

environment

HOW OUR REGION'S AIR AND WATER QUALITY AND CLIMATE CHANGE IMPACTS AFFECT OUR ENVIRONMENT, HEALTH AND FUTURE WELL-BEING

Fundamental to our existence are clean air, potable water, and temperatures being “just right” on Earth. And while eight billion people share this planet, most environmental impacts are felt locally — and unevenly.

Houston used to be known as the nation’s smog capital in the 1990s, but our region has made significant strides to clean its air. And it has been working — air and water quality in Houston’s three-county region has improved over the last couple decades. However, they remain at levels that can still harm public health, particularly for people of color, low-income communities, older adults, children, and people with special medical needs. Toxic chemicals can be found in our air, water, and land, affecting our collective health, however, communities of color are disproportionately harmed.^{1,2} People of color are over three times more likely to be breathing the most polluted air than white people across the country.³

Air pollution caused by growing industries, heavy traffic and a car-dependent culture remain a persistent problem for the Houston region. The number of days in which ozone levels were above EPA standard fell 64% in Harris County and 77% in Montgomery County between 2000 and 2020. However, they remain high compared to other places — the American Lung Association graded the ozone levels in Harris and Montgomery an “F” in its 2021 State of the Air report.⁴ Despite the amount of particulate matter in the three-county area being below the National Ambient Air Quality Standards, they remain higher than national rates. High levels of ozone and particle pollution have been found to lead to premature death and other health conditions like cancer, asthma attacks, cardiovascular damage, developmental and reproductive damage.⁵

Contaminated water also poses serious health threats for residents and the environments they live in.⁶ About two-thirds of water streams in Houston’s three-county region

are contaminated by bacteria, making their water unsafe. And while it can be difficult to assess the total population impacted, nearly 1,600 drinking water violations were reported from Harris County’s active facilities in 2020.

Simultaneously, Houston has become hotter and wetter than it was a decade ago, an effect of climate change primarily caused by greenhouse gases that trap heat from the sun in our atmosphere. Extreme heat is the number one killer from America’s weather-related disasters.⁷ One under-recognized challenge in Houston is the urban “heat island” effect which makes temperatures much hotter in some neighborhoods within the same city.⁸ These pockets of trapped heat cause nighttime temperatures to remain elevated which is the greatest driver of heat-related health issues. Because low-income communities and communities of color are more likely to live in areas classified as heat islands, they not only bear “excessive environmental risk” but also they are disproportionately harmed by heat islands and other effects of climate change.⁹

Houston’s location, topography, and local climate also make us particularly vulnerable to extreme weather conditions such as flooding, storms, and hurricanes, which will continue to occur at greater intensities and with more frequency.¹⁰ Houston could face significant precipitation extremes in the future - more intense rainstorms and longer dry periods.¹¹ As our region continues to experience the effects of climate change, the role of renewable energy sources grows more important, particularly since Texas produces a larger share of its energy from renewables than the nation does.

The more we know about our local air and water quality and how climate change will continue to impact our region, the more we can do to make the adjustments necessary for a more livable future, particularly for our residents who bear the greatest risks.

2 Subtopics of Environment

CLIMATE CHANGE & RENEWABLE ENERGY

Houston is hotter and wetter

Average temperatures in the region increased between 0.6 to 1.0 degrees Fahrenheit and annual rainfall increased by about two inches compared to the three decades ending in 2020 versus 2010.

0.6 — 1.0°F



23%



Texas is a leader in wind power production, a renewable energy source. The share of power produced from renewable sources in Texas (23%) is nearly double that of the nation (12%).

AIR & WATER QUALITY

67%

of water streams are impaired

due to bacterial contamination and are unsafe for human consumption or exposure.

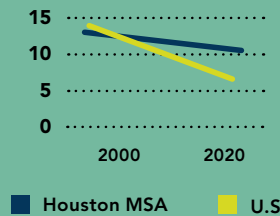


high ozone days

The number of days in which ozone levels were above EPA standard fell 64% in Harris County and 77% in Montgomery County between 2000 and 2018.

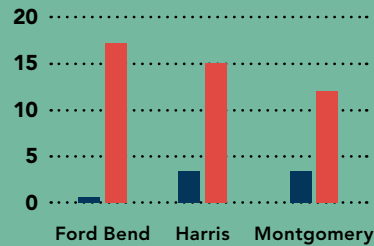
PARTICLE POLLUTION (PM_{2.5})

PM_{2.5} levels fell from 13.1 µg/m³ to 10.1 in the Houston MSA, reflecting a 23% improvement in air quality. National PM_{2.5} levels declined by 41%.



Trend over time:
 Compared to nation:

EXTREME RAIN



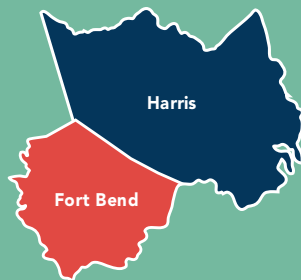
Days with 3 inches or more of rain: 1980s vs. 2010s

■ 1980s ■ 2010s

Trend over time:
 Compared to nation:

ENVIRONMENTAL JUSTICE

Fort Bend and Harris counties perform worse than other Texas counties on eight out of nine environmental justice indices related to air and water, meaning **people of color and low-income communities are disproportionately harmed by pollution.**



Trend over time:
 Compared to nation:

DRINKING WATER VIOLATIONS

There were **2,258 drinking water violations** across the three-county area in 2020.

Fort Bend = 91
 Harris = 1,595
 Montgomery = 572



Trend over time:
 Compared to nation:

TOXIC CHEMICALS

↓ 23%



The three-county Houston area reduced the amount of toxic chemicals released on-site by 23.4% from nearly 50.1 million pounds to 38.8 million pounds between 2005 and 2019, respectively.

Trend over time:
 Compared to nation:

EXTREME HEAT

Days above 95°F in the decade ending in 2010 vs 2020

Fort Bend = 478
 Harris = 436
 Montgomery = 523



The equivalent of more than one year of the last decade was above 95°F.

Trend over time:
 Compared to nation:

references

environment

¹ Bullard, R. D. (1983). Solid waste sites and the black Houston community. *Sociological inquiry*, 53(2-3), 273-288.

² Bullard, R. D. (Ed.). (1993). *Confronting environmental racism: Voices from the grassroots*. South End Press.

³ American Lung Association, State of the Air Report (2021) - Key Findings.

⁵ U.S. Environmental Protection Agency, "Ground-level Ozone Pollution - Health Effects of Ozone Pollution," last modified May 5, 2021.

⁴ Ibid

⁶ U.S. Environmental Protection Agency, Why Urban Waters?

⁷ Sarofim, M.C., S. Saha, M.D. Hawkins, D.M. Mills, J. Hess, R. Horton, P. Kinney, J. Schwartz, and A. St. Juliana. 2016. Chapter 2: Temperature-related death and illness. In: The impacts of climate change on human health in the United States: A scientific assessment. U.S. Global Change Research Program. <https://health2016.globalchange.gov>.

⁸ EPA, Heat Island Effect

⁹ EPA, Heat Islands and Equity

¹⁰ Stoner, A. and Hayhoe, K. 2020. *Climate Impact Assessment for the City of Houston*.

¹¹ HARC, Resilience Science Information Network.

DATA SOURCES

SUBTOPICS

Climate Change: National Oceanic and Atmospheric Administration, U.S. Climate Normals

Renewable Energy: U.S. Energy Information Administration

Water Quality: Houston Galveston Area Council, by request

Air Quality: CDC, National Environmental Public Health Tracking Network

INDICATORS HIGHLIGHTED

Particle Pollution: EPA, National Air Quality: Status and Trends of Key Air Pollutants; EPA: Air Quality - Cities and Counties

Environment Justice: EPA, EJSCREEN

Toxic Chemicals: EPA, Toxics Release Inventory

Extreme Rain: CDC, National Environmental Public Health Tracking Network

Drinking Water Violations: EPA, SDWIS Fed Reporting Services system

Extreme Heat: CDC, National Environmental Public Health Tracking Network