

# Climate Impacts - Ohio

- Climate Change Is Harming Ohioans' Health** **1**
- Extreme Heat **1**
- Extreme Weather Events Have Caused Thousands of Ohioans To Lose Power **3**
- Air Pollution **3**
- Water Pollution **4**
- PFAS Chemical Contamination **5**
- Coal Ash **5**
- Communities Most At Risk **6**
- Climate Change Is Harming Ohioans Safety** **7**
- Climate-Related Wildfire **7**
- Climate-Related Drought **7**
- Climate-Related Storms And Flooding **8**
- Climate Change is Harming Ohio's Economy** **9**
- Overall Impact **9**
- Tourism & Outdoor Recreation **9**
- Agriculture **10**

## Climate Change Is Harming Ohioans' Health

### Extreme Heat

- Ohio's annual average temperatures have [risen](#) by more than 1.5 degrees Fahrenheit since the beginning of the 20th century.
- In seventy years, Ohio is [expected](#) to have five to 15 more days per year with temperatures above 95 degrees Fahrenheit.
- By 2050, the average Ohio resident is [expected](#) to experience about 43 extremely hot days per year.

- By 2100, average summer temperatures in Ohio are [expected](#) to rise by up to 12 degrees Fahrenheit.
- By the year 2090, Hamilton County may have faced an upward of [18 days](#) a year with temperatures over 105°F, and Franklin County could see up to [15 days](#).
- Ohio's cities are experiencing more extremely hot days. From 1970 to 2022, [Canton](#) saw 23 more days above 85 degrees Fahrenheit, [Mansfield](#) saw 18 additional days, and [Cleveland](#) saw 14 more days.
- From 2018 to 2023, there were 102 [reported](#) heat-related fatalities in Ohio.
- Ohio suffers from the urban heat island effect.
  - Urban areas such as Dayton, Cincinnati, Cleveland and Columbus have the [potential](#) to become heat islands, a term used to describe communities that experience hotter temperatures than surrounding neighborhoods.
  - According to a 2024 report, [29,000 people](#) in Cleveland live in neighborhoods affected by an urban heat island effect of more than nine degrees compared to those living in nonurban areas.
  - According to a 2024 report, [26,000 people](#) in Columbus live in neighborhoods affected by an urban heat island effect of more than nine degrees compared to those living in nonurban areas.
  - According to a 2024 report, [23,000 people](#) in Cincinnati live in neighborhoods affected by an urban heat island effect of more than nine degrees compared to those living in nonurban areas.
- Ohio saw several broken heat records during the Summer of 2024:
  - Between June 1 and June 30, 2024, 29 highest daily maximum temperature records were [broken](#) in Ohio.
  - Between July 1 and July 31, 2024, 8 highest daily maximum temperature records were [broken](#) in Ohio.
  - Between August 1 and August 31, 2024, 45 highest daily maximum temperature records were [broken](#) in Ohio.
  - On August 28, 2024, the Cincinnati Municipal Airport Lunken Field [broke](#) a daily high record at 101 degrees.
- Ohio's aging population is especially vulnerable to extreme heat.
  - According to a 2024 study, nearly one in five older adults in central Ohio said they feel [unprepared](#) for emergencies or don't know if they are ready.

- As temperatures in Ohio continue to rise, air quality is [expected](#) to deteriorate as hotter weather causes more severe smog. This would have serious consequences for public health, including [increased](#) cases of asthma attacks and other respiratory conditions.

## Extreme Weather Events Have Caused Thousands of Ohioans To Lose Power

- In August 2024, more than [250,000 homes and businesses](#) were left without power in Ohio after severe storms and at least two tornadoes hit the northwestern portion of the state.
- Ohio [experienced](#) 41 heat season (May through September) power outages from 2000 to 2023.

## Air Pollution

- In Ohio, four counties, Cuyahoga, Hamilton, Lake, and Lucas, [received](#) an F grade for the number of high ozone days.
- In 2024, the Cleveland-Akron-Canton metropolitan area was [ranked](#) 31st for high ozone days, 73rd for 24-hour particle pollution, and 54th for worst annual particle pollution.
- In 2024, the Columbus-Marion-Zanesville metropolitan area [ranked](#) 79th for high ozone days and 78th for worst annual particle pollution.
- In 2024, the Cincinnati-Wilmington-Maysville metropolitan area [ranked](#) 42nd for high ozone days, 85th for worst 24-hour particle pollution, and 22nd for worst annual particle pollution.
- In 2024, the Toledo-Findlay-Tiffin metropolitan area [ranked](#) 36th for worst high ozone days.
- Columbus is [expected](#) to see an up to 28% drop in the number of clean air days per summer due to climate change-induced warming.
- In June 2024, smoke from wildfires in the western US and Canada spread hundreds of miles across the US and caused [“poor” levels of air quality](#) across Ohio.
- In June 2023, Northeast Ohio, including Ashtabula, Cuyahoga, Geauga, Lake, Lorain, Medina, Portage, and Summit counties, were [under air quality advisories](#) for dangerous levels of fine particulate matter caused by wildfires in California.

- On February 3, 2023, a Norfolk Southern train carrying tanks of hazardous materials [derailed](#) in East Palestine, Ohio. In the hours following the crash, the tanks were [exposed](#) to fire and released almost [1.1 million pounds](#) of vinyl chloride. 2,000 residents were [evacuated](#) after the crash.
  - Vinyl chloride is a toxic and flammable gas that can persist in the air, soil, and water for years. Exposure to the chemical, both acutely and chronically, has been [associated](#) with respiratory issues, liver injury, cardiovascular diseases, and cancer.
  - Residents close to the crash [reported](#) cases of rashes, nausea and headaches after the crash.
  - A 2024 study found that air pollution from the crash [spread](#) from the Midwest through the Northeast and as far south as North Carolina, impacting portions of a total of 16 states.
- In 2022, residents of Belmont County installed portable air sensors that found high levels of benzene, toluene, and fine particulate matter that [exceeded](#) standards set by the World Health Organization. Residents believed that the source of the pollution was nearby fracking operations.
- In 2023, the air quality index in the Dayton region [surpassed](#) 200 into the "very unhealthy" range due to Canadian wildfire smoke.
- As temperatures in Ohio continue to rise, air quality is [expected](#) to deteriorate as hotter weather causes more severe smog. This would have serious consequences for public health, including [increased](#) cases of asthma attacks and other respiratory conditions.
  - In 2021, 10.4% of adults in Ohio were [diagnosed](#) with asthma, and 124 deaths were attributed to asthma that year.
  - Ohio is ranked [33rd](#) in the country for cases of asthma in youth, with [7.1%](#) of children in the state having asthma.

## Water Pollution

- The East Palestine train derailment [occurred](#) 16 miles from the Ohio River and released butyl acrylate into nearby streams that flow into the Ohio River.
  - A year after the derailment, residents in East Palestine [claimed](#) contamination in local creeks was still visible.

- In May 2024, an Ohio man pleaded guilty to killing more than 40,000 fish after [dumping 7.00 gallons](#) of wastewater containing pollutants and hazardous substances into the Scioto River.
- In 2020, the EPA considered the Ohio River Basin, which provides drinking water for more than [five million people](#) including Ohio residents, one of the [most toxic](#) watersheds in the country.
- In 2017, an algal bloom in the Maumee River, which flows through downtown Toledo, [turned](#) the river fluorescent green.
- In 2014, more than 500,000 Toledo residents were under a water advisory after Lake Erie [tested positive](#) for high toxin levels caused by an algae bloom.
- In the Great Lakes, warmer waters and changes in ice cover can [lead to](#) more frequent invasive species that can decrease water quality and create more toxins.

## PFAS Chemical Contamination

- A 2021 report from the Ohio EPA [found](#) that 106 water systems had detectable levels of PFAS chemicals in groundwater wells or drinking water.
  - In January 2024, the Dayton city government [approved](#) a multi-million dollar plan to reduce PFAS levels in the city's drinking water systems after a 2023 investigation found at least 15 public water systems serving over 140,000 customers, where PFAS levels [exceeded](#) the EPA's PFAS limits.

## Coal Ash

- Ohio has 67 coal ash dump sites [leaking](#) pollution into groundwater across the state.
  - Ohio's largest coal-fired power plant, the James M. Gavin Power Plant, has been sent notices several times for excessive sulfur dioxide emissions. In 2002, Cheshire, Ohio, [experienced](#) sulfur rain as a result of the plant's pollution.
  - The plant was found to have Lithium levels that were [17 times](#) higher than the EPA's safe drinking water standards. Cobalt tested [23 times](#) higher, lithium tested [17 times](#) higher, Molybdenum was [six times](#) higher, arsenic was [three times](#) higher, boron tested [two times](#) higher, and lead tested [two times](#) higher than the standard.
- Coal ash [contains](#) chemicals known to cause cancer, neurological damage, or heart ailments and is stored in sites at risk of spilling into nearby rivers and lakes under flood conditions.

## Communities Most At Risk

- Ohio suffers from the urban heat island effect.
  - According to a 2024 report, [29,000 people](#) in Cleveland live in neighborhoods affected by an urban heat island effect of more than nine degrees compared to those living in nonurban areas.
  - According to a 2024 report, [26,000 people](#) in Columbus live in neighborhoods affected by an urban heat island effect of more than nine degrees compared to those living in nonurban areas.
  - According to a 2024 report, [23,000 people](#) in Cincinnati live in neighborhoods affected by an urban heat island effect of more than nine degrees compared to those living in nonurban areas.
- Northeast Ohio, including Cuyahoga and Lorain counties, was [named](#) a “hot spot” of environmental injustice.
  - The EPA tracked 130 toxic release facilities in Cuyahoga County and found that they [released](#) a combined 6,972,614 pounds of 77 separate toxic chemicals into the environment in 2022.
  - The MPC plastic plating facility had the [highest risk score](#) due to moving 38,953 pounds of chromium and chromium compounds off-site or releasing them into the air.
    - Chromium and chromium compounds have been [associated](#) with causing cancer and gastrointestinal, hematological, and respiratory issues.
  - According to a 2018 report, communities of color made up [91%](#) of the residents within a one-mile radius of the Cleveland Hough neighborhood. This neighborhood was in close proximity to three industrial facilities that emitted an annual total of [40 million tons](#) of highly toxic air pollution, causing a disproportionate health risk to local residents.
- The Cincinnati area was ranked the [22nd most polluted](#) U.S. metropolitan area for year-round particle pollution levels. .
  - According to the U.S. Census Bureau, [39.6%](#) of Cincinnati residents are Black and [4.6%](#) are Hispanic.
  - Black people are [three times](#) more likely to die from air pollution than white people.
  - Latino communities [breathe in](#) 75% more air pollution from vehicles than white residents, the most of any demographic group.

# Climate Change Is Harming Ohioans Safety

## Climate-Related Wildfire

- As of September 8th, 2024, 483 wildfires have [burned](#) more than 1,077 acres across Ohio.
  - In 2023, 2,469 acres of land were [burned](#) in 883 wildfires in Ohio.
  - In 2022, 3,063 acres of land were [burned](#) in 724 wildfires in Ohio.
  - In 2021, 1,415 acres of land were [burned](#) in 524 wildfires in Ohio.
  - In 2020, 1,551 acres of land were [burned](#) in 649 wildfires in Ohio.
  - In 2019, 1,038 acres of land were [burned](#) in 498 wildfires in Ohio.
- In June 2024, smoke from wildfires in the western US and Canada spread hundreds of miles across the US and caused [“poor” levels of air quality](#) across Ohio.
- In June 2023, Northeast Ohio, including Ashtabula, Cuyahoga, Geauga, Lake, Lorain, Medina, Portage, and Summit counties, were [under air quality advisories](#) for dangerous levels of fine particulate matter caused by wildfires in California.
- Increased temperatures and dry spells are projected to [increase the risk of wildfires](#) in the Midwest which would risk bringing increased wildfire smoke and worsened air quality to Ohio communities.

## Climate-Related Drought

- In 2024, for the first time in over 20 years, the Ohio River Valley was under [exceptional drought conditions](#).
  - The USDA [declared](#) 22 Ohio counties “Primary Natural Disaster Areas” due to severe drought levels.
  - In August 2024, [63%](#) of the state was considered abnormally dry or worse, and 12% was in extreme drought.
  - In July 2024, nearly [six million Ohioans](#) were living in areas with drought conditions.

## Climate-Related Storms And Flooding

- Ohio has [experienced](#) an increase in the number of two-inch extreme precipitation events since the mid-1990s.
- In 2020, over [400 thousand people](#) lived in areas that were at an elevated risk of flooding.
- In the past fifty years, rainfall during Ohio's four wettest days of the year has [increased](#) by about 35%.
- Ohio cities are expected to experience more high-precipitation events.
  - Cincinnati has [experienced](#) an average of 1.4 inches of rain about 11 times per year. In 2050, it is [projected](#) to experience an average of 1.3 inches of rain about 13 times per year.
  - Canton has [experienced](#) an average of 1.2 inches of rain about 11 times per year. In 2050, it is [projected](#) to experience an average of 1.1 inches of rain about 14 times per year.
- In the past decade, Ohio has experienced 28 billion-dollar storms responsible for at least \$83.3 billion in damages and 77 deaths.
- Ohio currently [experiences](#) an estimated \$1 billion in annual flood loss. This is expected to increase by 4% by 2050.
- In the past decade, Ohio has experienced 11 billion-dollar climate-related tornado outbreaks responsible for at least \$36.8 billion dollars in damages and 171 deaths.
  - In 2023 and 2024, Ohio saw rare and deadly February tornadoes.
    - On February 27, 2023, five tornadoes were [recorded](#) in Franklin County, causing significant damage to homes and businesses.
    - On February 28, 2024, eight tornadoes [caused](#) significant damage between Dayton and Newark.
- Spring and winter rainfall in Ohio is [projected](#) to increase by up to 30% by the end of the century.



# Climate Change is Harming Ohio's Economy

## Overall Impact

- In the past decade, Ohio has experienced 48 billion-dollar weather and climate disasters responsible for at least \$158.2 billion in damages and 500 deaths.
- Drought [causing](#) fluctuating water levels in Lake Erie, which is expected to slow down water-based shipping channels.
- A 2022 report [estimated](#) that the state of Ohio would need to increase municipal spending by between \$1.8 billion to \$5.9 billion per year by 2050 to adapt to the worsening challenges of climate change.
  - By 2050, the statewide cost to implement stormwater management features to handle heavier and more frequent precipitation events in Ohio is [estimated](#) to cost between \$140 million to \$150 million per year.
  - By 2050, Ohio would [need to spend](#) between \$860 million to \$1.7 billion per year to elevate roads to account for climate change-induced flooding.
  - By 2050, air conditioning for Ohio schools to combat high heat days is [estimated](#) to cost between \$1.4 million to \$6.8 million per year.
  - By 2050, the statewide additional cost to protect water supplies from toxic algae in Lake Erie is [estimated](#) to reach \$580 million to \$2.2 billion per year.
  - By 2050, Ohio is [expected](#) to spend \$35 million to \$78 million per year in recovery and cleanup costs after extreme weather events.
  - By 2050, increased storm severity and frequency is [expected](#) to cost Ohio communities \$140,000 to \$18 million per year to protect power lines.

## Tourism & Outdoor Recreation

- In 2023, [238 million visitors](#) generated [\\$56 billion](#) in spending and indirect business sales in Ohio.
- Visitors to the state also generated [\\$4.6 billion](#) in state and local taxes in 2023 and supported nearly [436,000 direct and indirect jobs](#).
- Outdoor recreation in Ohio [supports](#) 154,668 jobs, \$17.2 billion in consumer spending, and [contributes](#) 2.1% of the state's GDP.

- National parks are [crucial](#) to Ohio's economy. In 2023, 3.2 million visitors to the state's parks spent approximately \$164 million and supported a total of 2,530 jobs.
- From 1960 to 2020, Northwest Ohio saw about [seven more](#) inches of annual precipitation. More severe precipitation events and increased temperatures pose a threat to Ohio's parks.
  - In 2022, the Cuyahoga Valley National Park [saw](#) 2.9 million visitors, bringing in \$56 million of spending and supported 778 jobs.
  - Climate change-induced warming is expected to lead to increased visitation to the trails during the spring and fall which [adds pressure](#) to park resources and can deteriorate the trails.
  - More frequent and intense storms mean more erosion along the banks of the Cuyahoga river, [damaging](#) infrastructure and trails and causing millions of dollars in repair costs.
- Warmer winters mean less predictable snowfall in Ohio's Cuyahoga Valley, [threatening](#) the state's winter sports and recreation industry.
  - In 2018, the National Park Service [moved](#) the Winter Sports Center from Ohio's Kendall Lake Shelter to Boston due to inadequate snowfall.
  - The Ohio Winter Special Olympics [moved](#) its cross-country skiing events out of Ohio's Cuyahoga Valley due to decreased snowfall.
- Increasing temperatures are [expected](#) to alter Ohio's fish habitats, negatively impacting recreational and commercial fishing and hunting.
  - From 2010 to 2020, revenue for Ohio's Lake Erie Charter industry [increased](#) by roughly 50% to a total of \$14.6 million in 2020.
  - As climate change-induced warming continues, changes in maximum ice cover will cause milder winters, which will [hurt](#) young fish's chances of survival into adulthood.

## Agriculture

- One out of every seven Ohioans is [employed](#) in the agricultural sector, and [50%](#) of Ohio land is dedicated to agriculture.
- Food and agriculture is the [No. 1](#) industry in Ohio and adds more than [\\$124 billion](#) to the economy each year.

- As temperatures in Ohio continue to rise, crops and livestock are [expected](#) to face more heat stress, decreasing crop yields and livestock productivity.
- Severe droughts during the summer of 2024 [caused](#) a hay shortage. Farmers [expressed concerns](#) that without improved conditions, they would have to resort to early marketing of beef calves or culling animals to manage the dwindling resources.
  - Severe drought conditions were concentrated in Southeast Ohio, [negatively affecting](#) the performance of crops like soybeans and corn.
- According to the USDA, in 2022, corn and soybeans [accounted](#) for the majority of crops planted and harvested and the value of crop production in Ohio. As the number of days over 105°F in Ohio is expected to increase by the end of the century, it will pose a direct threat to the agricultural economy in many parts of the state.