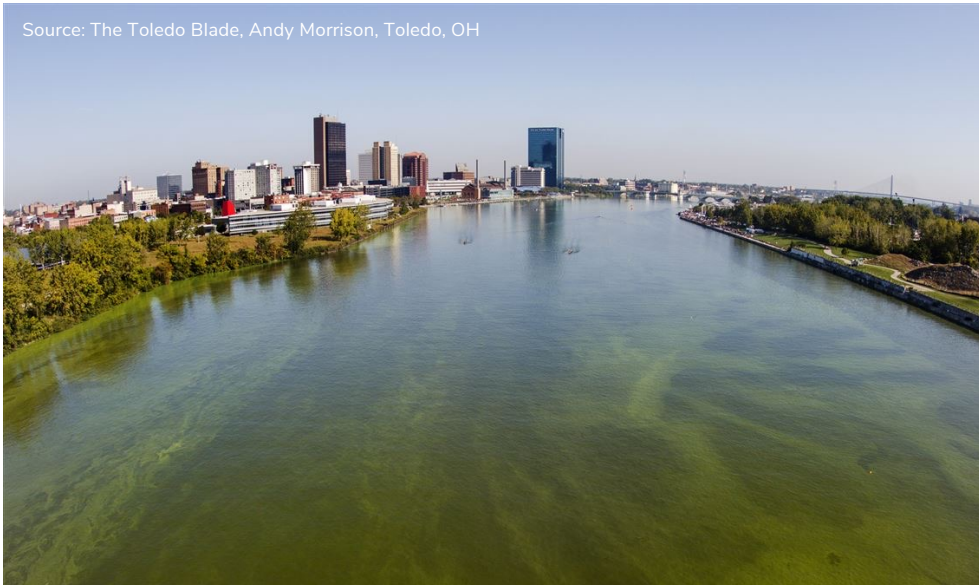
Drought, Lake Tahoe 2015 - Photo: Kathryn Reed



Heat wave, Washington, DC 2018 - Photo: Alex Wong, Getty Images



Source: The Toledo Blade, Andy Morrison, Toledo, OH



Source: AP Madalyn Ruggiero, Findlay, OH



TICKS

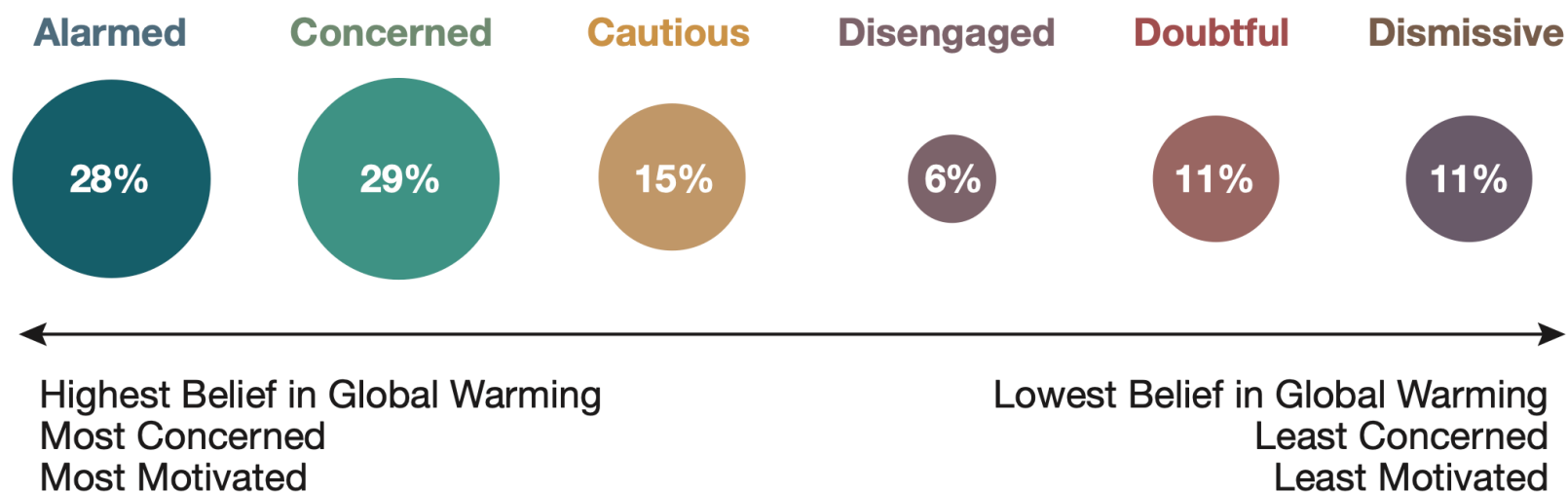
Blacklegged Tick
(deer tick)
(can spread Lyme disease)



American dog tick
(wood tick)
(does not spread Lyme disease)



Source: AEP Ohio Twitter, central Ohio



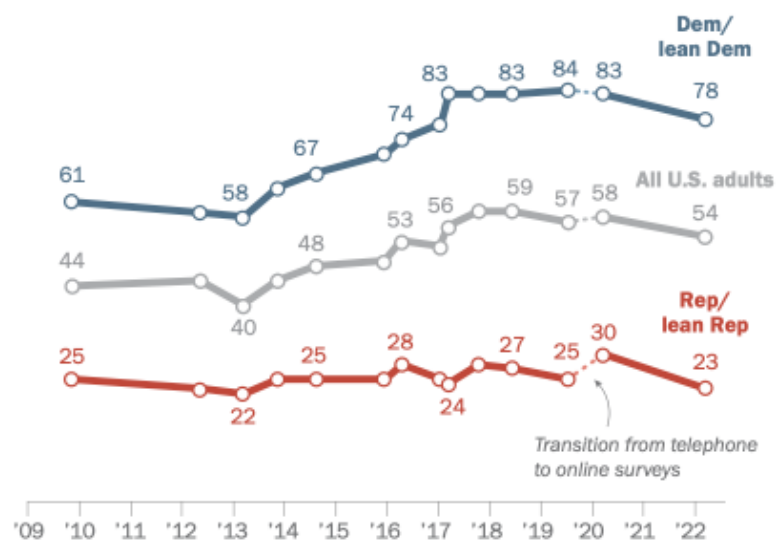
Global Warming's Six Americas, Fall 2023

Base: 1,033 U.S. adults

Source: Yale Program on Climate Change Communication;
George Mason University Center for Climate Change Communication

54% of Americans view climate change as a major threat, but the partisan divide has grown

% of U.S. adults who say global climate change is a major threat to the country



Note: Respondents who gave other responses or did not give an answer are not shown.
Source: Survey conducted March 21-27, 2022.

PEW RESEARCH CENTER

Outline for today

Is there a scientific consensus that...

- ...human-induced climate change is real?
- ...it is bad for people? For Ohio?
- ...we can do anything about it?

Is human-induced climate change real?

- The Claims

Burning fossil fuels has increased greenhouse gases in Earth's atmosphere

This, in turn, has increased Earth's global average temperature by $\sim 2^{\circ}\text{F}$

This trend is continuing at $\sim .5^{\circ}\text{F}$ per decade

This rate of change is unprecedented (not the change itself)

These changes threaten life on Earth *as we know it*

Source: climate.nasa.gov

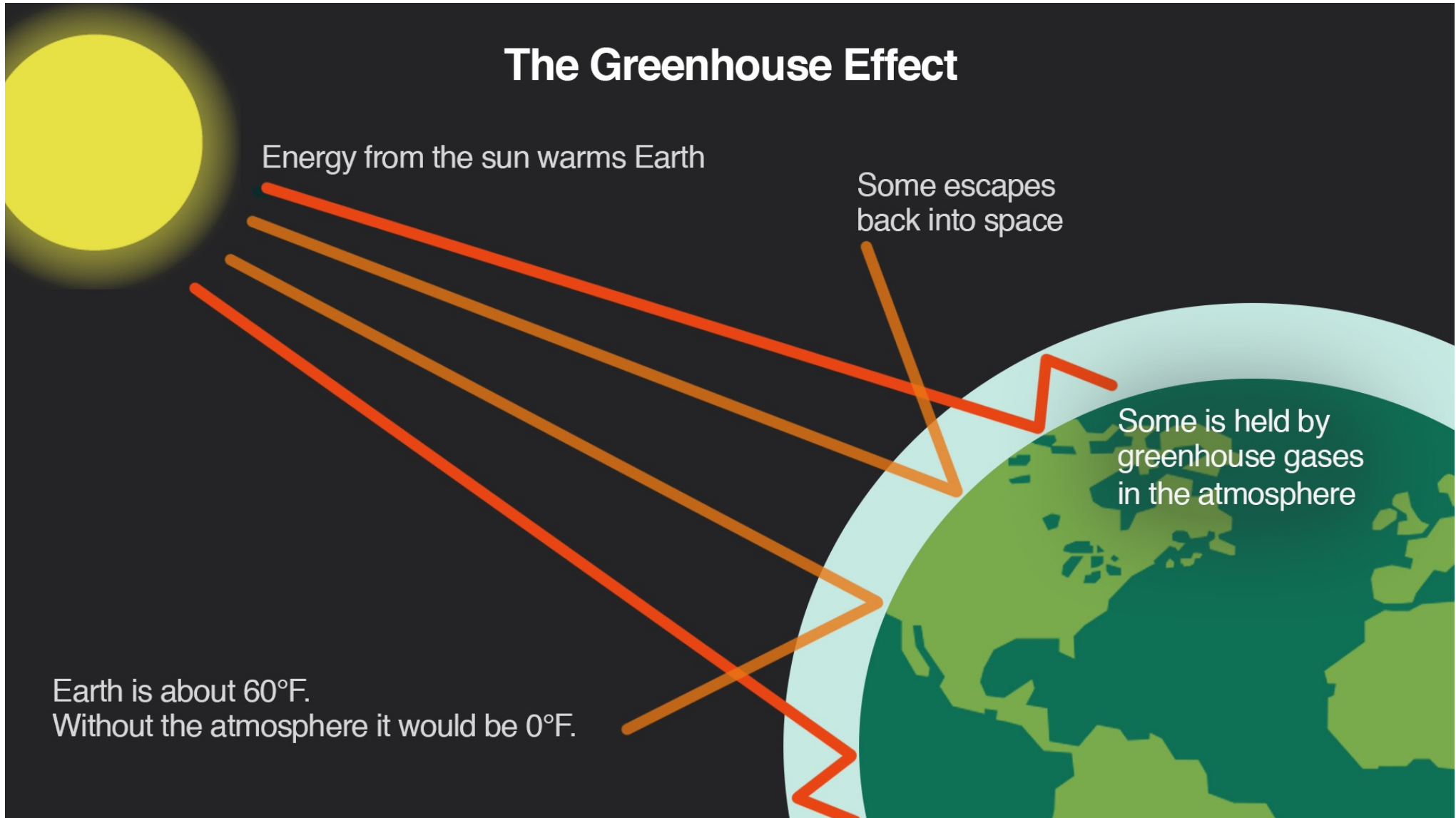
The Greenhouse Effect

Energy from the sun warms Earth

Some escapes
back into space

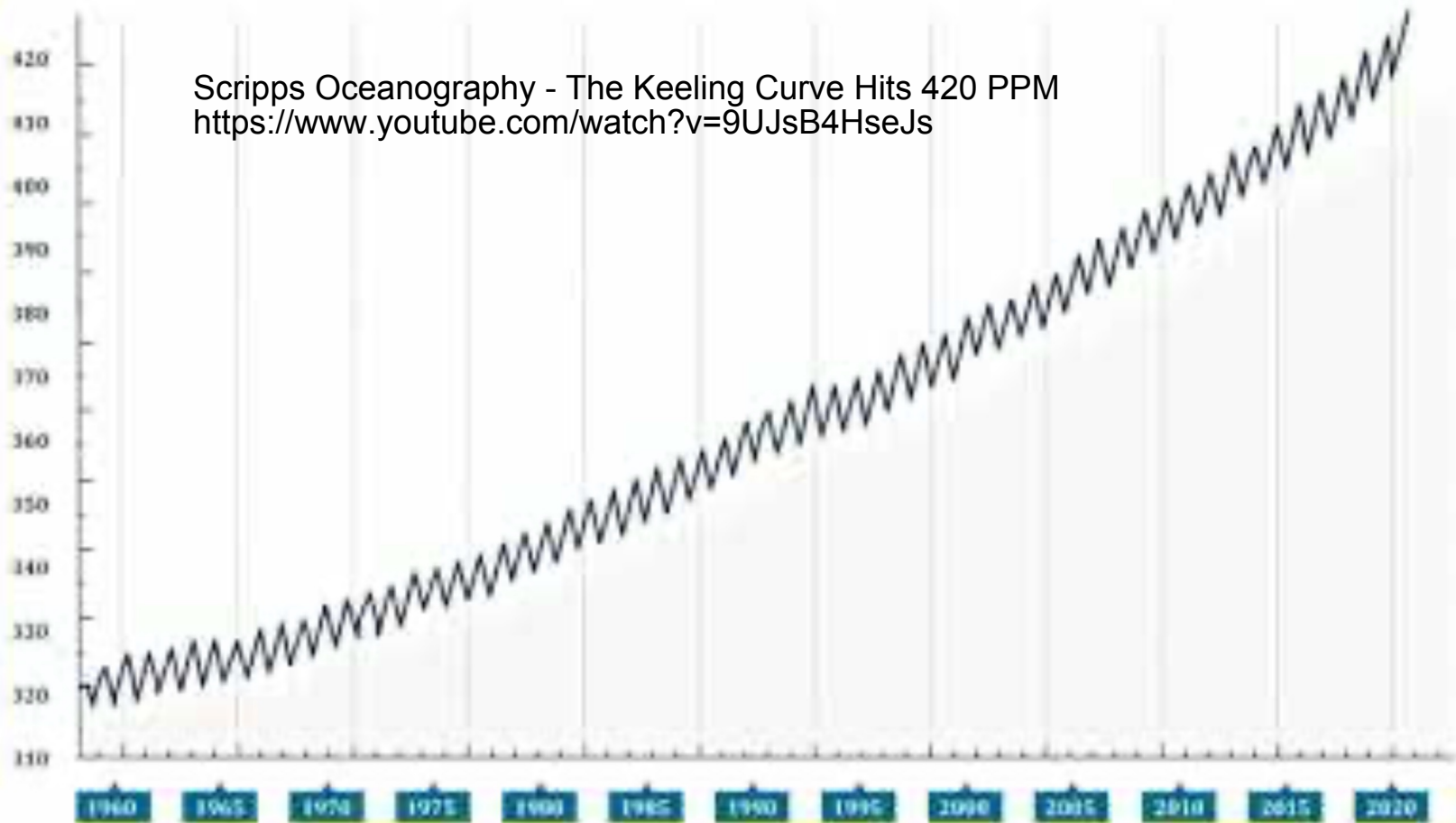
Some is held by
greenhouse gases
in the atmosphere

Earth is about 60°F.
Without the atmosphere it would be 0°F.



CARBON DIOXIDE CONCENTRATION AT MAUNA LOA OBSERVATORY

CO₂ Concentration (ppm)





The Pliocene

- 3-5 million years ago
- Sea levels 70 feet higher
- Giant camels in Indiana
- Forests on the North Pole

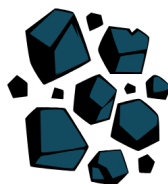
How do we know the current change is caused by us?

- The burning of fossil fuels produces carbon dioxide:
 - Transportation (cars, buses, planes)
 - Energy production (electricity, heating/cooling)
 - Manufacturing and production

> Oil

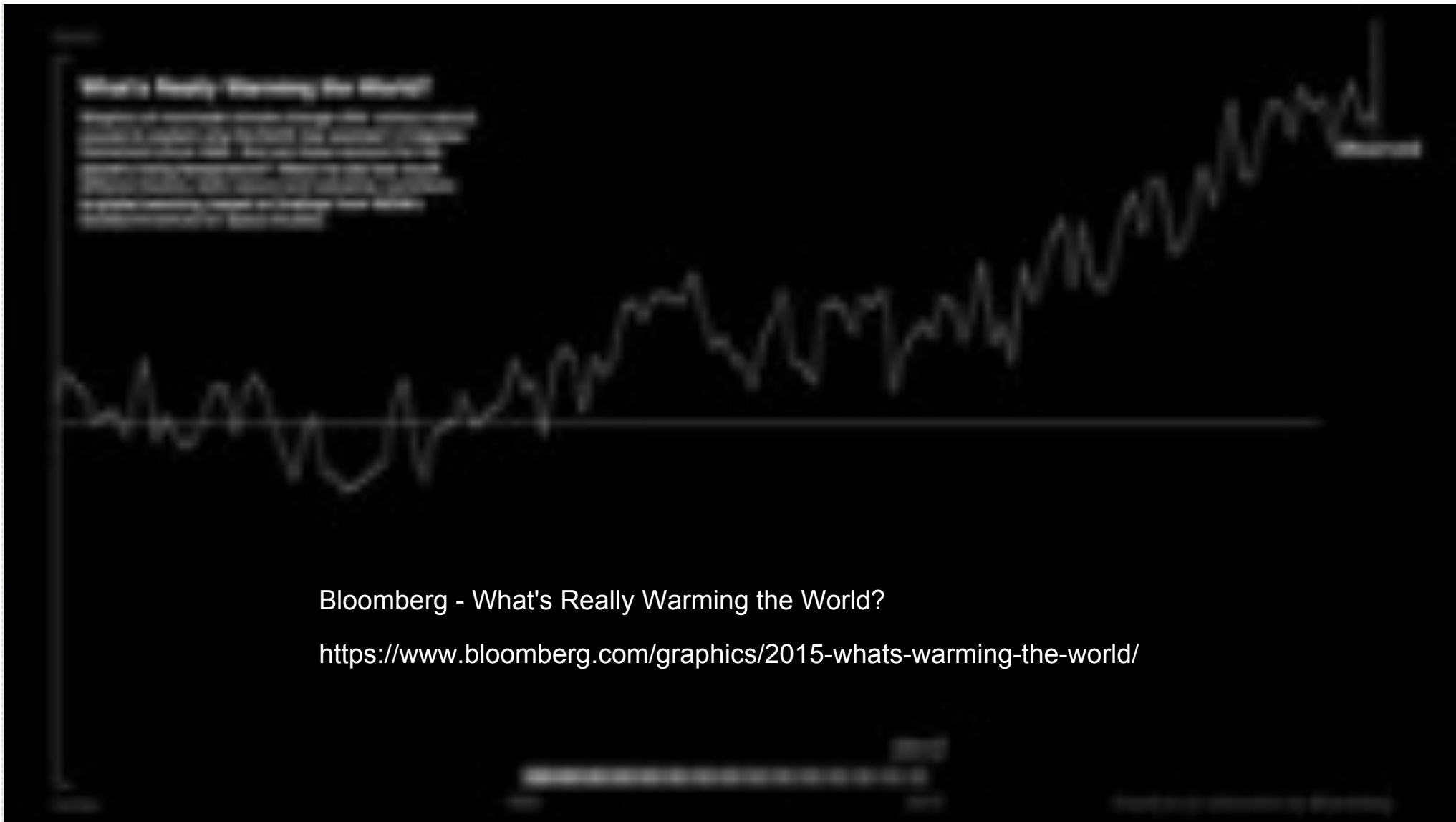


> Coal



> Natural Gas

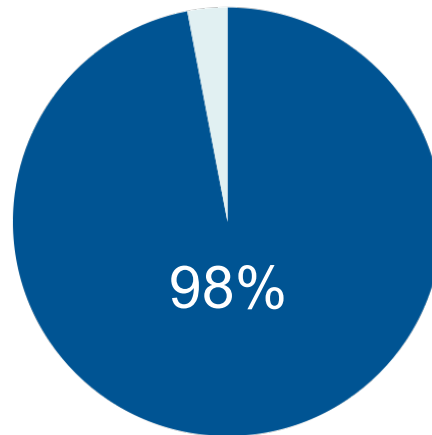




Bloomberg - What's Really Warming the World?

<https://www.bloomberg.com/graphics/2015-whats-warming-the-world/>

Based on the evidence, 98% of climate scientists have concluded that human-caused climate change is happening.

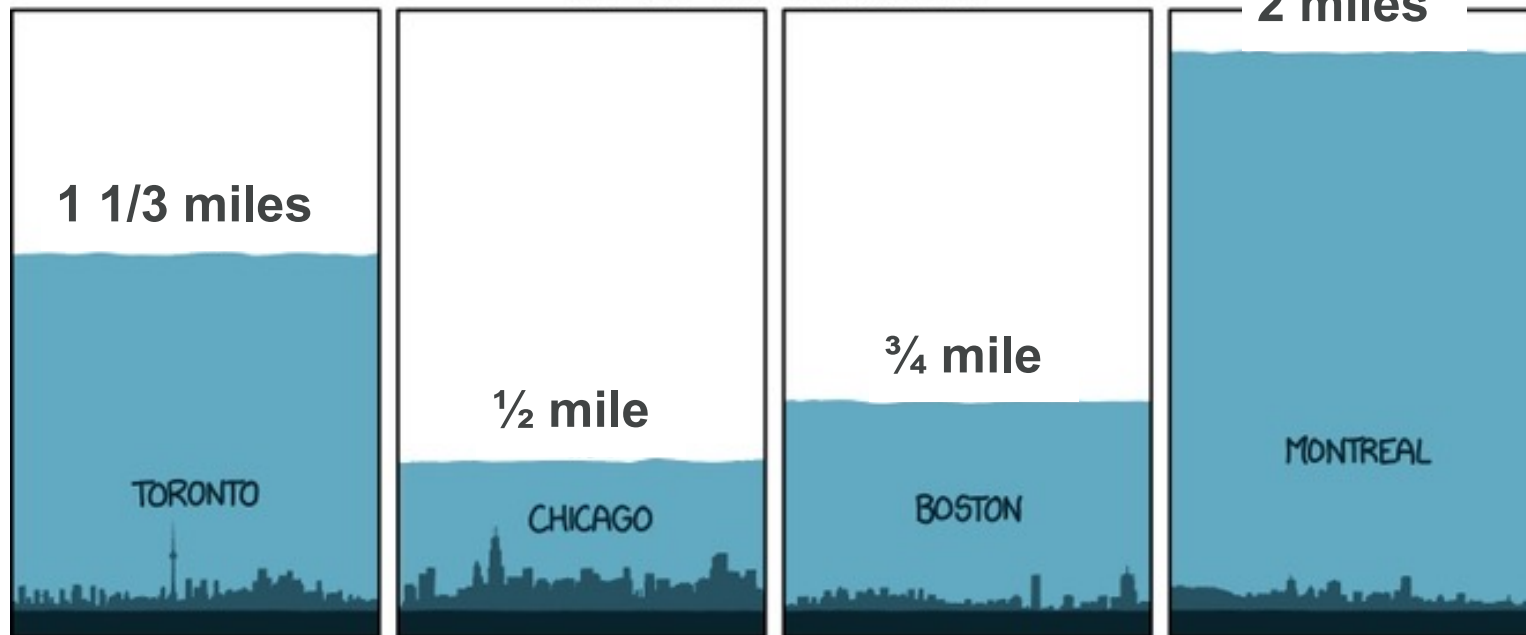




Is climate change bad for people?

- A .5° F global average increase every 10 years doesn't seem so bad
- Remember, that's the average...
- And global avg temps have been stable over most of human existence
 - In the last 10,000 years, global average temperatures ranged only 2°F warmer or 2° F cooler than today (i.e., 57 to 61 ° F)
- But small changes = BIG impacts
 - 20,000 years ago, global average temps were about 9° F cooler than today – and that caused the Ice Age!

THICKNESS OF THE ICE SHEETS AT VARIOUS LOCATIONS 21,000 YEARS AGO COMPARED WITH MODERN SKYLINES



Global Impacts...

30 million to 2 billion – *increase in people living in extreme heat by 2070*

2.5 miles per year – *average speed at which malaria mosquitoes are moving north*

210 million – *increase in people facing food insecurity since 2019*

21% in last 20 years – *loss in global ag production due to heat and drought*

489,000 vs 250,000 – *annual deaths from extreme heat vs firearms*

7 times – *increased likelihood that children today will experience extreme weather*

Source: The Heat Will Kill You First by Jeff Goodell

Rising Temperatures



2.3°F
1951-2012

Average Temperature

Average temperatures warmed by 2.3°F from 1951 through 2012, faster than the national and global rates. Models project this trend will continue, with temperatures rising approximately 3-5°F by mid-century.

Increasing Precipitation

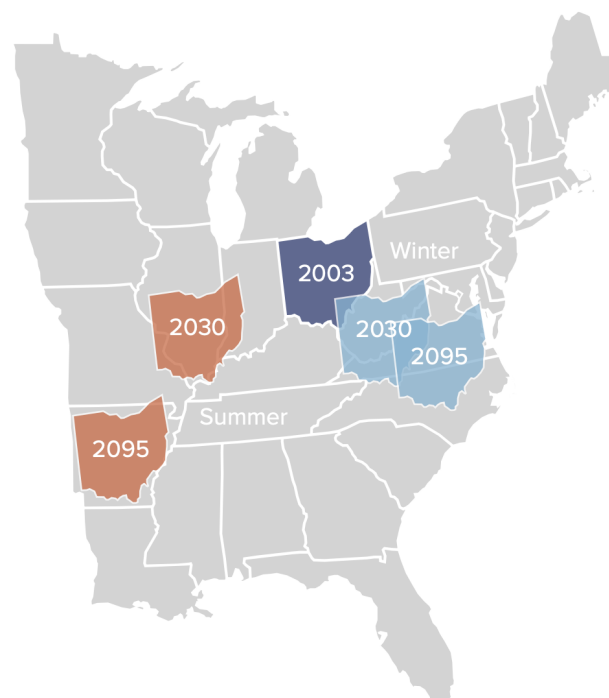


32%
1951-2012

Heavy Precipitation

Between 1951–1980 and 1981–2010, the number of very heavy precipitation events increased by 32%. The number of days per year that saw more than 1.25" of precipitation increased by 78% from 1951–2012.

How the Future Climate of Ohio Compares to Current Climates Elsewhere



Observed historical changes and changes likely to occur

Data from GLISA 2016 Report "Climate Changes and Impacts in Columbus, OH", Graphic from Columbus Climate Adaptation Plan

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In Ohio...

- More severe heat
 - Extreme heat is the leading cause of weather-related deaths in the US

The Columbus Dispatch

Heat wave: Try to keep your cool,
Columbus

Wednesday July 20, 2011 3:08 PM



Pickerington North football players, including freshman Frankie Weirick, right, take a water break during football camp at the high school. Shari Lewis

Source: Policy Matters Ohio

In Ohio...

- More severe heat
 - Extreme heat is the leading cause of weather-related deaths in the US
- More air quality issues
 - 6 Ohio cities among the 20 worst places to live with asthma

Source: Policy Matters Ohio

The Columbus Dispatch

'This is a big deal': Columbus-area air quality alert to remain in effect Thursday

Jack Nimesheim The Columbus Dispatch

Published 2:52 p.m. ET June 28, 2023 | Updated 11:34 a.m. ET June 29, 2023



In Ohio...

- More severe heat
 - Extreme heat is the leading cause of weather-related deaths in the US
- More air quality issues
 - 6 Ohio cities among the 20 worst places to live with asthma
- Stronger, more frequent storms
 - Flooding increases water contamination (GI illness, rashes, liver damage, etc)

Source: Policy Matters Ohio

The Columbus Dispatch

SEVERE

Ohio went from drought to flooding in a year. A tale of two Augusts



Amani Bayo

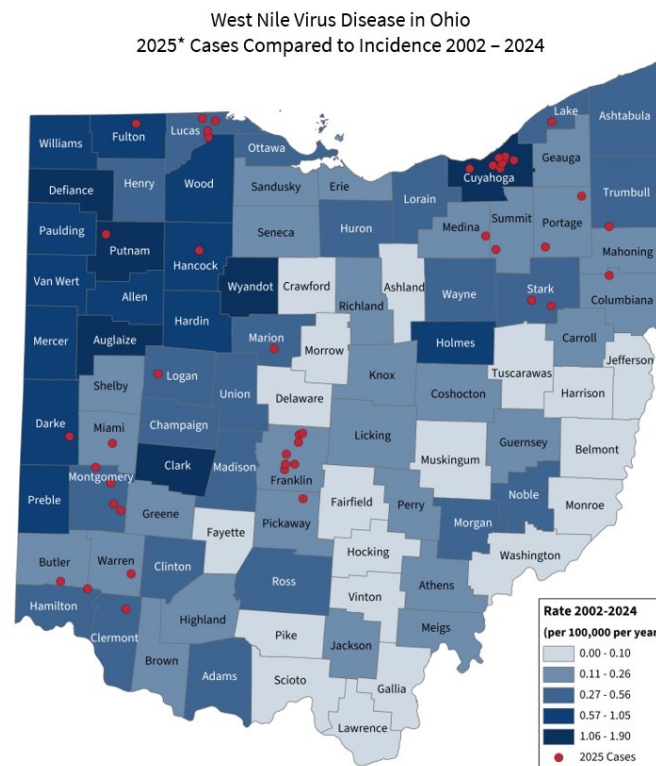
Columbus Dispatch

Aug. 25, 2026, 6:04 a.m. ET



In Ohio...

- West Nile Virus
 - Emerged in 2001, ~88 fatal cases in OH to date



Source: Ohio Department of Health.

* Data as of 11/19/2025, 45 cases.

County-level data are based on county of residence of the case.

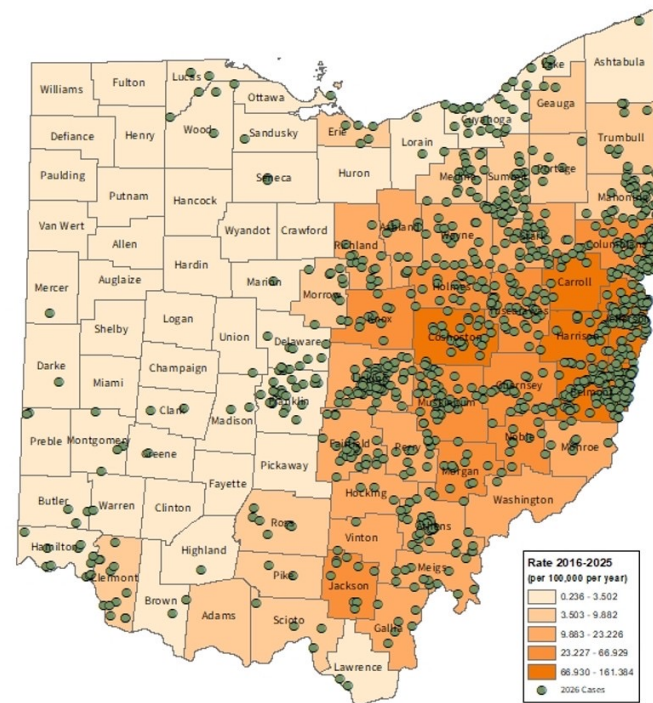
Source: Policy Matters Ohio

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In Ohio...

- West Nile Virus
 - Emerged in 2001, 81 fatal cases in OH to date
- Lyme Disease
 - Black legged deer ticks confirmed in OH in 2010

Lyme Disease in Ohio
2026* Cases Compared to Incidence 2016 – 2025



Source: Ohio Department of Health.

* Data as of 07/31/2026, 1,009 cases.

County-level data are based on the county of residence of the case.

Source: Policy Matters Ohio

Who gets hit the hardest?

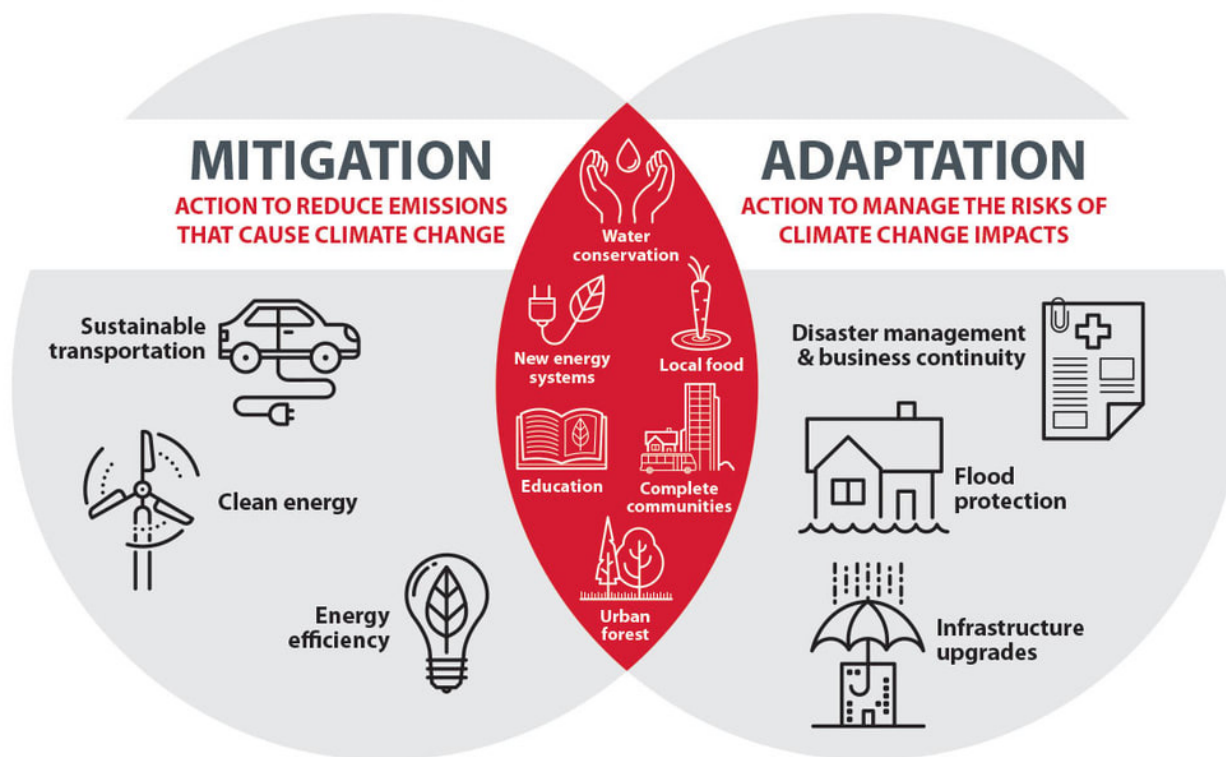
- Vulnerable populations most at risk:
- The poor, the very young and very old
- Those with mental and physical handicaps
- Those with chronic health conditions



Can we do anything about it?



Building Climate Resilience



Which of the following actions can YOU take to move us toward net zero by 2050?

- Reduce your carbon footprint

US average footprint is 16 tons (US avg)

Global average footprint is 4 tons (but needs to be 2 tons to reach climate goals)

- Reduce your climate shadow

e.g., Talk about climate change

e.g., Invest your money wisely

e.g., Vote carefully

e.g., Engage politically

Takeaways for today

- Human induced climate change is real
- Climate change is having (and will have) negative impacts on people in your communities and throughout Ohio
- We can do (and are doing) something about it...
- But we need to do more!



CLIMATE SUMMIT

WHAT IF IT'S
A BIG HOAX AND
WE CREATE A BETTER
WORLD FOR NOTHING?

- ENERGY INDEPENDENCE
- PRESERVE RAINFORESTS
- SUSTAINABILITY
- GREEN JOBS
- LIVABLE CITIES
- RENEWABLES
- CLEAN WATER, AIR
- HEALTHY CHILDREN
- etc. etc.



U.S.A.TODAY

JOEL PETT

©Joel Pett.

Thank you! **Wilson.1376@osu.edu**

For more information on the changing climate, expected impacts in the Midwest/Ohio, and paths forward, please visit:

Climate Science and Impacts

- Natl Climate Assessment CH 24 Midwest: <https://nca5.climate.us/>
- State Climate Office: <https://climate.osu.edu/>
- NOAA Climate Resources: <https://www.noaa.gov/climate>

And When You Just Need Some Good News!

- Climate Success Stories!: <https://www.dailyclimate.org/good-news/>

(actions continued on next slide)

Thank you! Wilson.1376@osu.edu

For more information on the changing climate, expected impacts in the Midwest/Ohio, and paths forward, please visit:

Taking Action

- **Columbus Greenspot Program:** <https://www.columbus.gov/Services/Columbus-Water-Power/About-Columbus-Water-Power/Sustainability-at-Columbus-Water-Power/GreenSpot>
- **UN Recommended Actions for a Healthy Planet:** <https://www.un.org/en/actnow/ten-actions>
- **The Climate Game: Can you reach net zero by 2050?:** <https://iq.ft.com/climate-game/>
- **How to Reduce Your Footprint, and Increase Happiness:** <https://happyclimate.org/>
- **EPA Carbon Footprint Calculator:** <https://www.epa.gov/ghgemissions/carbon-footprint-calculator>
- **How to Engage Others:** <https://www.katharinehayhoe.com/>
- **Buying Carbon Offsets:** <https://marketplace.goldstandard.org/collections/projects>
- **Resources to Support Home Electrification:** <https://www.electrifycentralohio.org/>

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