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Environmental Injustice

Earth Day 2025

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Introduction

According to the Environmental Protection Agency, environmental justice is the "*just treatment and meaningful involvement of all people, regardless of income, race, color, national origin, Tribal affiliation, or disability, in agency decision-making and other Federal activities that affect human health and the environment so that people: 1) are fully protected from disproportionate and adverse human health and environmental effects (including risks) and hazards, including those related to climate change, the cumulative impacts of environmental and other burdens, and the legacy of racism or other structural or systemic barriers; and 2) have equitable access to a healthy, sustainable, and resilient environment in which to live, play, work, learn, grow, worship, and engage in cultural and subsistence practices.*"

- Sources: Environmental Protection Agency. (2024, November 5). *Learn about environmental justice*. https://19january2025snapshot.epa.gov/environmentaljustice/learn-about-environmental-justice/index.html and Holifield, R. (2001). Defining environmental justice and environmental racism. *Urban Geography*, 22(1), 78–90. https://doi.org/10.2747/0272-3638.22.1.78

This report explores the burden of environmental injustice across many contexts. Expensive and deadly climate disasters underscore the tangible devastation on human lives and on the planet. Instead of protections from disproportionate adverse impacts, businesses and governments endanger low-income or underserved communities. Those in power concentrate risk into sacrifice zones and fenceline communities—areas with geographic proximity to pollution or waste sites—where the air is poison and the water is toxic. Moreover, when food is wasted, it not only worsens the climate crisis, it also deepens the hunger crisis in low-income or underserved communities.

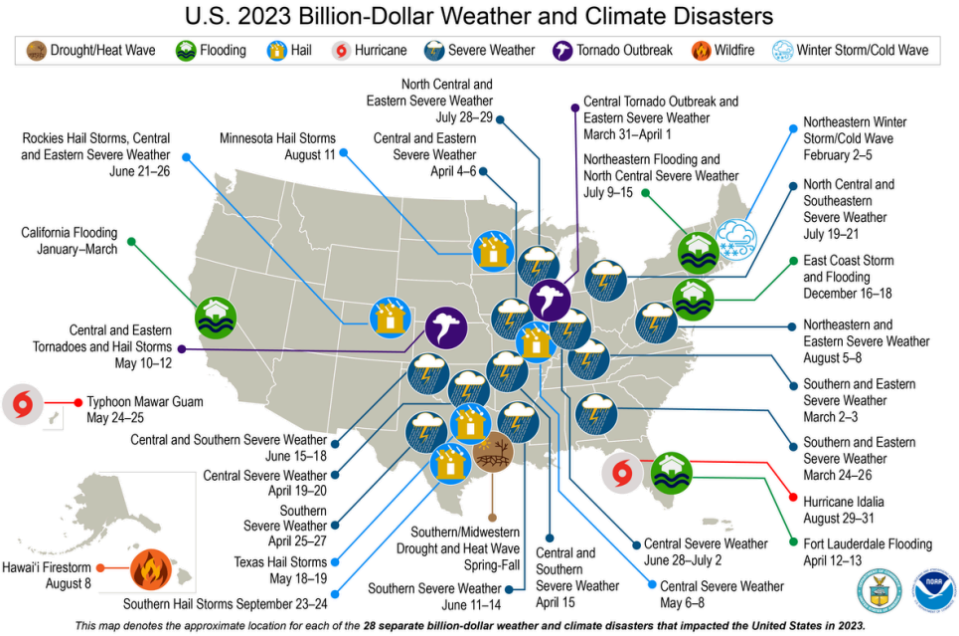
While structural change is urgently needed, the situation is not without hope. The report shows actions individuals can take, as well as inspirational women and girls finding creative solutions and leading the way.

The Cost of Climate Disasters

- Most of us either know someone who has experienced, or personally experienced ourselves, the fierce effects of climate disasters growing more intense over time.

- *"Almost every part of the U.S. has been touched by disaster: Nine out of 10 counties experienced a flood, fire, windstorm, or other disaster severe enough to merit federal assistance between 2011 and 2021… Even that estimate is too low, since it excludes two major climate events: heat and drought. Because heat waves don't cause property damage, they don't trigger federal disaster declarations, and federal spending on drought primarily covers major impacts to crop production."*
    - Source: Bittle, J. (2022, November 16). 9 in 10 US counties have experienced a climate disaster in the last decade, report finds. *Grist*. https://grist.org/extreme-weather/ninety-percent-counties-weather-climate-disaster-atlas-fema

- Each year, almost all regions of the US are affected by these destructive and expensive climate disasters.



  - Source: Smith, A. B. (2024, January 8). *2023: A historic year of U.S. billion-dollar weather and climate disasters*. NOAA Climate.gov. https://www.climate.gov/news-features/blogs/beyond-data/2023-historic-year-us-billion-dollar-weather-and-climate-disasters

- Locally, extreme effects impact New York City:
  - *"The remnants of Hurricane Ida barreled through the New York metro area, dropping historic rainfall on the five boroughs, overwhelming the city's sewer systems, and swamping low-lying areas across the city. All told, the storm killed 50 people in New York and New Jersey: some were trapped in their cars on waterlogged roadways, while others couldn't escape flooded unregulated basement apartments. Within a single hour, 3.15 inches of rain had fallen, breaking a record set just 11 days earlier, when 1.94 inches fell."*
    - Source: Hogan, G. (2022, September 1). NYC marks a year since Ida, with wounds still fresh for many. *Gothamist*. https://gothamist.com/news/nyc-marks-a-year-since-ida-with-wounds-still-fresh-for-many
    - Source: Reuters. (2021, September 2). *"Historic," deadly flooding hits U.S. northeast* [Video]. YouTube. https://www.youtube.com/watch?v=BFQkHSOO88M
  - *"The Bronx and Kings counties have high risk of climate disasters and other compounding risks."*
    - Source: Chester, A., & Lawton, J. (2022). Atlas of disaster. In *Rebuild by Design*. Rebuild by Design.

https://rebuildbydesign.org/wp-content/uploads/2023/04/ATLAS-OF-DISASTER-compressed.pdf

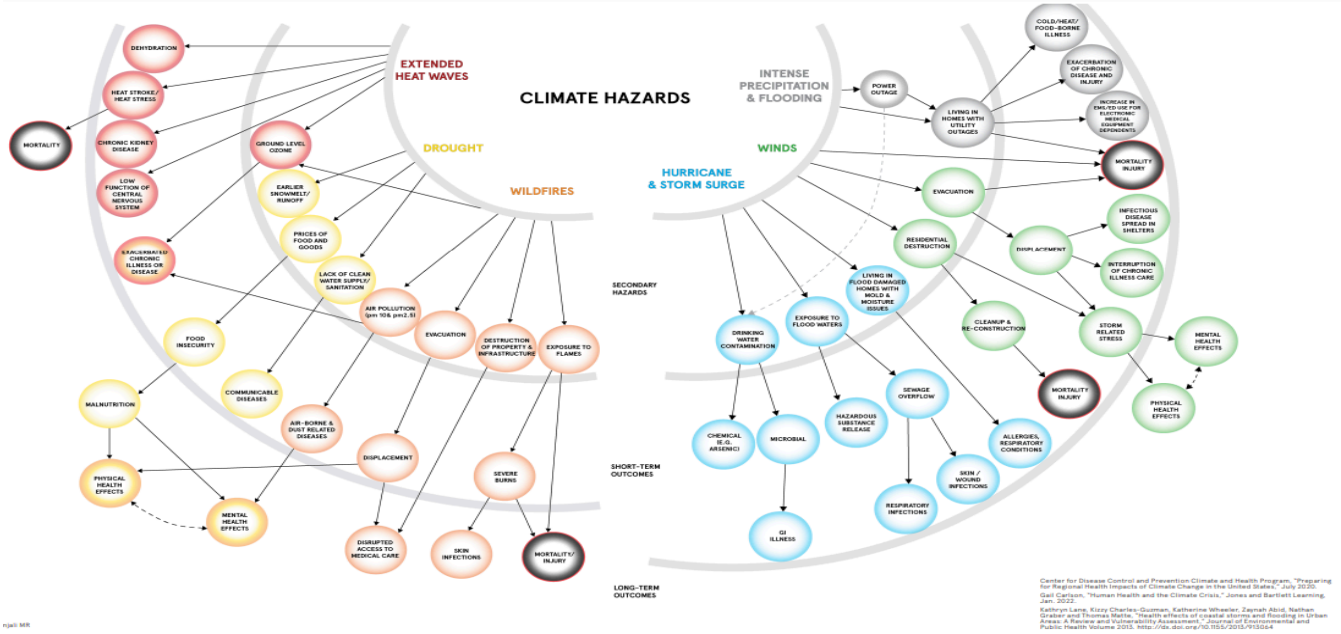
- Why are climate disasters getting worse? Climate change, driven by global warming, made worse by pollution.
    - *"As global temperatures climb, widespread shifts in weather systems occur, making events like droughts, hurricanes, and floods more intense and unpredictable. Extreme weather events that may have hit just once in our grandparents' lifetimes are becoming more common in ours."*
        - Source: Lindwall, C. (2022, October 24). *What are the effects of climate change?* Natural Resources Defense Council. https://www.nrdc.org/stories/what-are-effects-climate-change

- Inaction on climate change is monetarily expensive.
    - *"Many of us tend to think that we're still immune to the direct effects of the climate crisis, but make no mistake — those effects are already here, and they're hitting our wallets.*
      1) Grocery bills: Searing heat and other extreme weather hurt crops and livestock around the globe, driving up food costs in a phenomenon known as "heatflation."
      2) Water bills: In dry years like this one, utilities have to withdraw less water from dwindling reservoirs, which means they have less to sell, and have to raise prices to make up the difference… extreme precipitation events caused unprecedented damage to utility infrastructure and forced costly repairs – a burden most often passed down to ratepayers… excessive heat is increasingly causing fertilizer-laden water bodies to form harmful algae blooms…a cost incorporated into consumers' water bills.
      3) Insurance premiums: We rely on home insurance to help us recover after a disaster, but policies are getting more expensive and harder to obtain as floods, fires, and hurricanes intensify… The hikes have been so severe that hundreds of thousands of homeowners have dropped their [National Flood Insurance Program] *policies altogether. As insurers disappear, coverage gets more expensive… homeowners… must either pay skyrocketing prices or drop their policies and live without a safety net.*
      4) Utility bills: Climate change is impacting the frequency and severity of heat and cold spells in different parts of the United States – and in 2022, these periods of extremes made it harder for people to afford their home heating and cooling costs… Low-income families of color, both in urban and rural settings, are being hit the hardest. Black, Latino, and Indigenous households are more likely than white households to have their power cut off due to unpaid utility bills."
        - Source: Bittle, J., Yoder, K., Lee, J., Marsh, B., & Pontecorvo, E. (2022, December 21). 5 ways climate change made life more expensive in 2022. *Grist*. https://grist.org/economics/5-ways-climate-change-made-life-more-expensive-in-2022

- Although increasing weather disasters are widely visible, well-reported, and expensive, it's not the most horrific impact.

- *"By the end of this year… climate change will have killed roughly 4 million people globally since the turn of the century… **And 4 million lives lost due to climate change, a breathtakingly high number, is still an underestimate — probably a big one**. The McMichael standard doesn't include deaths linked to climate-driven surges of the many non-malarial diseases spread by mosquitoes, like dengue and West Nile virus. It doesn't incorporate deaths caused by deadly bacteria, fungal spores, ticks, and other diseases or carriers of disease that are shifting in range and breadth as the planet warms. It doesn't examine the impacts of wildfires and wildfire smoke on longevity. It doesn't look at the mental health consequences of extreme heat and extreme weather and the related increase in suicides that have been documented in recent years… 'Climate change is killing a lot of people, nobody is counting it, and nobody is moving in the direction of counting it,' Carlson said. 'If it were anything but climate change, we would be treating it on very different terms.'"*
    - Source: Teirstein, Z. (2024, January 30). *Climate change has killed 4 million people since 2000 — and that's an underestimate*. Grist. https://grist.org/health/climate-change-has-killed-4-million-people-since-2000-and-thats-an-underestimate/

- How is a number that high possible? Climate disasters have cascading effects:



    - Source: Chester, A., & Lawton, J. (2022). Atlas of disaster. In *Rebuild by Design*. Rebuild by Design. https://rebuildbydesign.org/wp-content/uploads/2023/04/ATLAS-OF-DISASTER-compressed.pdf

- The higher global temperature of climate change affects all aspects of life:
    - Weather: more dangerous summer heat waves, longer lasting droughts, more intense wildfires, and stronger storms.

    - Environment: melting sea ice, sea level rise, flooding, warmer oceans and marine heat waves, and ecosystem stressors.
    - Agriculture: less predictable growing seasons, reduced soil health, and food shortages.
    - Animals: rapidly alters or destroys wildlife habitats, and disrupts key survival behaviors like mating, feeding, migration.
    - People: health - worsening air quality, increase in insect-borne diseases, surviving extreme weather events, worsening mental health; worsening inequality; increasing displacement; and economic costs.
        - Source: Lindwall, C. (2022, October 24). *What are the effects of climate change?* Natural Resources Defense Council. https://www.nrdc.org/stories/what-are-effects-climate-change

- There are two concurrent approaches to tackling climate change: Mitigation and Adaptation.
    - Mitigation is about reducing the far future impact. It's *"reducing the flow of greenhouse gasses into the atmosphere by replacing fossil fuels with renewable energy."*
    - Adaptation is about now and soon-to-be future. It's "*building resilience to weather shocks — for example, by constructing a seawall or planting crops that can withstand droughts and floods."*
        - Source: Samuel, S. (2023, February 3). Anticipatory cash transfers are a neglected climate change solution. *Vox*. https://www.vox.com/future-perfect/23574798/climate-adaptation-anticipatory-cash-transfers-givedirectly

When the Air is Poison

What Pollutes Our Air?

- *"Air pollution is contamination of the indoor or outdoor environment by any chemical, physical or biological agent that modifies the natural characteristics of the atmosphere. Household combustion devices, motor vehicles, industrial facilities and forest fires are common sources of air pollution. Outdoor and indoor air pollution cause respiratory and other diseases and is an important source of morbidity and mortality. Air pollution kills an estimated seven million people worldwide every year."*
    - Source: World Health Organization: WHO. (2019, July 30). *Air pollution*. https://www.who.int/health-topics/air-pollution#tab=tab_1

- Lead: *"Major sources of lead in the air are ore and metals processing and piston-engine aircraft operating on leaded aviation fuel. Other sources are waste incinerators, utilities, and lead-acid battery manufacturers. The highest air concentrations of lead are usually found near lead smelters.*
  Once taken into the body, lead distributes throughout the body in the blood and is accumulated in the bones. Depending on the level of exposure, lead can adversely affect the nervous system, kidney function, immune system, reproductive and developmental systems and the

cardiovascular system. Infants and young children are especially sensitive to lead exposures, which may contribute to behavioral problems, learning deficits and lowered IQ.
Lead is persistent in the environment and can be added to soils and sediments through deposition from sources of lead air pollution. Other sources of lead to ecosystems include direct discharge of waste streams to water bodies and mining. Elevated lead in the environment can result in decreased growth and reproduction in plants and animals, and neurological effects in vertebrates."

- Source: Environmental Protection Agency. (2022b, July 26). *Basic information about lead air pollution*. US EPA. https://www.epa.gov/lead-air-pollution/basic-information-about-lead-air-pollution

- Sulfur Dioxide: *"The largest source of SO2 in the atmosphere is the burning of fossil fuels by power plants and other industrial facilities. Smaller sources of SO2 emissions include: industrial processes such as extracting metal from ore; natural sources such as volcanoes; and locomotives, ships and other vehicles and heavy equipment that burn fuel with a high sulfur content.*
  Short-term exposures to SO2 can harm the human respiratory system and make breathing difficult. People with asthma, particularly children, are sensitive to these effects of SO2. Small particles may penetrate deeply into the lungs and in sufficient quantity can contribute to health problems. At high concentrations, gaseous SOx can harm trees and plants by damaging foliage and decreasing growth. SO2 and other sulfur oxides can contribute to acid rain which can harm sensitive ecosystems."
  - Source: Environmental Protection Agency. (2023b, February 16). *Sulfur dioxide basics.* US EPA. https://www.epa.gov/so2-pollution/sulfur-dioxide-basics

- Nitrogen Dioxide: *"NO2 primarily gets in the air from the burning of fuel. NO2 forms from emissions from cars, trucks and buses, power plants, and off-road equipment.*
  Breathing air with a high concentration of NO2 can irritate airways in the human respiratory system. Such exposures over short periods can aggravate respiratory diseases, particularly asthma, leading to respiratory symptoms (such as coughing, wheezing or difficulty breathing), hospital admissions and visits to emergency rooms. Longer exposures to elevated concentrations of NO2 may contribute to the development of asthma and potentially increase susceptibility to respiratory infections. People with asthma, as well as children and the elderly are generally at greater risk for the health effects of NO2. NO2 along with other NOx reacts with other chemicals in the air to form both particulate matter and ozone. Both of these are also harmful when inhaled due to effects on the respiratory system.
  NO2 and other NOx interact with water, oxygen and other chemicals in the atmosphere to form acid rain. Acid rain harms sensitive ecosystems such as lakes and forests. NOx in the atmosphere contributes to nutrient pollution in coastal waters."
  - Source: Environmental Protection Agency. (2022c, August 2). *Basic information about NO2*. US EPA. https://www.epa.gov/no2-pollution/basic-information-about-no2

- Fine Particulate Matter: *"Fine particulate matter (PM2.5) are tiny airborne solid and liquid particles less than 2.5 microns in diameter. PM2.5 in NYC comes from inside and outside the*

city from all kinds of combustion activity, including the burning of fuel in vehicles, buildings, power plants, and construction equipment, as well as commercial cooking and industrial activities. PM2.5 can either come directly from these sources or be formed in the atmosphere from other pollutants. PM2.5 is the most harmful urban air pollutant, small enough to penetrate deep into the lungs and enter the bloodstream, resulting in adverse respiratory and cardiovascular health outcomes and contributing to an increased risk of death and lower life expectancy. Major sources of PM2.5 in NYC include: commercial cooking (38%); buildings (22%); non-road (21%); and traffic (14%). PM2.5 and related health problems from traffic are highest in the poorest neighborhoods. PM2.5 levels from all traffic sources are 50% higher in high poverty neighborhoods relative to low poverty neighborhoods."

- Source: NYC Department of Health and Mental Hygiene. (n.d.-b). *The public health impacts of PM2.5 from traffic air pollution*. Environment and Health Data Portal. https://a816-dohbesp.nyc.gov/IndicatorPublic/data-stories/traffic-and-air-pollution/

In Our Backyard

Asthma Alley - South Bronx

- *"*[W]*e're walking the streets of the South Bronx. We're carrying a backpack with instruments that take measurements of air pollution as we walk… New York and other cities have experienced some really poor air quality this summer, partially because of wildfires burning in the U.S. and Canada. By combining the airborne measurements with what we see at street level, we'll get a much better picture of air quality throughout the city… We walked through neighborhoods in Manhattan, the Bronx, Brooklyn, and Queens this summer, collecting measurements of particulate matter and ozone. These are two air pollutants that are regulated and detrimental to health.*
  [W]*e also want to answer some environmental justice questions. We know air quality varies between different New York City neighborhoods… This area in the South Bronx has some of the worst air pollution in New York City, and even has been nicknamed 'Asthma Alley.'… bring attention to the fact that even though we all live in one city, everybody has very different experiences of the city and very different health outcomes from these different experiences…"*
  - Source: CIRESvideos. (2023, October 13). *CIRES researchers tackle air quality from New York streets* [Video]. YouTube. https://www.youtube.com/watch?v=2-XADw9p_H8

- *"Bronx residents require hospitalization for asthma at five times the national average and at rates 21 times higher than other New York City neighborhoods… Every weekday, 15,000 trucks pass through the Hunts Point neighborhood of the Bronx, producing toxic air pollution on their way to and from the Hunts Point Market, one of the world's largest food distribution centers. These diesel emissions directly affect the residents of the community. In addition, Greenwald said, facilities in the South Bronx also handle 100 percent of the waste produced in the Bronx and at least 23 percent of the city's commercial waste."*
  - Source: Ruiz, A. (2021, September 8). What does sustainability mean in the Bronx? *Vox*. https://www.vox.com/the-goods/22654323/sustainability-bronx-environmental-racism-zero-waste

- *"A young Latina girl living in New York's South Bronx finds hope in music when poor air quality and worsening pollen seasons make it hard for her to breathe. With asthma rates 8 times the national average and asthma deaths 4 times the state average, her neighborhood is known as Asthma Alley."*
    - Source: GroundTruth Project. (2020, April 1). *Asthma alley - short film* [Video]. YouTube. https://www.youtube.com/watch?v=2uC9H_mT2VU

- *"An excessive amount of trash trucks rumble through residential neighborhoods in the South Bronx causing asthma rates to spike."*
    - Source: Alexandria Bordas [alexandria bordas]. (2016, November 29). *Environmental racism - the South Bronx* [Video]. YouTube. https://www.youtube.com/watch?v=6rVZ-uZZP1w

Burden of Online Shopping - South Bronx, Red Hook, and Long Island City

- *"Scientists from Columbia University studied the impact of the new FreshDirect warehouse on traffic, air pollution, and noise in Mott Haven and found that truck and car traffic increased significantly — between 10% and 40%, depending on the time of day... Mott Haven is 67% Hispanic and 28% Black and has a poverty rate more than twice the NYC average.*
  Before FreshDirect moved in, the neighborhood was already dealing with several other sources of air pollution: two highways, two waste transfer stations, and a food distribution center hub in nearby Hunts Point. Markus Hilpert, PhD, an associate professor of environmental health sciences at Columbia University and senior author of the paper, said that even slight increases in air pollution "are a concern" in Mott Haven because of its existing issues with air quality. Air pollution levels have dropped in most neighborhoods in New York City, but not in Mott Haven."
    - Source: Costley, D. (2020, May 14). What happens when a FreshDirect warehouse moves into your neighborhood. *Medium*. https://onezero.medium.com/what-happens-when-a-freshdirect-warehouse-moves-into-your-neighborhood-db6406b3595e

- *"About 3 million New Yorkers live within a half-mile of large warehouses, which fill online orders but also create delivery truck traffic that dangerously pollutes the air. And those residents are more likely to be Black, Hispanic or live in poverty… pollution from e-commerce disproportionately affects people who are already at risk for severe asthma, heart disease, preterm birth and other health effects of bad air. Children, older adults, pregnant New Yorkers and those with chronic health conditions are all especially vulnerable to air pollution, according to the Environmental Protection Agency. "Because of the density in New York City, you're seeing communities where every child lives within a half-mile of a warehouse," said Aileen Nowlan, policy director for EDF and a coauthor on the report…*
  Dozens or even hundreds of truck trips serve each warehouse daily. And along the way, diesel-burning trucks spew dangerous pollutants, including nitrogen oxide and PM2.5 — a term for easily inhaled fine particulate matter — especially when they start, idle or drive slowly, Nowlan said… because of city zoning rules, they can be sited in manufacturing districts without any consideration for their environmental effects…

They found that many of the largest warehouses were clustered in traditionally industrial neighborhoods, including Red Hook, Long Island City and the South Bronx. Those neighborhoods also have long legacies of environmental injustice… air pollution in Red Hook, which is home to multiple Amazon warehouses, regularly exceeds the EPA's safety threshold, Gothamist previously reported. In all three neighborhoods, more than a third of asthma cases can be attributed to nitrogen dioxide, a toxic component of vehicle exhaust… Truck traffic could further compound these health disparities, Garcia said."

- Source: Jeffrey-Wilensky, J. (2024, January 24). 1 in 3 New Yorkers live near mega-warehouses that can cause serious health issues. *Gothamist*. https://gothamist.com/news/1-in-3-new-yorkers-live-near-mega-warehouses-that-can-cause-serious-health-issues

New York City's 'Slow Violence'

- *"Roughly 70% of all Superfund sites are located within a mile of public housing. Black folks are disproportionately impacted, representing 45% of residents living in the more than 9,000 federally subsidized properties in contaminated areas.* [New York City Housing Authority's Cooper Park Houses] *resident Karen Leader believes that allowing toxic industries to operate in low-income Black communities should be treated as a "race massacre," but the federal government has been slow to address the problem… Today, Cooper Park* [r]*esidents are exposed to more diesel pollution than 98% of the American population.*
  During two 10-minute periods on a Wednesday afternoon in November, Capital B counted 52 garbage trucks, 18-wheelers, and scrap metal haulers driving by the housing projects. Even in the cold, Leader explained, "you can feel the exhaust and dust caught in your throat."
  *Roughly 30% of residents in the census tract where the Cooper Park Houses are located report having "poor health," double the ZIP code's average. The city Health Department says residents in the census tract are diagnosed with lung cancer at a rate that is twice what is expected. Because these health ailments likely result from a poisonous brew of factors over many years, elected officials, large companies, and mega-polluters can evade accountability. Meanwhile, the most marginalized residents live through the debilitating fallout of "**slow violence**," a term coined by Princeton University professor Rob Nixon to explain how overlapping social harms gradually kill people.*
  - Source: Mahoney, A. & Capital B. (2023, January 15). Public housing tenants struggle against the 'slow violence' of industrial pollution. *The City*. https://www.thecity.nyc/environment/2023/1/9/23545203/brooklyn-public-housing-cooper-park-industrial-pollution

- *"More than 22.5 million people are breathing bad air across New York City, Newark and its surrounding areas – and just over half are people of color… It is the only urban area in the Northeast to rank on the list of the 25 most ozone-polluted cities. … Particulate matter pollution (PM2.5)…* [is] *emitted from airports, power plants, manufacturing facilities and gas-powered vehicles…*
  These fine particles have been linked to cardiovascular and respiratory diseases, hospital admissions, dementia and aberrant brain development during pregnancy… disparities that fall along racial and socioeconomic lines, as it relates to both ozone and particulate matter…

"We've seen the relationship between redlining and adverse environmental exposure," Casey said. "Where people can afford to live is related to the environmental quality there and the exposures they experience as well as comorbidities that they suffer from."

- Source: Misdary, R. (2022, April 21). American lung association: NYC's air quality is improving, but still gets a failing grade. *Gothamist*. https://gothamist.com/news/american-lung-association-nycs-air-quality-is-improving-but-still-gets-a-failing-grade

- *"Every year in NYC between 2015 and 2017 (the most recent years for which this analysis is available), fine particulate matter pollution from motor vehicles and burning fossil fuels caused: at least 2,000 deaths; about 1,400 hospital admissions for lung and heart conditions; and 3,750 emergency department admissions for asthma…*
  [O]*ur most polluted neighborhoods, in Midtown and Lower Manhattan, are among the wealthiest in the city. But kids and adults living in high-poverty neighborhoods experience more air pollution-related health problems… despite similar improvements in air quality, high poverty neighborhoods would have much greater health benefits… local efforts to improve air pollution – like reducing truck traffic, or providing incentives for buildings to convert to cleaner heating oil – should focus on neighborhoods with the highest poverty, not the ones with the worst air pollution."*
  - Source: NYC Department of Health and Mental Hygiene. (n.d.-a). *Efforts to reduce air pollution should focus on neighborhoods with the worst health impacts*. Environment and Health Data Portal. https://a816-dohbesp.nyc.gov/IndicatorPublic/beta/data-stories/hia

Across the Country

East Palestine, OH and St. Louis, MO / Metro East

- *"The southern Illinois region (known as Metro East) is also home to over 80,000 people who live in one of these small towns along the water. Most of them are Black; a small minority are Latine and white… Home is also where a dirty legacy runs deep: of racism and violence, of exploitation and pollution. Within a 10-mile radius of St. Louis, 92 toxic facilities exist, according to the Environmental Protection Agency's Toxic Release Inventory. On the east side alone, these polluters include a steel plant, an incinerator, several chemical plants, and freight train terminals. "People's houses will be very close to these big industrial facilities," said Grace Iverson, a volunteer with the local grassroots environmental group River City Climate Collective. It's no surprise, then, that this region is also where the train that derailed in East Palestine, Ohio, last month started its journey before overheating, slipping off the tracks, and releasing hazardous chemicals.*
  "Environmental racism has plagued predominantly Black communities for decades," said Jeffrey Dixon, director of Empire 13, a local grassroots group focused on racial, economic, and environmental justice. His community to the east of St. Louis regularly deals with its own explosions and fires. Last year, a recycling warehouse erupted in flames. A month before that, so did a chemical plant. A year prior, another chemical plant billowed black plumes into the sky, a sight not different from what played out in East Palestine, Ohio, last month. "You would see

the smoke in the community," Dixon said. "You'd think it's cloudy, but it's actually the chemicals coming out of those plants."
What made the disaster in Ohio stand out among what is unfortunately common across the U.S. was its magnitude. At least 11 train cars carrying hazardous chemicals derailed during the incident on Feb. 3; five of them were carrying a total of 115,580 gallons of vinyl chloride, according to a preliminary report by the NTSB released last week. To prevent the industrial gas from exploding, authorities conducted a controlled burn of the substance. New estimates suggest the incident killed over 43,000 animals. As for humans, well, exposure to the chemical can lead to cancer… In the wider St. Louis region,... "it feels to these communities that we're disposable, that there's no need to clean up," said Beth Gutzler, the lead environmental justice organizer with Metropolitan Congregations United, a faith-based organization in the community. "If you have enough money, you can just move to another area that doesn't have these problems. There's not a sense of urgency to give equitable environments to everybody throughout the St. Louis region."
Bret Gustafson, an anthropology professor at Washington University in St. Louis [said] *"it's a sacrifice zone … In anthropology, we talk about devaluation and degradation of places and people. For the sake of industry, I think this is one of those regions where that has happened."*
    - Source: Funes, Y. (2023, March 2). The Ohio train derailment: Tracing the origins of disaster. *Atmos*. https://atmos.earth/ohio-train-derailment-st-louis-environmental-racism

Allegheny County, PA and Cook County, IL

- *"Coal plants release heavier particles and localized pollution that can have acute impacts within a 30- to 50-mile radius, but they also release fine particulate matter that gets blown hundreds of miles away downwind from tall smokestacks… The highest number of deaths due to coal plant pollution happened in Allegheny County in Pennsylvania and Cook County in Illinois, with 63 and 61 fatalities per year, respectively. Yet Cook Country is hundreds of miles away from the nearest power plant. The Labadie plant, Cook County's biggest coal pollution contributor, owned by the American energy company Ameren, is over 300 miles away in rural Missouri. For the average coal plant, only 4 percent of premature deaths occurred in the facility's same county and only 18 percent occurred in the same state, highlighting the cross-regional nature of the problem of coal soot."*
    - Source: Begert, B. (2023, February 27). Coal plant pollution can be deadly — Even hundreds of miles downwind. *Grist*. https://grist.org/climate-energy/coal-plant-pollution-can-be-deadly-even-hundreds-of-miles-downwind

Birmingham, AL

- *"No Southern city has experienced a longer and more damaging legacy of environmental injustice than Birmingham. As coke production fueled the city's rise — powering plants that made everything from cast-iron pipes to steel beams — white leaders enacted housing policies that forced Black people to live in the most hazardous communities… Birmingham residents were exposed to so many pollutants — such as cancer-causing polycyclic aromatic hydrocarbons — that breathing the air was equivalent to smoking two and a half packs of*

cigarettes a day. From the early 1960s to the early 1970s, the Birmingham area saw emphysema death rates spike by 200 percent, so bad that one federal official declared Birmingham's air quality to be the worst in the South. For years, Julia Powe said, her mother wanted to move away from the city's north side because of its toxic air. But there was nowhere they could afford to go. "We made do with what we had," Powe said. "We had to go along to get along."

- Source: Blau, M. (2022, September 20). The environmental injustices of coke plants in Birmingham, AL. *ProPublica*. https://www.propublica.org/article/bluestone-jim-justice-north-birmingham

Baytown, TX

- "*Brittany Madison is worried about the air. Madison, who is 31, lives in Baytown, Texas, a city next to the Houston ship channel where the skyline is dense with the glittering towers of chemical plants… Her apartment is within about 30 miles of more than 170 facilities that give off toxic chemical emissions. The EPA collects data on each individual facility, but it doesn't consider the excess cancer risk from all of the facilities' combined emissions. When the emissions from all … the facilities in the area are added together, the estimated additional cancer risk on Madison's block jumps* [from 1 in 730,000] *to 1 in 46,000…"*
  - Source: Younes, L., Kofman, A., Shaw, A., Song, L., & Miller, M. (2021, November 2). Poison in the air. *ProPublica*. https://www.propublica.org/article/toxmap-poison-in-the-air

Actions to Take

- Support **local BIPOC** (Black, Indigenous and People of Color) **led community organizations** by volunteering, donating, and sharing about their work. Get involved with local advocacy groups and question political candidates about their environmental plans.

  - *"**South Bronx Unite** brings together neighborhood residents, community organizations, academic institutions, and allies to improve and protect the social, environmental, and economic future of Mott Haven and Port Morris. We envision a South Bronx where everyone is thriving because we have equitable access to clean air, nutritious food, truly affordable and quality housing, good health care, resources to advance our contributions to arts and culture, community centers, open green spaces, good schools with adequate resources, jobs with livable wages, a transformative justice approach to public safety, and participatory decision-making for public policies and community development."*
    - Source: South Bronx Unite. (n.d.). *Who we are*. https://www.southbronxunite.org/who-we-are

  - *"Founded in 1966, **UPROSE** is Brooklyn's oldest Latino community-based organization. An intergenerational, multi-racial, nationally recognized community organization, UPROSE promotes sustainability and resiliency in Brooklyn's Sunset Park neighborhood through community organizing, education, indigenous and youth leadership development, and cultural/artistic expression… As lead advocates of climate justice,*

UPROSE views the just urban policy—ranging from transportation to open space—as the heart of climate adaptation and community resilience."

- Source: UPROSE. (n.d.). *Mission, Journey and Vision*. https://www.uprose.org/about-us/

- **New York City Environmental Justice Alliance** (NYC-EJA)
  - *"a non-profit, 501(c)(3) citywide membership network linking grassroots organizations from low-income neighborhoods and communities of color in their struggle for environmental justice. NYC-EJA empowers its member organizations to advocate for improved environmental conditions and against inequitable environmental burdens by the coordination of campaigns designed to inform City and State policies. Through our efforts, member organizations coalesce around specific common issues that threaten the ability for low-income communities of color to thrive."*
    - Source: NYC Environmental Justice Alliance. (n.d.). *Our mission*. https://nyc-eja.org/about-us/our-mission

  - *NYC-EJA "used extensive, cutting edge climate and emissions modeling to discover how different policies and implementations would impact air quality and emissions in New York State. We found that the most effective policies at reducing emissions were those recommended by environmental justice communities."*
    - Source: Aguirre, A. (n.d.). *Climate justice & community resiliency*. New York City Environmental Justice Alliance. https://nyc-eja.org/campaigns/climate-justice-community-resiliency/

- **Address Air Quality**—both outdoors and indoors

  - *"Check daily air pollution forecasts in your area at airnow.gov. The color-coded forecasts let you know when the air is unhealthy in your community. When the air is bad, move your exercise plans and other activities indoors."*
    - Source: American Lung Organization. (2023). *State of the air: 2023 report*. https://www.lung.org/research/sota

  - Gas stoves: *"Beyond the trusty microwave, you might have one or more of the following appliances taking up space in your kitchen: toaster oven, air fryer, Instant Pot (or some other multicooker), or an electric kettle or hot water heater. Using them more, particularly for smaller meals, can help reduce the amount of pollutants, such as nitrogen dioxide, released into your home when you turn on your gas burners… If you do need to use your gas stove or oven, it can help to turn on your range hood while cooking… If your hood isn't vented outside or you don't have one, you should open your windows…* [or] *try turning on a bathroom fan. "Even opening a window for five minutes can sometimes be helpful in removing some of the pollutants."... You can also buy a low-cost induction hot plate that plugs into a regular outlet. Models are available with single or double burners."*
    - Source: Chiu, A. (2023a, February 7). Worried about having a gas stove? Here's how to limit risks. *Washington Post*.

https://www.washingtonpost.com/climate-solutions/2023/02/04/how-to-use-gas-stove-safely

- Think about **transportation**.
    - *"Choose a cleaner commute — carpool, use public transportation, bike or walk when possible. Combine errands to reduce "cold starts" of your car and avoid extended idling. Be sure your tires are properly inflated."*
        - Source: AirNow. (n.d.). *What you can do*. https://www.airnow.gov/education/what-you-can-do
    - Reduce, or at least consolidate, e-commerce purchases to help keep polluting delivery trucks off the road.
- **Reduce energy consumption** and **reliance on fossil fuels**.
    - *"Conserve electricity and purchase your power from clean, non-combustion sources if you can. Don't burn leaves or trash and avoid burning wood whenever possible."*
        - Source: American Lung Organization. (2023). State of the air: 2023 report. https://www.lung.org/research/sota
    - "*Get a Heat Pump: They're the warmer, cooler, easier way to heat and cool your home, and they don't burn fossil fuels like oil, propane, or natural gas.*"
        - Source: NYC Mayor's Office of Climate and Economic Justice. (2023, August 18). *Take action*. NYC Mayor's Office of Climate and Environmental Justice. https://climate.cityofnewyork.us/take-action/
    - Look for local and national programs to help:
        - NYC: Tax incentive for installing a Green Roof or Solar Panels
            - Source: NYC Department of Buildings. (n.d.). *Green roofs & solar panels - buildings*. https://www1.nyc.gov/site/buildings/property-or-business-owner/green-roofs-solar-panels.page
        - NYC: *"Community Solar (CS) is a win-win opportunity to expand access to solar electricity to all New Yorkers. The Gateway enables community solar by connecting interested subscribers with viable projects built by trusted developers. Anyone can participate in CS in NYC."*
            - Source: *Shared Solar NYC*. (n.d.). Sustainable CUNY. https://sharedsolarnyc.org/
        - NYC: No- or low-cost CoolRoofs (painting roofs white to reflect the sun/heat)
            - Source: NYC Department of Small Business Services. (n.d.). *NYC CoolRoofs - NYC business*. https://www1.nyc.gov/nycbusiness/article/nyc-coolroofs
        - NYC: Resources (including pitch deck) to "*reach out to landlords and building managers, and introduce the idea of putting a green roof on your building.*"

- Source: Yan, V. (2022, June 24). *Painting the skyline green - a call to action*. Brooklyn Grange. https://www.brooklyngrangefarm.com/blog/nyc-green-roof-advocacy

- National: A home energy assessment *"can help you determine how much energy your home uses, where your home is inefficient, and which problem areas and fixes you should prioritize to save energy and improve the comfort of your home."*
  - Source: US Department of Energy. (n.d.). *Home energy assessments*. Energy.gov. https://www.energy.gov/energysaver/home-energy-assessments

- National: "*Electrify Stoves, Dryers, and Boilers. Through the Inflation Reduction Act (IRA), you can get tax rebates for appliances that reduce utility bills and slash emissions. If you're a renter, try an electric hotplate or induction stovetop.*"
  - Sources: *Household electrification savings calculator*. (2023, March 7). Rewiring America. Retrieved February 1, 2024, from https://www.rewiringamerica.org/app/ira-calculator and NYC Mayor's Office of Climate and Economic Justice. (2023, August 18). *Take action*. NYC Mayor's Office of Climate and Environmental Justice. https://climate.cityofnewyork.us/take-action/

- NYC Building Owners: Green building upgrades with no upfront capital, no money down, and no property liens.
  - Source: BlocPower. (n.d.). *BlocPower leases: Explained*. https://staging.blocpower.io/lease

- NYC: *"**Radiator Labs** is tackling a persistent and wasteful problem for New York City's older buildings: regulating steam powered radiators that lack temperature controls… With a standard radiator, you can't control room temperature, and the only way to attempt to do so is to open a window and let hot air out and cold air in; a super wasteful way to regulate temperature… Our primary focus… is bringing our efficiency and comfort-improving technology to affordable housing in underserved communities. There are many stakeholders that benefit from our retrofits. The users of radiator-heated buildings enjoy the benefits of temperature control for the first time and the system also saves a tremendous amount of energy for the group operating the building."*
  - Source: Downtown Brooklyn. (2023, March 15). *Make it in Brooklyn: Radiator labs*. https://www.downtownbrooklyn.com/news/2023/make-it-in-brooklyn-radiator-labs

- National: *"**BlocPower**, a climate technology startup based in the Brooklyn Navy Yard, was founded in 2014 with a mission to make American cities greener and healthier. To date, the company has retrofitted more than 1,000 buildings in financially disadvantaged communities throughout New York City, and has projects underway in 24 cities.*
  I knew that millions of Americans in neighborhoods like Bed-Stuy, East New York, and Brownsville wanted change, and to me that included solar panels and all the job creation that comes with them. It became clear that if we wanted communities like these to have solar panels just like everyone else, we were going to have to start a company by ourselves. I started BlocPower when I was still in business

school and Keith joined in 2015. In the summer of 2016, Keith put together one of the largest solar projects in New York State, "Solarize Brownsville," and installed solar panels on 200 homes in one of the lowest income neighborhoods in NYC – something we were told couldn't be done." - Donnel Baird, co-founder and CEO, BlocPower

- Source: Downtown Brooklyn. (2021, March 31). *Brooklyn's leaders in clean energy: Donnel Baird and Keith Kinch of...* https://www.downtownbrooklyn.com/news/2021/brooklyns-leaders-in-clean-energy-donnel-baird-and-keith-kinch-of-blocpower

- **Combat other sources of air pollution**.

  - NYC: Request a free tree - *"If you are a property owner, you can have a tree planted on your street for free. Requests can be made for existing empty tree beds as well as paved sidewalk locations."*
    - Source: NYC Department of Parks & Recreation. (n.d.). *Request a street tree*. https://www.nycgovparks.org/trees/street-tree-planting/request

  - NYC: 311 Report an idling vehicle - "*You can report a vehicle, other than an authorized emergency vehicle, that is parked with its engine running for more than three minutes, or parked next to a school with its engine running more than one minute.*"
    - Source: NYC311. (n.d.). *Idling vehicle*. https://portal.311.nyc.gov/article/?kanumber=KA-02222

    - But, be aware and discrete when reporting. People have been harassed and assaulted.
      - Source: DiLella, C., & Day, A. (2022, March 31). Make $87.50 in 3 minutes: Reporting idling trucks in NYC has become a lucrative side hustle for clean-air vigilantes. *CNBC*. https://www.cnbc.com/2022/03/31/make-87point50-in-3-minutes-by-reporting-idling-trucks-in-new-york-city.html

When the Water is Toxic

What Pollutes Our Water?

- *"Water pollution occurs when harmful substances—often chemicals or microorganisms—contaminate a stream, river, lake, ocean, aquifer, or other body of water, degrading water quality and rendering it toxic to humans or the environment…*
  Water is uniquely vulnerable to pollution. Known as a "universal solvent," water is able to dissolve more substances than any other liquid on earth…
  Around the world, agriculture is the leading cause of water degradation. Every time it rains, fertilizers, pesticides, and animal waste from farms and livestock operations wash nutrients and pathogens—such bacteria and viruses—into our waterways. Nutrient pollution, caused by excess nitrogen and phosphorus in water or air, is the number-one threat to water quality worldwide and can cause algal blooms, a toxic soup of blue-green algae that can be harmful to people and wildlife. Rainfall carries road salts, oil, grease, chemicals, and debris from

impermeable surfaces into our waterways. More than 80 percent of the world's wastewater flows back into the environment without being treated or reused...
Consumers account for the vast majority of oil pollution in our seas, including oil and gasoline that drips from millions of cars and trucks every day. At sea, tanker spills account for about 10 percent of the oil in waters around the world, while regular operations of the shipping industry—through both legal and illegal discharges—contribute about one-third. Oil is also naturally released from under the ocean floor through fractures known as seeps. Accidentally released or improperly disposed of [radioactive waste] *contaminants threaten groundwater, surface water, and marine resources. Our seas are also sometimes spoiled by oil spills and leaks—big and small—and are consistently soaking up carbon pollution from the air."*
    - Source: Denchak, M. (2023, January 11). *Water pollution: Everything you need to know*. NRDC. https://www.nrdc.org/stories/water-pollution-everything-you-need-know

- Harmful algal blooms (HAB)
    - "*HABs occur when algae — simple photosynthetic organisms that live in the sea and freshwater — grow out of control while producing toxic or harmful effects on people, fish, shellfish, marine mammals, and birds.*"
        - Source: National Oceanic and Atmospheric Administration. (2019, April 10). *Harmful algal blooms (red tide)*. https://oceanservice.noaa.gov/hazards/hab

    - *"Human activities that contribute to HABs: runoff from agriculture, dissolved chemicals introduced into water supplies via rainfall or irrigation, and effluent from sewage treatment plants all contribute to excess amounts of nutrients in our waterways. These nutrients are food for algae."*
        - Source: National Oceanic and Atmospheric Administration. (2021, February 26). *Can we clean up, stop, or end harmful algal blooms?* National Ocean Service. https://oceanservice.noaa.gov/facts/hab-solutions.html

    - "*HAB events have been associated with massive wildlife mortalities…and have also been tied to the death of pets and livestock that may be exposed through drinking contaminated water or licking themselves after bodily exposure."*
        - Source: US National Office for Harmful Algal Blooms. (2019). *Wildlife – harmful algal blooms*. https://hab.whoi.edu/impacts/impacts-wildlife

- Marine debris
    - *"Any persistent solid material that is manufactured or processed and directly or indirectly, intentionally or unintentionally, disposed of or abandoned into the marine environment… There is no part of the world left untouched by debris and its impacts."*
        - Source: National Oceanic and Atmospheric Administration. (2018, January 19). *Marine debris*. https://oceanservice.noaa.gov/hazards/marinedebris/

    - *"Marine debris comes in many forms, ranging from small plastic cigarette butts to 4,000-pound derelict fishing nets. Plastic bags, glass, metal, foamed plastic, tires, derelict fishing gear, and abandoned vessels are all examples of debris that often ends*

up in our waterways. Marine debris may be mistaken by some animals for food or eaten accidentally. Often, larger items like nets, fishing line, and abandoned crab pots snare or trap animals. Entanglement can lead to injury, illness, suffocation, starvation, and even death…Microplastics can come from a variety of sources including larger plastic pieces that have broken apart, resin pellets used for plastic manufacturing, or in the form of microbeads, which are small, manufactured plastic beads used in health and beauty products."

- Source: National Oceanic and Atmospheric Administration. (2017, October 10). *Ten things you should know about marine debris*. https://oceanservice.noaa.gov/news/marinedebris/ten-things.html

- Impact on human health
  - *"Water pollution kills. Contaminated water can also make you ill. And low-income communities are disproportionately at risk because their homes are often closest to the most polluting industries. Waterborne pathogens, in the form of disease-causing bacteria and viruses from human and animal waste, are a major cause of illness from contaminated drinking water. Diseases spread by unsafe water include cholera, giardia, and typhoid.*
    A wide range of chemical pollutants—from heavy metals such as arsenic and mercury to pesticides and nitrate fertilizers—are getting into our water supplies. Once they're ingested, these toxins can cause a host of health issues, from cancer to hormone disruption to altered brain function. Children and pregnant women are particularly at risk. Even swimming can pose a risk, [with] *health issues such as skin rashes, pinkeye, respiratory infections, and hepatitis from sewage-laden coastal waters."*
    - Source: Denchak, M. (2023, January 11). *Water pollution: Everything you need to know*. NRDC. https://www.nrdc.org/stories/water-pollution-everything-you-need-know

In Our Backyard

Combined Water Systems - New York City

- *"The 14 wastewater treatment plants around* [New York City] *process 1.3 billion gallons of raw sewage a day. That's 15,000 gallons per second. Before they were built, and for most of the 20th century, all that sewage was just loaded onto a boat and dumped 12 miles east of the Jersey shore. Later, they decided to dump further out - 106 miles instead. In 1991, somebody thought it was a good idea to load all the sludge onto a train and send it 2,000 miles to Sierra Blanca, a little town in west Texas. New York State sent Texas 250 tons of sludge a day for over 10 years.*
  Combined sewer overflows were the last remaining uncontrolled form of water pollution in cities. There are a few things that a city can do. It can build holding tanks. It can actually enlarge the sewer pipes. But those are really expensive, and the alternative to gray infrastructure for CSOs is green infrastructure… to both absorb and slow down the flow of stormwater... And this isn't

only New York City's problem. 772 of America's cities were built with combined sewage systems."

- Source: Vice. (2012, November 13). *New York's toxic wasteland: America's water crisis (part 1/3)* [Video]. YouTube. https://www.youtube.com/watch?v=VrUVLpFaUoM (video contains mild adult language)

- Unfortunately, not much has improved in 10 years: *"Every year, around 20 billion gallons of untreated raw sewage and polluted runoff bypass the city's sewage treatment plants and get dumped into the water along the shoreline in all five boroughs. Almost every time it rains in New York City, raw sewage, pet waste, trash, and polluted runoff flow into waterways where people swim, fish, row, kayak, and boat. As little as one tenth of an inch of rain can overwhelm the city's sewers and sewage treatment plants. Overflows occur regularly along the shorelines of waterfront parks and other public access points, like Hudson River Park, Inwood Hill Park, Roberto Clemente State Park, Astoria Park, Brooklyn Bridge Park, and Snug Harbor. Not only is this gross but it's also incredibly dangerous, putting those who come into contact with contaminated water at risk of developing intestinal illnesses, rashes, and infections."*
  - Source: Levine, L. (2020, February 24). *NYC's new plan would let massive sewage overflows continue*. Natural Resources Defense Council. https://www.nrdc.org/experts/larry-levine/nycs-new-plan-would-let-massive-sewage-overflows-continue

- *"*[T]*he largest combined sewer overflows are located in communities of color… Separating combined sewers is in process in Gowanus, College Point and Canarsie, according to Ted Timbers, a spokesperson for the Department of Environmental Protection. Meanwhile, the city is investing nearly $2 billion through 2025 upgrading drainage systems in flood-plagued Southeast Queens to increase capacity and prevent inundation, as well as making headway in Staten Island, he added. But the city has no comprehensive initiative in place or planned to expand drain capacity throughout the city to prevent flooding...*
  A cheaper — and quicker — way to manage stormwater is through green infrastructure projects, which absorb and redirect water. These interventions include rain gardens, rain barrels, permeable playgrounds and green roofs — generally, practices that decrease impervious surfaces or divert stormwater from even entering the drainage system. Those measures can minimize, but not fully eliminate, the effects of extreme weather, experts say.
  "Water is our wildfires," Rob Freudenberg, vice president of the energy and environment program at the Regional Plan Association, said."
  - Source: Maldonado, S. (2021, September 8). Ida-Deluged NYC drainage system all but forgotten in climate battle. *The City*. https://www.thecity.nyc/2021/9/3/22656414/ida-deluged-nyc-drainage-system-neglected-climate

- *"Oysters used to thrive in the New York harbor and were plentiful… But over time, the reefs became too toxic to serve as a source of food. The oyster population dropped with declining water quality — thanks in large part to industrial pollution, dredging and the combined sewer overflow system that pours raw sewage in the water when it rains— as well as overharvesting…*

The bivalves clean the water by eating microscopic, organic material like phytoplankton and zooplankton, and filtering contaminants from the raw sewage dumped into the water when the sewers — which handle both stormwater and wastewater — overflow during rainstorms. Each oyster can filter up to 50 gallons of water a day — meaning a billion could filter the entire harbor in three days…Oysters are just so much more than for your consumption. They clean the water, they provide habitat for other marine species, they are lessening that wave energy so that hopefully the storm that's coming isn't going to flood your basement,' said Jennifer Zhu, the Billion Oyster Project's marine habitat resource specialist. "The way they can still live with trash and sewage and the dredging — it's amazing. They are the most resilient New Yorkers that are out there."

- Source: Maldonado, S. (2022, December 2). "The most resilient New Yorkers": Oysters get second life in harbor. *The City*. https://projects.thecity.nyc/oysters-new-york-harbor

'Black Mayonnaise' in Newtown Creek – Queens and Brooklyn

- *"In 1978, a Coast Guard helicopter identified a stream of oil seeping from the coast into Newtown Creek at the end of Meeker Avenue in Brooklyn. Shortly after, a plume of oil weighing 17 to 30 million gallons was discovered beneath 55 acres of Greenpoint. The "spill" was the result of a century of refining and storing heavy oil, and numerous explosions and fires that occurred at the huge Standard Oil facilities located here. After increased community concerns, a series of lawsuits, beginning in 2004, from local residents, Riverkeeper and the New York State Attorney General ultimately led to improved cleanup operations and financial repairs for Greenpoint. As of 2019, an estimated 13 million gallons of underground oil have been extracted through a vast network of monitoring wells, recovery wells and treatment systems, which operate 24 hours a day, 7 days a week…*
  However, the infamous Greenpoint Oil Spill is just one of many underground spills that line Newtown Creek. Other past industrial operations have left a variety of toxins in the soil that have contaminated not only the soil and groundwater, but also the air through a process known as vapor intrusion. The New York State Department of Environmental Conservation is overseeing the investigation and cleanup of these various contaminated sites, which may include sampling to understand the extent of a plume and the potential health risks to anyone living or working above it. And while some specific spills have been completely remediated in recent years, most are still being studied and cleaned up. In addition to various forms of petroleum byproducts, other difficult-to-clean toxins persist in local soil and groundwater. Notable sites include Meeker Avenue Plumes, The Nuhart Plastics Factory, and the National Grid Greenpoint Energy Center. These sites pose a direct threat to the health of our community and our waterway..."
  - Source: Newtown Creek Alliance. (2020, October 21). *Oil spills and upland contamination* [Video]. YouTube. https://www.youtube.com/watch?v=qjuk-6osX7s

- *"Studies estimate that over decades, oil refineries on these shores spilled between 17 and 30 million gallons of product… Our entire family has suffered with an array of autoimmune diseases, brain diseases, respiratory diseases, now heart disease, cancer… the pollution left behind can still be seen every day. So far the state says that more than 13 million gallons of oil have been cleaned up and there is more to go. Just now well out on this boat we spotted an oil sheen on the service and a strong smell of gasoline coming from one of the former refinery*

sites. But now there is a devoted team of watchdogs on these waters, with the federal superfund cleanup set to begin at the end of this decade."

- Source: CBS New York. (2023, September 21). *Looking back 45 years after Greenpoint Oil Spill discovery* [Video]. YouTube. https://www.youtube.com/watch?v=Y8s55Fv4REQ

- *"The Newtown Creek cleanup has been delayed for years, mired in discussions over the "Remedial Investigation/Feasibility Study."... Newtown Creek is a larger waterbody than Gowanus Canal (3.8 miles to 1.8 miles), and its Greenpoint side is home to one of the largest North American oil spills – 50 percent larger than the Exxon Valdez disaster. Other manufacturing operations and ongoing sewage discharges have left thick layers of* ***black mayonnaise*** *and other contaminants… Similarly — and outrageously — New York City has proposed no additional reduction of its raw sewage discharges beyond what it has planned to complete by 2042. That plan would leave over half a billion gallons to be discharged annually, even when cleanup is complete."*
  - Source: Dulong, M. (2021, January 20). *Gowanus canal and Newtown creek: A tale of two superfunds*. Riverkeeper. https://www.riverkeeper.org/blogs/docket/gowanus-canal-newtown-creek-two-superfund

- *"At Newtown Creek and elsewhere around the polluted waters of New York City, people are growing kelp and studying how it could offer local environmental benefits and even help fight climate change… "Can you actually do anything to improve water quality? Or is the scale that you would need to improve water quality even feasible? How much kelp do we need to grow to actually tip the balance in New York Harbor?"* [Michael Doall, the associate director for shellfish restoration at Stony Brook University's School of Marine and Atmospheric Sciences] *said… Kelp could improve water quality and restore marine ecosystems by sucking up carbon, nitrogen and phosphorus from runoff and the raw sewage that flows into the water from the city's sewer system when it rains. The nitrogen and phosphorus can cause "harmful algal blooms" (HABs) and stifle marine life. Kelp can also absorb heavy metals and other toxins in the marine environment."*
  - Source: Maldonado, S. (2023b, March 22). Kelp farming may help NYCs climate and polluted waterways. *The City*. https://www.thecity.nyc/environment/2023/3/22/23651020/kelp-farming-climate-solution-polluted-waterways

Across the Country

East Palestine, OH

- *"Many residents of East Palestine, Ohio, have warily returned to their homes after a Norfolk Southern train derailed and spilled more than 100,000 gallons of dangerous chemicals into the air and water earlier this month… The 4,700 residents of East Palestine say they still smell chemical residue in the air, see an oily sheen in the water, and are suffering from headaches and nausea… More than 40,000 fish died after chemicals spilled into waterways during a train derailment in East Palestine, Ohio, earlier this month… Meanwhile, residues from burning vinyl*

chloride, like dioxin, and other leaked chemicals, like butyl acrylate, can haunt water supplies for years and spread through watersheds and underground aquifers that provide drinking water. "The aquifer may remain contaminated for years, even a decade, despite best clean-up efforts in the short and long term," Abinash Agrawal, a professor of earth and environmental sciences at Wright State University, said in an email. "This may not be a threat to breathable air quality, but definitely toxic in drinking water as it can migrate and move/travel in a groundwater plume of contamination to the pumping wells nearby up to several thousand feet."... Parts of East Palestine and the surrounding region will also have to be decontaminated, cleaned up, and remediated. The water used to extinguish the train fire is now toxic, and 2 million gallons of it are being sent to Texas, where it will be injected underground for disposal… The community may also have to look for a new drinking water source, Agrawal said.

- Source: Irfan, U. (2023b, February 25). East Palestine, Ohio, will have to watch its health for years after the train wreck and chemical spill. *Vox*. https://www.vox.com/science/23612128/ohio-train-derailment-east-palestine-chemical-spill-cleanup-norfolk-southern

Jackson, MS

- *"Generations-old sewers are routinely overwhelmed by bigger storms. Algae blooms and excess sediment may contaminate reservoirs amid high temperatures and prolonged drought. Rising sea levels can stymie septic systems and cause saltwater to leach into wells. When wildfires destroy water mains and spread chemical contamination, it may take months for drinking water to become safe again. But experts say the danger is greatest in places like Jackson — low-income communities of color dealing with fragile and failing water infrastructure. A 2019 study reported in the Annals of the American Association of Geographers found that Black, Latino, Native American and Alaska Native households are disproportionately likely to be "plumbing poor."... When water pressure drops, as it did in Jackson, it also allows contaminants to get into the system, Whelton said. Floodwaters laden with microbes seep through holes in the pipes. Soil toxins and spilled chemicals can find their way into the drinking supply. When a community's water infrastructure is old, corroded or exposed to the elements, it becomes that much easier for contamination to leach in.*
  It's not just flooding that can imperil water infrastructure. When the deadliest fire in California history tore through the town of Paradise in 2018, local drinking water became contaminated with cancer-causing benzene and other hazardous substances. Post-fire rainfall flushed ash and burned debris into local lakes and streams, tainting the community's water sources. Not even home filters were sufficient to remove the pollution, the county health department warned.
  On the other side of the country, in Lowndes County, Ala., activists say climate change has exacerbated long-standing sewage problems, preventing the ground from absorbing septic tank effluent and causing untreated waste to bubble up into people's yards and homes. The Justice Department last year launched an investigation into whether the county discriminated against its mostly Black residents by denying them access to adequate sanitation.
  - Source: Dennis, B., & Kaplan, S. (2022, August 31). Jackson, Miss., shows how extreme weather can trigger a clean-water crisis. *Washington Post*. https://www.washingtonpost.com/climate-environment/2022/08/31/jackson-water-crisis-mississippi-floods/

Actions to Take

- Support **local women- and BIPOC-** (black, Indigenous and people of color) **led community organizations** by volunteering, donating, and sharing about their work. Get involved with local advocacy groups and question political candidates about their environmental plans.

    - *"Local community members from both the Brooklyn and Queens sides are needed to join the **Newtown Creek Community Advisory Group**. The purpose of the group is to advise EPA about the cleanup and give voice to local needs. We must demand that the EPA move swiftly and direct the parties potentially responsible for the cleanup to devise a meaningful remediation plan for the whole creek that will fully protect human health and bring life and recreational opportunities back to the waterway."*
        - Join the Community Advisory Group: https://newtowncreekcag.org/join-the-cag/
        - Source: Dulong, M. (2021, January 20). *Gowanus canal and Newtown creek: A tale of two superfunds*. Riverkeeper. https://www.riverkeeper.org/blogs/docket/gowanus-canal-newtown-creek-two-superfund

    - *"In 1966, the Hudson River was dying from pollution and neglect. Run-down factories choked it with hazardous waste, poisoning fish, threatening drinking water supplies, and ruining world-class havens for boating and swimming. Sadly, America's "First River" had become little more than an industrial sewer. At that time, the Hudson River fishermen decided they had enough. Because their catch reeked from oil spilled daily into the river, they banded together to use a decades-old federal law to stem the tide from ruin to recovery. This was the founding of the Hudson River Fishermen's Association – now **Riverkeeper**. Today, Riverkeeper continues its fight, seeking out polluters and teaming with citizen scientists and activists to reclaim the Hudson River. And, we also work to ensure that over nine million New Yorkers have clean, safe drinking water."*
        - Source: Riverkeeper. (2022, February 7). *Our story - Riverkeeper*. https://www.riverkeeper.org/riverkeeper-mission/our-story

- Reduce

    - Use less water: *"Small household leaks can add up to gallons of water lost every day… In the bathroom—where over half of all water use inside a home takes place: turn off the tap while shaving or brushing teeth; and showers use less water than baths, as long as you keep an eye on how long you've been lathering up… In the kitchen—plug up the sink or use a wash basin if washing dishes by hand; use a dishwasher—and when you do, make sure it's fully loaded; scrape your plate instead of rinsing it before loading it into the dishwasher; keep a pitcher of drinking water in the refrigerator instead of letting the faucet run until the water is cool; thaw in the refrigerator overnight rather than using a running tap of hot water; add food wastes to your compost pile instead of using the garbage disposal…Save Outdoors… of the estimated 29 billion gallons of water used daily by households in the US, nearly 9 billion gallons, or 30 percent, is devoted to*

outdoor water use. In the hot summer months, or in dry climates, a household's outdoor water use can be as high as 70 percent. In the yard—timing is everything! Knowing when and how much to water allows you to keep a healthy landscape. Other outdoor uses—drop that hose and keep it covered: sweep driveways, sidewalks, and steps rather than hosing off; wash the car with water from a bucket, or consider using a commercial car wash that recycles water; and if you have a pool, use a cover to reduce evaporation when the pool is not being used."

- Source: Environmental Protection Agency. (2023c, September 15). *Start saving*. https://www.epa.gov/watersense/start-saving

- *"Doing laundry is a source of another serious environmental problem: microfiber pollution. As your clothes and linens churn in the washing machine and tumble around in the dryer, they often shed tiny fibers — many of which are small bits of plastic from synthetic fabrics such as polyester — that can wind up in waterways and the air…*
  ***Washing* [your clothes] *less often and doing full loads** can help you reduce the amount of microfibers released by your clothes, experts say…*
  *And since microfibers are also released from dryers, try **air drying your clothes more often**. Washing and tumble drying your clothes less frequently can also help them last longer and creates additional environmental benefits, such as reduced energy and water consumption. It can also be helpful to wash your clothes at a lower temperature and for a shorter amount of time because hotter and longer washes can produce more polluting fibers. If you can, use a front-loading machine, which has been found to generate less microfiber release than top-loading appliances."*
  - Source: Chiu, A. (2023b, February 19). Your laundry sheds tiny polluting plastic fibers. Here's what to do. *Washington Post*. https://www.washingtonpost.com/climate-solutions/2023/02/19/laundry-microplastic-microfiber-pollution

- Reuse

  - *"The **Buy Nothing Project** was founded in 2013 with the mission to build community by connecting people through hyperlocal gifting, and reducing our impact on the environment."*
    - Source: Buy Nothing Project. (n.d.). *About us*. http://buynothingproject.org/about

  - *"The **Freecycle Network** is … a grassroots and entirely nonprofit movement of people who are giving (and getting) stuff for free in their own towns and keeping good stuff out of landfills."*
    - Source: Freecycle. (n.d.). *Freecycle: About freecycle*. https://www.freecycle.org/pages/about

- Recycle

- If you need to stop using something and it's unable to be repurposed, recycle it. Aim for this to be the last option on the list, not the first action.
    - *"Plastic… none of it is truly recyclable. Globally, only 9% of plastics are ever recycled, and even that tiny amount still requires some virgin plastic in order to maintain quality. Meanwhile, much of modern life is literally wrapped in plastic, 99% of which is derived from fossil fuels … But here's the big problem… The plastic that your milk jug is made from is different from the plastic in your bottle cap, which is different from the plastic in your coffee cup, which is different from the plastic in your straw. And when you start adding filler materials to give plastics characteristics like color, stiffness and texture, you end up with tens of thousands of different hybrid plastics, which can't be recycled together. That's why recycling has been such an epic failure. It's more expensive to collect, sort, and recycle all those varieties of plastic than it is to just make new plastic… "The plastics industry…* ha[s] *spent millions of dollars deceptively fooling the public into just tossing all your plastics into the recycling bin."*
        - Source: PBS Terra. (2024, February 1). *Recycling is a myth – here's how we fix that* [Video]. YouTube. https://www.youtube.com/watch?v=LZc7LpNGUc0

- *"**Recycle plastic, glass, and paper**. Less trash means less material in the waste stream."*
    - Source: National Oceanic and Atmospheric Administration. (2013, June 1). *What you can do: Pollution tutorial*. https://oceanservice.noaa.gov/education/tutorial_pollution/016youcando.html

- Prevent water contamination and pollution

    - *"**Properly dispose** of chemical cleaners, oils, and non-biodegradable items to keep them from ending up down the drain.*
      ***Maintain your car** so it doesn't leak oil, antifreeze, or coolant.*
      *If you have a **pup**, be sure to **pick up its poop**."*
        - Source: Denchak, M. (2023, January 11). *Water pollution: Everything you need to know*. NRDC. https://www.nrdc.org/stories/water-pollution-everything-you-need-know

    - *"**Plant grass, trees and shrubs in bare areas**. The grass, trees and shrubs will reduce and absorb runoff, and their roots will hold the soil together, reducing erosion.*
      ***Use fertilizers and pesticides sparingly** on lawns and gardens. To reduce the use of pesticides, use beneficial insects such as ladybugs and praying mantises to control unwanted pests in the garden.*
      ***Keep* [trash] *out of storm drains**, where it will clog up the drain or end up in the nearest stream or lake."*

        - Source: National Oceanic and Atmospheric Administration. (2013, June 1). *What you can do: Pollution tutorial*. https://oceanservice.noaa.gov/education/tutorial_pollution/016youcando.html

- Look for **local and national programs** that help **keep reusable or recyclable products out of waterways**

    - NYC: Free Recycling Programs for Buildings

        - **e-cycleNYC** - a free, in-building collection service for old electronics for residential buildings with 10 or more units.
            - Source: The City of New York Department of Sanitation. (n.d.-b). *Electronics*. https://www1.nyc.gov/assets/dsny/site/services/electronics
            - Brochure: https://www1.nyc.gov/assets/dsny/downloads/pdf/promotional-materials/e-cyclenyc-brochure-ec-bro-f.pdf

        - **refashionNYC** - "*a free, in-building collection service for old clothes and other fabric items for NYC residents, businesses, schools and nonprofits.*"
            - Source: The City of New York Department of Sanitation. (n.d.-a). *Donate goods*. https://www1.nyc.gov/assets/dsny/site/services/donate-goods

    - NYC: Recycling Organizations

        - *"**FABSCRAP** endeavors to end commercial textile "waste" and maximize the value of unused fabric. It is a convenient and transparent recycling and reuse service, is an affordable and accessible materials resource, and is educating and empowering a diverse community of changemakers."*
            - Source: *FABSCRAP*. (n.d.). FABSCRAP. https://fabscrap.org/

        - *"**Revivn** is a next generation hardware remanufacturing company. They rebuild & recycle office electronics, and connect companies to communities by repurposing technology for schools and social impact programs."*
            - Source: *Revivn - Brooklyn Navy Yard*. (2024, January 23). Brooklyn Navy Yard. https://www.brooklynnavyyard.org/tenants/revivn/

    - NYC Harbor Protectors. They were environmental stewards that volunteered *"to keep our neighborhoods clean and pollution out of our waterways* [through] *catch basin cleanup… catch basin stenciling… rain garden care…* [and] *shoreline cleanup."*
        - *Source: New York City Department of Environmental Protection. (2021, April 22). On Earth Day the Department of Environmental Protection Launches Harbor Protectors Initiative in Coney Island.* https://www.nyc.gov/site/dep/news/21-010/on-earth-day-department-environmental-protection-launches-harbor-protectors-initiative-in#/0

- NYC: **Circular Economy Manufacturing** - Local, small scale solar powered factory processing post-consumer plastics into flakes that can be remolded into new products. *"Using a portable, renewably powered MicroFactory to locally produce well designed products from sustainable material cycles for the Circular Economy."*
  - Circular Economy Manufacturing. (n.d.). *About*. https://www.circulareconomymfg.com/about

- National: **TerraCycle** - free and paid recycling programs, buy recycled products, reuse through Loop. *"Overconsumption and a throwaway culture have led to a global waste crisis. While even complex trash is technically recyclable, most materials are not profitable to recycle. As a result, waste piles up in landfills and pollutes our planet while virgin materials are extracted from the earth to create new products. At TerraCycle, our mission is Eliminating the Idea of Waste®. Businesses, government entities, and people like you work with us globally to keep trash out of landfills or from incineration."*
  - TerraCycle. (n.d.). *About TerraCycle*. https://www.terracycle.com/en-US/about-terracycle

When the Food is Rotten

How is Food Wasted?

- *"More than three-quarters of surplus food comes from perishables, which include fruits and vegetables, meats, prepared fresh deli items, seafood, milk and dairy, and some grain products such as bread and bakery items. Perishables often get discarded, because they quickly go bad. In contrast, non-perishable foods — pastas, canned goods, and highly processed, shelf-stable products — are generally wasted less, because they don't spoil as easily. Fruits and vegetables constitute more than a third of total food waste. Conversely, seafood and meats are the most expensive food types and the two least wasted."*
  - Source: ReFED. (n.d.). *Food waste challenge*. https://refed.org/food-waste/the-challenge/

- *"In high-income countries, 40 percent of food is wasted because people buy more food than they can consume."*
  - Source: World Food Program USA. (2022, March 9). *Food waste: How the World Food Programme helps recover food loss*. https://www.wfpusa.org/drivers-of-hunger/food-waste

- *"Buying too much food (23.4%) and failing to use trimmings and byproducts (24%) account for nearly half of US food waste."*

  - Source: Roe, B. E. & The Conversation. (2022, December 12). Americans waste close to one-third of all food purchases—the equivalent of 1,250 calories a day. Here's a breakdown of how bad it is. *Fortune*.

https://fortune.com/2022/12/12/how-much-food-do-americans-waste-every-year-one-third

- *"'Save The Food,' a major national public service campaign to combat food waste from its largest source—consumers, who collectively waste more food than grocery stores, restaurants or farms. The initiative hopes to encourage consumers to reduce the amount of food they trash in their homes…*
  In the U.S., 40 percent of all food goes uneaten each year, at a cost of $162 billion annually. Consumers are responsible for 40 percent of this waste—more than any other part of the supply chain. It's a problem that costs the average family of four roughly $1,500 per year."
    - Source: The Ad Council & Natural Resources Defense Council. (2016, April 21). *Life of a strawberry* [Video]. YouTube. https://www.youtube.com/watch?v=CLFOK4U34wI

- *"In many rich countries, this food waste happens in the kitchen — when we prepare foods that go uneaten, or leave food to spoil in fridges and kitchen cabinets. For millions of people in developing countries, this food waste happens at harvest time. Poor storage facilities in farms lead to pest infestations and mold ruining crops. Lack of access to technology and markets means many farmers are forced to watch their crops rot in fields as the labor and financial investment required to harvest them is often unavailable."*
    - Source: World Food Programme. (2020, June 2). *5 facts about food waste and hunger*. https://www.wfp.org/stories/5-facts-about-food-waste-and-hunger

- *"By some estimates... 83% of food waste occurs at consumer-facing businesses (40%) and in homes (43%) according to ReFED (2016). Further, in the aggregate, this waste can create system-wide spillovers through increased prices, decreased availability of food, and increased environmental and resource pressures, all of which creates particularly harsh burdens for lower-income consumers."*
    - Source: Roe, B. E., Bender, K. E., & Qi, D. (2021). The impact of COVID-19 on consumer food waste. *Applied Economic Perspectives and Policy*, *43*(1), 401–411. https://doi.org/10.1002/aepp.13079

Why Do We Waste Food?

- *"A major reason is that food is cheaper in the United States than nearly anywhere else in the world, aided (controversially) by subsidies to corn, wheat, milk, and soybeans. But the great American squandering of produce appears to be a cultural dynamic as well, enabled in large part by a national obsession with the aesthetic quality of food. Fruits and vegetables, in addition to generally being healthful, have a tendency to bruise, brown, wilt, oxidize, ding, or discolor and that is apparently something American shoppers will not abide."*
    - Source: Chandler, A. (2016, July 15). *Why Americans lead the world in food waste*. The Atlantic. https://www.theatlantic.com/business/archive/2016/07/american-food-waste/491513/

- *"'Our food system pushes us to waste,' says Roni Neff, an expert in food system sustainability at the Johns Hopkins Center for a Livable Future. Large portions on store shelves lead us to buy more than we need… "Preventing food waste doesn't rise to the top of most people's list of priorities. While most of us really dislike throwing out food, we forget, we change our plans, we choose not to eat foods we don't want, we take the path of convenience," she says."*
    - Source: Pandey, E. (2022, December 4). *America's staggering food waste problem*. Axios. https://www.axios.com/2022/12/04/america-food-waste-problem-climate-change

- *"More than 90 percent of Americans may be prematurely tossing food because they misinterpret food labels as indicators of food safety… Phrases like 'sell by', 'use by', and 'best before' are poorly regulated, misinterpreted and leading to a false confidence in food safety. 'Sell by' dates are a tool for stock control, suggesting when the grocery store should no longer sell products in order to ensure the products still have shelf life after consumers purchase them. They are not meant to communicate with consumers, nor do they indicate the food is bad on that date. 'Best before' and 'use by' dates are intended for consumers, but they are often just a manufacturer's estimate of a date after which food will no longer be at peak quality; not an accurate date of spoiling or an indication that food is unsafe. Consumers have no way of knowing how these 'sell by' and 'use by' dates have been defined or calculated since state laws vary dramatically and companies set their own methods for determining the dates, none of which helps to improve public health and safety."*
    - Source: Natural Resources Defense Council. (2013, September 18). *New report: Food expiration date confusion causing up to 90% of Americans to waste food*. https://www.nrdc.org/media/2013/130918

Food Waste's Impact on the Environment

- *"Enormous amounts of resources – land, water, energy and labour – are used to produce food. When food is lost or wasted, these resources go to waste as well, impacting the efficiency of food production. The percentage of food lost globally after harvest on farm, transport, storage, wholesale, and processing levels is estimated at 13.2 percent in 2021. The food waste occurring at the retail or consumer level is estimated at 17 percent of all food available to consumers in 2019. The world produces enough food to feed everyone, and yet millions suffer from hunger and malnutrition. Food loss and waste exacerbate this problem by reducing the amount of food available for consumption, contributing to food insecurity. Food items with high nutritional values, like fresh produces or animal products (water- and land-based), are particularly impacted by high rates of loss. Food loss and waste translate into a substantial economic loss. This impacts not only producers but also consumers and nations as a whole, not to mention livelihoods and economic stability. Additionally, food waste in landfills contributes to 8 percent of total agrifood system emissions."*
    - Source: FAO. (2023). *Achieving SDG 2 without breaching the 1.5 °C threshold: A global roadmap, part 1: How agrifood systems transformation through accelerated climate actions will help achieving food security and nutrition, today and tomorrow, in brief*. Food and Agriculture Organization of the United Nations. https://doi.org/10.4060/cc9113en

- *"If wasted food were a country, it would be the third largest producer of carbon dioxide in the world, after the U.S. and China. If we reduce food waste, we could cut global emissions by 8-10 percent."*
    - Source: World Food Program USA. (2022, March 9). *Food waste: How the World Food Programme helps recover food loss*. https://www.wfpusa.org/drivers-of-hunger/food-waste

- *"Production, transportation, and handling of food generate significant Carbon Dioxide (CO2) emissions and when food ends up in landfills, it generates methane, an even more potent greenhouse gas.*
  EPA estimated that each year, U.S. food loss and waste embodies 170 million metric tons of carbon dioxide equivalent…– equal to the annual CO2 emissions of 42 coal-fired power plants. This estimate does not include the significant methane emissions from food waste rotting in landfills."
    - Source: Buzby, J. (2022, January 24). *Food waste and its links to greenhouse gasses and climate change*. US Department of Agriculture. https://www.usda.gov/media/blog/2022/01/24/food-waste-and-its-links-greenhouse-gases-and-climate-change

- *"Evidence from Life cycle assessment (LCA) has shown that for most food products, the bulk of the environmental impacts occur earlier rather than later in the life cycle. By the time food waste is ready to be discarded, most of the environmental impacts have already occurred… While often acknowledged, the simple fact that preventing waste is more environmentally beneficial than managing waste is not always reflected in policies, programming and investments related to food loss and waste."*
    - Source: Heller, M. (2019). *Waste not, want not: Reducing food loss and waste in North America through life cycle-based approaches*. United Nations Environment Programme. https://www.unep.org/resources/report/waste-not-want-not-reducing-food-loss-and-waste-north-america-through-life-cycle

Food Waste's Impact on the Hunger Crisis

- *"Americans waste more per capita than any nation on earth — a staggering 40% of our food ends up rotting in fields and landfills — while at the same time our population is becoming increasingly hungry. In the wake of the pandemic, 35 million Americans are food insecure — about 10% of our population… "*
    - Source: Little, A. & Washington Post. (2023, February 11). *America's food waste problem is a hunger solution in disguise* (A. Khan, Ed.). Center for Health Law and Policy Innovation. https://chlpi.org/news-and-events/news-and-commentary/food-law-and-policy/americas-food-waste-problem-is-a-hunger-solution-in-disguise/

- *"In the United States, more than 72 billion pounds of safe, wholesome food goes uneaten a year. We designate some for animal feed, plow some under or leave it to rot in the fields, and simply throw much of it away. All while 41 million Americans go hungry."*
    - Source: Shea, M. (2018, February 21). *Food waste & hunger: Solutions to the paradox*. The Rockefeller Foundation. https://www.rockefellerfoundation.org/blog/food-waste-hunger-solutions-paradox

- *"The amount of spoiled food going to* [US] *landfills has increased dramatically since the 1960s,"* from 12,200 tons in 1960 to 35,280 tons in 2020.
    - Source: Povich, E. S. (2021, July 8). *Waste not? Some states are sending less food to landfills*. The Pew Charitable Trusts. https://www.pewtrusts.org/en/research-and-analysis/blogs/stateline/2021/07/08/waste-not-some-states-are-sending-less-food-to-landfills

- The *"EPA estimated that in 2018 in the United States, more food reached landfills and combustion facilities than any other single material in our everyday trash, at 24 percent of the amount landfilled and at 22 percent of the amount combusted with energy recovery."*
    - Source: Environmental Protection Agency. (2023, January 27). *Sustainable management of food basics*. US Environmental Protection Agency. https://www.epa.gov/sustainable-management-food/sustainable-management-food-basics

- *"Reversing current food waste and food loss trends would preserve enough food to feed 2 billion people. That's nearly twice the number of undernourished people across the globe."*
    - Source: World Food Program USA. (2022, March 9). *Food waste: How the World Food Programme helps recover food loss*. https://www.wfpusa.org/drivers-of-hunger/food-waste

In Our Backyard

New York City

- *"1.3 million tons of food in New York City get thrown away each year."*
    - Source: Sanitation Foundation. (2021, June 24). *Food waste toolkit*. https://www.sanitationfoundation.org/fwf/food-waste-toolkit

- In New York City, it's estimated that the average household:
    - *"wastes 8.4 pounds of total food per household per week (includes typically edible, questionably edible, and inedible)*
    - *wastes 5.4 pounds of edible food per household per week (includes typically edible and questionably edible)"*
        - Source: Hoover, D., & Moreno, L. (2017). *Estimating quantities and types of food waste at the city level* (R-17-09-B). Natural Resources Defense Council. https://www.nrdc.org/sites/default/files/food-waste-city-level-report.pdf

- *"The New York City Council passed a long-awaited "Zero Waste" legislative package…which will expand the pick-up of food-based waste citywide and require all residential buildings to participate by fall of 2024. Instead of being dumped in a landfill, the bills mandate that organic waste be reused for environmentally friendly purposes. That includes composting… as well as processing waste to generate alternative forms of electricity that emit less greenhouse gasses. The carbon dioxide released from food waste represents 20 percent of New York City's overall greenhouse gas emissions, making it the third largest contributor behind buildings (35 percent) and transportation (21 percent)."*
    - Source: Simões, M. (2023, June 13). *NYC Makes it Mandatory for Residential Buildings to Recycle Food Waste*. City Limits. https://citylimits.org/2023/06/08/nyc-makes-it-mandatory-for-residential-buildings-to-recycle-food-waste/

- *"The city sanitation department's proposal to eliminate funding for community composting means most food waste collected through public programs will become gas or landfill, not compost…* [T]*he Department of Sanitation's own food scrap collection programs — including a curbside pick-up program — work differently. In most of the city, food scraps placed in orange street corner bins and in brown curbside containers are not actually composted. Instead, most of the scraps get turned into a slurry, added to wastewater sludge and digested at the Newtown Creek Wastewater Resource Recovery Facility, a Brooklyn sewage treatment plant. Other food waste gets digested in western Massachusetts to create energy and farm fertilizer. The digestion process generates biogas, which is mostly the potent greenhouse gas methane, and helps power the Newtown Creek treatment plant itself. The biogas is supposed to service nearby homes, but as THE CITY has previously reported, that project experienced epic delays. For almost a decade as the project stalled, excess methane was burned off instead."*
    - Source: Maldonado, S. (2023c, December 11). Less compost, more methane gas and landfill loom in proposed budget cuts. *The City*. https://www.thecity.nyc/2023/11/28/budget-cuts-compost-methane-landfill/

- *"Smart Bins… accept meat, fish, bones, dairy products and even plastic bags… all of the material dropped off in Smart Bins goes to commercial transfer stations and facilities, which can sort the organics from the trash.*
  About two-thirds of organics from Queens, Brooklyn, Manhattan and the Bronx go to [a transfer station in East Williamsburg, Brooklyn]*, where it's sorted. Some might be sent to be composted in New Jersey, and the rest gets 'digested' by bacteria to become biogas.*
  Organic material from Staten Island stays in the borough, becoming compost at the 33-acre Staten Island compost facility. In addition to food waste, the Staten Island facility also handles all of the borough's material from landscapers...
  The digester eggs at the Newtown Creek Wastewater Treatment Plant turn food waste and sewage into methane, which is partly used to help power the facility and partly burned off. Other food waste goes to the Pine Island Farm Digester Facility in western Massachusetts."

- Source: Maldonado, S. (2023a, February 21). A third of New York's organic waste ends up in landfills. Here's a better story for how to dispose of it. *The City*. https://projects.thecity.nyc/compost-staten-island-smart-bin

Actions to Take

- *"There is something that the average person can do to slow down climate change, and it can be accomplished without leaving the house. Don't waste food… Among the most effective climate solutions, non-profit Project Drawdown ranks cutting food waste ahead of moving to electric cars and switching to plant-based diets."*
  - Source: Bloomberg Quicktake. (2021, April 8). *Food waste is a major climate problem* [Video]. YouTube. https://www.youtube.com/watch?v=PwTqA9q2L4Y

- Support **local women- and BIPOC-** (black, Indigenous and people of color) **led community organizations** by volunteering, donating, and sharing about their work. Get involved with local advocacy groups and question political candidates about their environmental plans.

  - NYC: "*Neighbors across New York City rely on City Harvest to help fill their plates with fresh, nutritious food. This year, we will rescue more than 77 million pounds of food and deliver it, free of charge, to hundreds of food pantries and soup kitchens across the five boroughs to help feed New Yorkers experiencing food insecurity… we are feeding our city—one day, one meal, one New Yorker at a time.*"
    - Source: City Harvest. (2023, November 2). *Our story*. https://www.cityharvest.org/our-story/

- Planning

  - *"Figure out how much food is really going to waste in your home and what you can do to waste less."*
    - Source: Environmental Protection Agency. (2016, February). *Get smart: Take the challenge: Keep good food from going to waste*. https://www.epa.gov/sites/default/files/2016-02/documents/get_smart_ftgtw_2_1_2016_pubnumberadded_508.pdf

  - *"**The Guest-imator** - an interactive dinner party calculator that helps you estimate how much food you need to keep your guests happy and healthy.*
    ***Meal Prep Mate** - a digital tool to help you create your shopping list and plan your meals before now and the next grocery run - all without wasting a drop."*
    - Source: Natural Resources Defense Council. (n.d.). *Planning*. Save the Food. https://savethefood.com/planning

  - *"Making a list with weekly meals in mind can save you money and time. If you only buy what you expect to use, you will be more likely to keep it fresh and use it all.*

Keep a running list of meals and their ingredients that your household already enjoys - that way, you can easily choose, shop for, and prepare meals that you are likely to consume.
Look in your refrigerator, freezer, and pantry first to avoid buying food you already have. Make a list each week of what needs to be used up and plan upcoming meals around it.
Plan your meals for the week before you go shopping and buy only the things needed for those meals.
Make your shopping list based on how many meals you'll eat at home. Consider how often you will eat out, if you plan to eat frozen precooked meals, and if you will eat leftovers for any of your meals.
Include quantities on your shopping list noting how many meals you'll make with each item to avoid overbuying. For example: 'salad greens - enough for two lunches.'"

- Source: Environmental Protection Agency. (2022a, April 8). *Preventing wasted food at home*. US EPA. https://www.epa.gov/recycle/preventing-wasted-food-home

- Shopping
  - *"Buying in large quantities (e.g., buy one, get one free deals) only saves money if you use all the food before it spoils.*
    Buying food from bulk bins can save you money and reduce food waste and packaging as you can purchase the amount of food you need as opposed to a predetermined amount. When buying in bulk, remember to store food properly in airtight, labeled containers.
    Purchase imperfect produce or upcycled products. Imperfect produce may have physical imperfections but is just as safe and nutritious and can sometimes be found at discounted prices. Upcycled products are made from ingredients that might have otherwise gone to waste."
    - Source: Environmental Protection Agency. (2022a, April 8). *Preventing wasted food at home*. US EPA. https://www.epa.gov/recycle/preventing-wasted-food-home

  - Make more environmentally sustainable purchases
    - *"A study estimating the environmental impact of 57,000 food products in the UK and Ireland… This is the first time a transparent and reproducible method has been developed to assess the environmental impacts of multi-ingredient products. It provides a first step towards enabling consumers, retailers, and policymakers to make informed decisions on the environmental impacts of food and drink products."*
      - Source: EurekaAlert! (2022, August 8). *Environmental impact of 57,000 multi-ingredient processed foods revealed - Oxford study* [Press release]. https://www.eurekalert.org/news-releases/960911

        - Source: Clark, M., Springmann, M., Rayner, M., Scarborough, P., Hill, J., Tilman, D., Macdiarmid, J. I., Fanzo, J., Bandy, L., & Harrington, R. A. (2022). Estimating the environmental impacts of 57,000 food products. *Proceedings of the National Academy of Sciences*, *119*(33). https://doi.org/10.1073/pnas.2120584119

- Storing
    - *"**Interactive** **[Food]** **Storage Guide** - Learn how to store it best, how long it should stay there, and even what to do if it's a little past prime."*
        - Source: Natural Resources Defense Council. (n.d.). *Planning*. Save the Food. https://savethefood.com/planning
    - *"Properly store fruits and vegetables for maximum freshness; they'll taste better and last longer, helping you to eat more of them before they go bad.*
      Make sure you are properly storing food in your refrigerator (e.g., the door is the warmest part, the lower shelves are the coldest).
      Store grains in airtight containers and label the container with the contents and the date.
      Befriend your freezer and visit it often. Freeze food such as bread, sliced fruit, meat, or leftovers that you know won't be eaten in time. Label with the contents and the date."
        - Source: Environmental Protection Agency. (2022a, April 8). *Preventing wasted food at home*. US EPA. https://www.epa.gov/recycle/preventing-wasted-food-home
    - *"Use your freezer. While there are plenty of benefits to eating fresh food, frozen foods can be just as nutritious. They also stay edible for much longer… Cooking and freezing food—especially produce—before it goes bad is a great way to avoid having to toss it."*
        - Source: World Wildlife Fund. (n.d.). *Fight climate change by preventing food waste*. https://www.worldwildlife.org/stories/fight-climate-change-by-preventing-food-waste
    - *"Don't leave perishable food at room temperature for more than two hours.*
      Refrigerate or freeze any leftovers in small, clear, labeled containers with a date."
        - Source: Environmental Protection Agency. (2022a, April 8). *Preventing wasted food at home*. US EPA. https://www.epa.gov/recycle/preventing-wasted-food-home

- Cooking and Preparation
    - *"Experimental Mindset. Adopting a more flexitarian, plant-rich diet is a serious behavior shift, and not an easy one. What if we reframed "never eating steak again" as "experimenting with eating mostly plants"? … The design challenge is crafting plant-based options that are so satisfying and enticing that you don't miss the meat. Like*

Hahnemann, we can experiment our way there. Start slowly by removing meat from traditional recipes. My meat-free pozole soup was an experiment, and though it lacked the oily richness of the pork version, it was a satisfyingly rich broth with hearty beans—another edible prototype.

- Source: Barad, V. (2022, December 13). *5 ways to address climate change from your own kitchen*. IDEO. https://www.ideo.com/blog/5-ways-to-address-climate-change-from-your-own-kitchen

- *"Produce that is past its prime, as well as odds and ends of ingredients and leftovers, may still be fine for cooking. Repurpose these ingredients in soups, casseroles, stir fries, frittatas, sauces, baked goods, pancakes, or smoothies.*
  If safe and healthy, use the edible parts of food that you normally do not eat. For example, stale bread can be used to make croutons, beet greens can be sautéed for a delicious side dish, and vegetable scraps can be used for soup stock.
  Learn the difference between "sell-by," "use-by," "best-by," and expiration dates.
  Aim to cook and serve the right portions for the number of people you are feeding.
  Freeze, pickle, dehydrate, can, or make jam/jelly from surplus fruits and vegetables - especially abundant seasonal produce.."
  - Source: Environmental Protection Agency. (2022a, April 8). *Preventing wasted food at home*. US EPA. https://www.epa.gov/recycle/preventing-wasted-food-home

- *"Be creative with leftovers. Websites like Big Oven, Supercook, and MyFridgeFood allow you to search for recipes based on ingredients already in your kitchen. You can also use apps like Epicurious and Allrecipes to make the most of what's in your fridge and pantry."*
  - Source: World Wildlife Fund. (n.d.). *Fight climate change by preventing food waste*. https://www.worldwildlife.org/stories/fight-climate-change-by-preventing-food-waste

- **Buy local and in-season** whenever possible: Community Supported Agriculture (CSA) shares and farmer's markets.

  - "*Eating locally grown, in-season fruits and vegetables cuts down on the energy used to grow and transport food, meaning fewer emissions from massive, refrigerated trucks, and less demand for the heat and light required to keep a northern greenhouse toasty and productive year-round."*
    - Source: The Climate Reality Project. (2021b, April 21). *5 climate action chores for kids*. Climate Reality. https://www.climaterealityproject.org/blog/5-climate-action-chores-kids

  - New York: *"Rock Steady Farm is a queer owned and operated cooperative vegetable farm rooted in social justice, food access and farmer training… Our vegetables feed a*

450-member sliding scale CSA, which includes no-cost and subsidized shares made possible through our Food Access Fund… Our newest focus area is our public programs, geared to train and support other LGBTQIA+ farmers, educate the broader community and fuel movements for systemic change.

- Source: Rock Steady Farm. (n.d.). *Our mission*. https://www.rocksteadyfarm.com/about

- Involve friends and family, even kids, in **understanding what it takes to grow food**.

  - Get involved in your local community garden. NYC: *"Gardening experts say, the initial steps for joining a local garden are broadly the same — walk in when it's open! The Parks Department website has an interactive map showing the location of each community garden and its hours of operation. Drop by, and you can find volunteer members or a leader to help you get started… Additionally, each garden has a GreenThumb Community Engagement Coordinator, which the Parks Department recommends reaching out to as you search for the right garden. You can find this coordinator and their contact information on the community garden locator page."*
    - Source: John, A. (2023, October 11). How to join a community garden in New York City. *The City*. https://www.thecity.nyc/2023/06/07/how-to-join-community-garden/

  - NYC: *"Teens for Food Justice (TFFJ) fights food insecurity through school-based, youthled, hydroponic farming. We work to end the cycle of diet-related poor health outcomes, disproportionately impacting low-income communities of color… TFFJ students become 21st-century farmers growing large quantities of hydroponic produce inside their Title I schools, and are empowered to be educators, mentors, and advocates working to build a just, equitable, and sustainable food system for all… TFFJ students learn to build and run our school-based farms. Each farm grows up to 10,000 pounds of produce annually, providing fresh produce daily for lunch in the schools' cafeterias and distributed, free and affordably, within local food desert communities. TFFJ's afterschool programming educates students about the health and nutritional value of the food they grow and provides leadership training in food policy, civics, and advocacy. The students then share this information at the local events they run, with the administration within their schools, and with their local elected officials, guiding their communities towards healthier, food-secure futures."*
    - Source: Teens for Food Justice. (2022b, November 9). *Galvanizing a youth-led food justice movement!* https://teensforfoodjustice.org/wp-content/uploads/2023/02/TFFJ_TFFJ-Overview_1-PAGER_110922.pdf
    - Source: Teens for Food Justice. (2022a, July 27). *How it works* [Video]. YouTube. https://www.youtube.com/watch?v=5-5JK0loyAA

  - Harlem: *"Harlem Grown* [is] *an independent, non-profit organization whose mission is to inspire youth to lead healthy and ambitious lives through mentorship and hands-on*

education in urban farming, sustainability, and nutrition. Since 2011, we've operated local urban farms, increased access to and knowledge of healthy food for Harlem residents, and provided farm-based development programs to Harlem youth. Healthy habits start young, which is why our programs target elementary-aged students. Because food justice is more than just providing and distributing food, our model seeks to positively impact the entire community through mentorship, education, and partnerships to create sustainable change. One of the many ways we fulfill our mission is by raising support for the physical renovation of abandoned lots in Harlem, transforming them into thriving urban farms. Currently, we have 13 urban agriculture facilities ranging from soil-based farms, hydroponic greenhouses and school gardens."

- Source: Harlem Grown. (n.d.). *Who we are*. https://www.harlemgrown.org/about

- "*Tak*[e] *your kids berry picking this summer. With kids, especially younger ones, showing is often far better than telling. So show them when strawberries (and blueberries and raspberries and on and on) are in season in your neck of the woods. Have them taste the berry to see how much more flavorful it is than some store-bought produce, which is often picked before peak ripeness so it can travel great distances. Introduce them, if you can, to the local farmer who will benefit from your big day filling buckets in their berry patches. They'll learn fast just how much work goes into getting food on the table every day, and that locally grown, in-season produce is a better option – for both their taste buds and the planet."*
  - Source: Climate Reality Project. (2021b, April 21). *5 climate action chores for kids*. Climate Reality. https://www.climaterealityproject.org/blog/5-climate-action-chores-kids

- Divert from landfills

  - *"If you can't reduce wasted food, divert it from landfills. Nutritious, safe, and untouched food can be donated to food banks to help those in need."*
    - Source: Environmental Protection Agency. (2022a, April 8). *Preventing wasted food at home*. US EPA. https://www.epa.gov/recycle/preventing-wasted-food-home

  - *Community fridges can also house your donations "prepared meals, leftovers, you name it… Though food banks are great for storing large amounts of shelf-stable items like canned vegetables, they're not well-equipped to handle food that doesn't last as long and turns up in small amounts— a pizza slice here, a sandwich there. Those remnants make up much of the country's food waste, about 40 percent… The fridges also offer a degree of anonymity for those in need that's hard to find at more traditional food distribution centers, like food pantries. People don't have to sign up or prove their eligibility to use them. "The whole point is dignified, anonymous access," Zauderer said. "We're not the arbiters of how much to take."*

        - Source: Graham, M. (2023, October 26). *Community fridges don't just fight hunger. They're also a climate solution*. Grist. https://grist.org/food/community-fridges-food-security-climate-solution/

    - Compost organics. Look for local programs and groups to support you.

        - *"Composting lowers greenhouse gasses by improving carbon sequestration in the soil* [removing carbon dioxide from the atmosphere and storing it in the soil] *and by preventing methane emissions through aerobic decomposition, as methane-producing microbes are not active in the presence of oxygen."*
            - Source: Environmental Protection Agency. (2020, October). *Composting food waste: Keeping a good thing going*. https://www.epa.gov/snep/composting-food-waste-keeping-good-thing-going

        - Bushwick, Brooklyn composting - *"BK ROT is New York City's first community-supported, bike-powered, fossil fuel free food waste hauling and composting service. Our project is staffed by young people of color who haul residential and commercial organic waste and transform it into high quality compost. Our operations provide accessible jobs and sustained professional development for emerging environmental leaders."*
            - Source: *What's BK ROT?* (n.d.). https://www.bkrot.org/

        - Free options in NYC:

          Drop-Off Composting Sites. *"turn your food scraps and plant waste into compost and clean energy while reducing the amount of waste sent to landfills. You can access Smart Composting Bins 24 hours a day, 7 days a week, using a free, simple app. Smart Composting Bins are located throughout the city. They are emptied regularly."*
            - Source: *Drop-off composting sites*. (n.d.). City of New York Department of Sanitation. https://www.nyc.gov/assets/dsny/site/services/food-scraps-and-yard-waste-page/nyc-food-scrap-drop-off-locations

            - Note: Proposed 2024 city government budget cuts have put community composting drop-off sites—primarily run by nonprofits that rely on government funding—at risk. Private donations stepped in to temporarily rescue the programs, but much more money is needed to close the funding gap. "*In most of the city, food scraps placed in orange street corner bins and in brown curbside containers are not actually composted. Instead, most of the scraps get turned into a slurry, added to wastewater sludge and digested at the Newtown Creek Wastewater Resource Recovery Facility, a Brooklyn sewage treatment plant. Other food waste*

gets digested in western Massachusetts to create energy and farm fertilizer."

- Source: Maldonado, S. (2023c, December 11). Less compost, more methane gas and landfill loom in proposed budget cuts. *The City*. https://www.thecity.nyc/2023/11/28/budget-cuts-compost-methane-landfill/

NYC curbside composting. *"is continuing for residents that currently have service — there will be no suspensions or pauses. Service is year-round, and every week on your recycling day. Service is currently available in select Community Boards in the Bronx and Manhattan, and ALL Brooklyn and Queens residents. Bronx, Manhattan, and Staten Island will receive service beginning in October 2024."*

- Source: *Curbside composting*. (n.d.). City of New York Department of Sanitation. Retrieved February 1, 2024, from https://www.nyc.gov/assets/dsny/site/services/food-scraps-and-yard-waste-page/composting-residents-organics

- NJ composting - *"Un-Waste is an Organics Recycling and Microhauling business that takes food scraps from residents and small businesses to be recycled into premium compost, organic fertilizer, and renewable electricity at our partner facility, Trenton Renewables. This easy to use and seamless service is available to residents and businesses along the Central Jersey Shore."*
  - Source: Un-Waste. (n.d.). *Our company*. https://www.unwastemovement.world/about

- Support companies who not just reduce waste, but go a step further by **upcycling** and creatively using "waste" from one industry as an "ingredient" for another.

  - *"Kaitlin Mogentale…* [founded] *southern California-based Pulp Pantry… The company now offers four flavors of chips made from leftover juiced greens, including spinach, kale and celery – and occasionally some cucumber and Romaine lettuce. Chip flavors include salt, salt & vinegar, jalapeno lime and barbecue."*
    - Source: Gensler, H. (2022, August 3). Pulp pantry: How one woman is minimizing food waste. *HerMoney*. https://hermoney.com/enjoy/pulp-pantry-how-one-woman-is-minimizing-food-waste

- Look for local programs and organizations to help.

  - NYC: The **Food Waste Toolkit** is a *"free innovative digital tool that helps NYC residents and businesses identify the companies or organizations that can help them fight food waste at home and at work. Users can easily navigate the steps needed to reduce food*

waste before it starts, minimize impact in the kitchen and reuse food scraps for a better planet and community. This instructional manual will accompany an interactive database of Sanitation Foundation-approved food waste solutions vendors operating throughout the five boroughs."

- Source: Sanitation Foundation. (2021, June 24). *Food waste toolkit*. https://www.sanitationfoundation.org/fwf/food-waste-toolkit

- Pittsburgh, PA: *"412 Food Rescue was founded as a direct response to the disconnect between food waste, hunger, and environmental sustainability. We waste up to 40% of our food globally (translating to over 1.3 billion tons annually), while 1 in 7 people go hungry every day. According to ReFed, if we recovered about half (46 billion pounds) of the food being wasted, we could feed every hungry person in the United States 3 meals a day, every day. Not to mention, food waste is an environmental problem. Food production uses 10% of the energy budget, 50% of the land and 80% of all freshwater consumed in the United States. According to the Environmental Protection Agency, over 97% of food waste generated ends up in a landfill."*
  - Source: 412 Food Rescue. (2022, August 29). *412 Food Rescue - see how we're changing hunger and food waste*. https://412foodrescue.org/about-us/what-we-do

Disparate Impact: Sacrifice Zones, Fenceline Communities, and Concentrated Risk

- "*The climate crisis does not impact all communities equally – a fact that's been made crystal clear as too many low-income communities and people of color now face not just stronger storms and more lethal heatwaves, but compounding crises from air pollution to COVID-19.*"
  - Source: The Climate Reality Project. (2021b, May 13). *Let's talk about sacrifice zones*. Climate Reality. https://www.climaterealityproject.org/blog/lets-talk-about-sacrifice-zones

- These communities are known as sacrifice zones - "*places where residents are exposed to disproportionately high levels of toxic contamination in the air, water and soil.*"
  - Source: Herr, A. (2021, October 29). *What is a sacrifice zone? The environmental racism of oil drilling in L.A.* KCET. https://www.kcet.org/news-community/what-is-a-sacrifice-zone-the-environmental-racism-of-oil-drilling-in-l-a

- *"A new Harvard study monitored more than 7,000 sites across 18 states…disproportionate exposure in Black and Hispanic communities... for every additional industrial plant, military fire training area, or airport in a community, researchers found there was an up to 108 percent increase in perfluorooctanoic acid in drinking water and a 20 to 34 percent increase in perfluorooctane sulfonic acid, both types of forever chemicals."*
  - Source: Rodríguez, S. (2023, May 16). Forever chemicals are disproportionately polluting Black and Hispanic neighborhoods. *The Verge*.

https://www.theverge.com/2023/5/16/23725917/pfas-forever-chemicals-toxic-black-hispanic-pollution

- *"US counties with more Latino residents and American Indian residents have been burdened with 'significantly higher' concentrations of arsenic and uranium in their drinking water… 'The racial and ethnic makeup of your community should really not be connected to the quality of the water that you drink...' says Irene Martinez-Morata, lead author of the research…For decades, arsenic was widely used as a pesticide — leaving the carcinogen behind in soil and water. And there are more than 500 abandoned uranium mines on Navajo Nation land, some of which have poisoned water sources."*
    - Source: Calma, J. (2023, January 4). Uranium and arsenic in drinking water puts certain communities at greatest risk. *The Verge*. https://www.theverge.com/2023/1/4/23531529/uranium-arsenic-drinking-water-disparities

- Fenceline communities are "*next to a company, industrial, or service facility and are directly affected in some way by the facility's operation (e.g. noise, odor, traffic, and chemical emissions)."* Sacrifice zones "*are the geographic area that the fenceline communities live in. The sacrifice zone refers to the location the fenceline community calls home or resides in."*
    - Source: Herr, A. (2021, October 29). *What is a sacrifice zone? The environmental racism of oil drilling in L.A.* KCET. https://www.kcet.org/news-community/what-is-a-sacrifice-zone-the-environmental-racism-of-oil-drilling-in-l-a

- *"Often people of color are used as a proxy for low-income; however, studies such as Toxic Waste and Race published by the United Church of Christ's Commission For Racial Justice in 1984, document that even middle-to-upper income people of color communities suffer a disproportionate burden of pollution. The primary predictor of where a toxic waste site is located in this country is whether the location is in a community of color."*
    - Source: Shepard, P. (2016, October 10). *Building justice: NYC's sacrifice zones and the environmental legacy of racial injustice*. City Limits. https://citylimits.org/2016/10/10/building-justice-nycs-sacrifice-zones-and-the-environmental-legacy-of-racial-injustice

- *"Census tracts where the majority of residents are people of color experience about 40% more cancer-causing industrial air pollution on average than tracts where the residents are mostly white. In predominantly Black census tracts, the estimated cancer risk from toxic air pollution is more than double that of majority-white tracts.*"
    - Source: Younes, L., Kofman, A., Shaw, A., Song, L., & Miller, M. (2021, November 2). Poison in the air. *ProPublica*. https://www.propublica.org/article/toxmap-poison-in-the-air

- *"That the people living inside these hot spots are disproportionately Black is not a coincidence… These disparities are rooted in racist real estate practices like redlining and the designation of low-income neighborhoods and communities of color as mixed residential-industrial zones. In cities like Houston, for example, all-white zoning boards targeted Black neighborhoods for the*

siting of noxious facilities, like landfills, incinerators and garbage dumps. Robert Bullard, a professor of urban planning and environmental policy at Texas Southern University, has called the practice "PIBBY" or "Place In Blacks' Back Yard" — a spin on the acronym "NIMBY" ("Not In My Back Yard")."
    - Source: Younes, L., Kofman, A., Shaw, A., Song, L., & Miller, M. (2021, November 2). Poison in the air. *ProPublica*. https://www.propublica.org/article/toxmap-poison-in-the-air

- *"'Industries rely on having these sinks — these sacrifice zones — for polluting,' said Ana Baptista, an environmental policy professor at The New School. 'That political calculus has kept in place a regulatory system that allows for the continued concentration of industry. We sacrifice these low-income, African American, Indigenous communities for the economic benefit of the region or state or country.'"*
    - Source: Younes, L., Kofman, A., Shaw, A., Song, L., & Miller, M. (2021, November 2). Poison in the air. *ProPublica*. https://www.propublica.org/article/toxmap-poison-in-the-air

- *"I mean why is there a climate movement focused on emissions when you can get to the same, if not a better, more healthy environment by focusing on what's happening to the people next to those emissions. I mean we ought to care about the communities that are literally not breathing because the air is too bad and the water is polluted and the soil is...like the death of that black man on TV – George Floyd – is what is happening in black communities every day, especially here in South Louisiana and Cancer Alley on those Southwest side of Louisianan the South Mississippi, in Uniontown, Alabama. This is what's happening. These are just humans that we have agreed to as a society to devalue and to invisibilize and what we have to do is visibilize them."* - Colette Pichon Battle
    - Source: Johnson, A. E., & Blumberg, A. (2020, September 24). *Black lives matter and the climate*. In *How to Save a Planet*. Spotify. https://open.spotify.com/episode/3vO0O6COrqqB9HS710UWqa

The Power of Women and Girls

Why Women and Girls are Key

- *"Gender inequalities intensify vulnerability to climate change impacts, which in turn jeopardize hard-won gains on women's rights. Today, 10 percent of women live in extreme poverty. By 2050, under a worst-case climate scenario, up to 158.3 million more women and girls may be pushed into poverty globally. Gender-based violence increases in times of crisis, and the climate crisis is no different. For example, the 2022 drought in the Horn of Africa resulted in a nearly fourfold increase in child marriage in affected areas of Ethiopia. In Somalia, episodes of intimate partner violence and rape increased by 20 percent. Climate change is exacerbating water scarcity, which increases the burden of water collection and treatment on women and girls. Globally, every day, women spend 2.8 more hours than men on unpaid care and domestic work."*
    - Source: Turquet, L., Tabbush, C., Staab, S., Williams, L., & Howell, B. (2023). *Feminist climate justice: A framework for action: Conceptual framework prepared for Progress of the World's Women series*. UN Women.

https://www.unwomen.org/en/digital-library/publications/2023/11/feminist-climate-justice-a-framework-for-action

- *"Climate feminism is exactly what we need, because our planetary crisis has never been gender neutral. Climate change is a powerful 'threat multiplier,' making existing vulnerabilities and injustices worse. Especially under conditions of poverty, women and girls face greater risk of displacement or death from extreme weather disasters. Early marriage and sex work—sometimes last-resort survival strategies—have been tied to droughts and floods. There is growing proof of the link between climate change and gender-based violence, including sexual assault, domestic abuse, and forced prostitution. Tasks core to survival, such as collecting water and wood or growing food, fall on female shoulders in many cultures. These are already challenging and time-consuming activities; climate change can deepen the burden, and with it struggles for health, education, and financial security. Such realities make gender-responsive strategies for climate resilience and adaptation critical."*
    - Source: Wilkinson, K. K., & Johnson, A. E. (2020, September 22). Why we need more women leading the fight for the planet. *Elle*. https://www.elle.com/culture/a34111453/why-we-need-more-women-leading-the-fight-for-the-planet

- Here are five reasons why women are essential for climate action*:*
    - *"Climate action requires 100 percent of the population. Half of the world's population is comprised of women and girls, yet they are often left out of the conversation when it comes to climate change. We need women, in all their diversity, involved at all levels. Indigenous women, in particular, have been at the forefront of environmental conservation and have invaluable knowledge and expertise that can help build resilience and reduce greenhouse gas emissions.*
    - *Empowering women means better climate solutions… women can increase their agricultural yields by 20 to 30 percent… research shows that countries with high representation of women in parliament are more likely to ratify international environmental treaties.*
    - *Women are key to building climate resilience in communities… women are usually first responders in community responses to natural disasters, leaders in disaster risk-reduction, and contribute to post recovery by addressing the early recovery needs of their families and strengthening community building.*
    - *Climate change affects us all, but not equally. Women often face higher risks and greater burdens from the impacts of climate change in situations of poverty and due to existing roles, responsibilities and cultural norms… The consequences of climate change can increase the burden for women and girls, for example, causing them to travel further to obtain daily supplies, leaving less time for paid work and potentially exposing them to greater risk to their personal safety.*
    - *Countries recognize the importance of gender in climate planning. The Gender Action Plan agreed by governments under the UN Framework Convention on Climate Change (UNFCCC) calls for women's full, equal, and meaningful participation in the international*

climate process and to ensure a prominent role for women in decision-making and in climate action.
    - Source: UN Climate Change News. (2023, March 8). *Five reasons why climate action needs women*. UNFCCC (United Nations Framework Convention on Climate Change). https://unfccc.int/news/five-reasons-why-climate-action-needs-women

- *"An orthodox assumption frames gender equality as a panacea to the climate crisis, whereby empowering women is assumed to have tremendous positive effects on countries' environmental performances…* [d]*isregarding situated gender constructs, understanding gender as binary, and positing women as a homogeneous group, all mask multiple interactions between gender equality and climate change mitigation."*
    - Source: Rainard, M., Smith, C. J., & Pachauri, S. (2023). Gender equality and climate change mitigation: Are women a secret weapon? *Frontiers in Climate*, *5*. https://doi.org/10.3389/fclim.2023.946712

Inspirational Women and Girls Leading the Way

In Our Backyard

- Brooklyn - Hattie Carthan.
    - *"Her family migrated to New York in 1928, and she moved to Bed-Stuy in 1953… within a decade of moving to Vernon Avenue, the block had only three of the original trees remaining. What factors accounted for this dramatic loss in tree canopy?... Research shows that redlined neighborhoods like Bed-Stuy—those given D or 'hazardous' ratings by the Home Owners' Loan Corporation—'have on average ~23% tree canopy cover today.' The state of nature on her block spurred Carthan to reach out to fellow residents to make a change… One of Carthan's early initiatives was to finance tree replacement. The group organized a fundraising barbecue; at $1.25 per plate, they raised $200 in 1965. "They called me 'tree nut' and 'tree idiot,' but old age prevailed," she told the Times. Four new trees were planted on the block… Carthan is credited with starting the City's tree matching program in 1966. If a block association planted four trees, then the Parks Department would plant six more. Carthan's organizing acumen and charisma grew the Bedford-Stuyvesant Beautification Association, a group of 100 block associations that planted ginkgo, sycamore, honey locust, and elm trees in the community. You can still see some of these legacy trees in the neighborhood… Carthan knew the trees would not thrive without dedicated stewards, especially young children and teenagers. She formed the Neighborhoods Tree Corps in 1971, arguably another first in New York's urban forestry timeline, with a New York State Council on the Arts grant."*
        - Source: Silvera Seamans, G. (2023, March 14). *An African American tree activist lived in Brooklyn*. Brooklyn Botanic Garden. https://www.bbg.org/news/remembering_brooklyn_tree_activist_hattie_carthan

    - *"Hattie became known as 'the tree lady of Brooklyn,' but her work transforming the community didn't end there. In 1968, as part of a wave of redevelopment and urban renewal, the city of New York was slated to demolish four abandoned brownstones in*

Bed-Stuy, along with the nearly-century-old magnolia grandiflora tree towering outside them. For two years, Hattie organized against the redevelopment project until she was able to procure historical landmark status for the tree. In fact it's the only living thing in the city still landmarked today. Saving the magnolia spiraled into a way to reclaim three of the brownstones too: she convinced the city to sell them to her for $1,200. She turned the brownstones into the Magnolia Tree Earth Center - a space for children to get environmental education, including horticultural workshops, and lessons on how to care for and plant street trees. It's a place where Hattie's story continues to inspire generations of urban gardeners."

- Source: Chakraborty, R. [Vox]. (2021, June 7). *How radical gardeners took back New York City* [Video]. YouTube. https://www.youtube.com/watch?v=_g2CaF12xxw

- LES - Liz Christy.
  - *"It started with a seed bomb, in the Lower East side. At the time, it was another neighborhood struggling with abandonment and disinvestment. And in 1973, a local named Liz Christy was hoping to change it. 'At the very beginning, we were very radical.' That's Fon Loggins, one of Liz's friends and fellow gardeners. 'So we made these seed bombs, would go out in the evening and toss them over the fences. And next year it was full of flowers like a little meadow.' They had no legal access to spaces, but made it a mission to re-green unloved parts of the city. They started to call themselves the Green Guerillas.*

    Soon, the group turned their attention to one vacant lot here on Houston Street. She was walking by one day, this lot, and it was full of trash, three or four feet of trash. She went back home, called a bunch of us up and said, 'We have a project you might like to work on.' The group spent a year removing trash, and adding soil, fencing and plants. To take a space that was full of garbage and trash and green it, was a radical concept back then. What originally happened was the city came in and said, 'This is our property. You can't use it as a garden." In response, Liz called up the press and tried to get the word out about the Green Guerillas. And eventually, the city backed off.

    In April 1974, the City Office of Housing Preservation and Development offered them a lease for $1 a month to make it legal. The Green Guerillas named it the 'Bowery Houston Community Farm and Garden.' It became the first New York City-approved community garden. Soon, residents began planting vegetables, hosting workshops, and sharing knowledge with other gardeners. The community gardening movement exploded. People all across the city started getting $1 leases to turn abandoned lots into green spaces in their own communities. By 1985, there were around 1,000 gardens across the city."
    - Source: Chakraborty, R. [Vox]. (2021, June 7). *How radical gardeners took back New York City* [Video]. YouTube. https://www.youtube.com/watch?v=_g2CaF12xxw

- Manhattan - Jamie Margolin.
  - *"Margolin, 21…* [has] *been an activist since she was 14 — cofounding the advocacy group Zero Hour, writing a guidebook with Greta Thunberg for other young organizers, leading marches across the country, meeting with politicians and celebrities… Margolin started to worry that the youth climate movement had inadvertently created a capitalistic monster. Activists became social-media influencers and got brand deals… Now Margolin*

is focused on filmmaking as a form of activism… Margolin is Colombian American and grew up in Seattle. Her mom was raised in Bogotá. Margolin said she recognizes her privilege compared with Indigenous peoples on the front lines in Latin America. But she also wants to understand her family heritage and the land defenders whom she admires and to whom she feels indebted. "These are the people who are fighting and putting themselves on the line that have been ignored and mistreated, or the opposite — targeted and murdered," Margolin said. She wants to uplift those voices and stories in her films."

- Source: Boudreau, C. (2024, January 8). Women in climate leadership: Meet 10 leaders who refuse to let the climate crisis go unchecked. *Business Insider*. https://www.businessinsider.com/women-leaders-in-climate-crisis-2023-5

Across the Globe

- *"Women created the framework to limit global temperature rise. It must be noted that the Paris Climate Agreement would not be what it is today without women. A legendary group of climate leaders called the "lionesses," including Farhana Yamin, Christiana Figueres, and Tessa Tennant, met in the countryside of Scotland and came up with the guiding principle of 'net zero emissions' at a time when many parties to the climate convention were stuck in disagreements. There are many more founding mothers of the goal as the pride of lionesses expanded into a group of more than 30 lawyers, diplomats, financiers, and activists with the mission to limit global temperature rise to 1.5°C. These precise targets and clear language allowed global leaders to finally understand the urgency and, with a clear objective, begin to cooperate to create actionable policy."*
  - Source: Schueman, L. J. (2023b, September 15). *Why women are key to solving the climate crisis*. One Earth. https://www.oneearth.org/why-women-are-key-to-solving-the-climate-crisis/

- Nouhad Awwad, Ummah for Earth campaigner and global outreach coordinator, Greenpeace MENA *"People often view the environment as "something created for their benefit, rather than something that's their duty to preserve," she said. But Awwad believes protecting nature is a core part of her Islamic values. She works for Greenpeace… on its work for Ummah for Earth, an alliance of more than two dozen organizations that empowers Muslim communities to tackle the climate crisis. Awwad told Business Insider that talking to people through their faith values could be an effective way to spread awareness and mobilize climate action…*
  Awwad started Lebanon's chapter of the Arab Youth Climate Movement in 2015, and she was elected as the youth representative for YOUNGO, the official youth network of the United Nations Framework Convention on Climate Change in 2017. She said that socioeconomic factors in Lebanon could make engaging with environmental issues an "elite thing" for young people. Awwad added that a lack of funding and resources had made youth climate action in the Global South trickier.
  In her work with Ummah for Earth, Awwad and her colleagues created a free training program on solar-panel installation in Arabic, as resources on renewable energy are difficult to access in the language. She said about 2,000 young people applied for the program, and many of the trainees started their own solar-roof-garden initiatives."

    - Boudreau, C., Paradis, T., Lockwood, T., & Graham, F. (2023, November 27). Climate action 30: Top global leaders addressing the climate crisis in 2023. *Business Insider*. https://www.businessinsider.com/climate-action-30-global-leaders-climate-solutions-2023-11

- Cheryl Johnson, Executive director, People for Community Recovery is *"a lifelong resident of Altgeld Gardens in Chicago, a neighborhood surrounded by one of the largest concentrations of hazardous-waste sites in the US. She's also the daughter of Hazel Johnson, who is considered the mother of environmental justice. "Keeping her legacy alive is a huge passion of mine," Johnson told Business Insider. Johnson serves as the executive director of People for Community Recovery, a nonprofit her mother founded to improve the quality of life for communities affected by pollution.*
  Under her leadership, PCR has prevented hundreds of units in Altgeld Gardens from being torn down, led a program to remove harmful chemicals from residential homes, and stopped another landfill from being constructed in the community. Poorer communities, Johnson said, are more likely to experience the "devastating" impacts of the climate crisis because they don't have the necessary resources to respond.
  "People are not even aware to be prepared," Johnson said. "We need an environmental-remediation workforce to be able to prepare, to intervene, and to respond to issues that are related to our climate condition."
    - Boudreau, C., Paradis, T., Lockwood, T., & Graham, F. (2023, November 27). Climate action 30: Top global leaders addressing the climate crisis in 2023. *Business Insider*. https://www.businessinsider.com/climate-action-30-global-leaders-climate-solutions-2023-11

- Ayisha Siddiqa, Youth climate advisor to the UN Secretary-General *"is a human-rights and environmental activist. Growing up in Pakistan, Siddiqa saw the effects of pollution firsthand when members of her family and community became ill from unsafe drinking water, and she learned that conflict and war are linked to resource demand…*
  In 2020, she cofounded the youth-activist coalition Polluters Out and helped launch an activist training course called Fossil Free University. More recently, Siddiqa together with other activists successfully lobbied for the Loss and Damage Fund at COP27 to support the countries that are harmed the most by the effects of the climate crisis and to force fossil-fuel lobbyists to identify themselves when registering for COP28.
  Siddiqa currently serves as a youth climate advisor to the UN secretary-general. She's also on the steering committee of the Youth Climate Justice Fund, which aims to be the largest youth-led regranter in the climate space — meaning it secures grants to issue them to others. Looking ahead, she wants to continue her legislative work and help protect the planet for future generations.
    - Boudreau, C., Paradis, T., Lockwood, T., & Graham, F. (2023, November 27). Climate action 30: Top global leaders addressing the climate crisis in 2023. *Business Insider*. https://www.businessinsider.com/climate-action-30-global-leaders-climate-solutions-2023-11

Conclusion: Radical Empathy and Maintaining Hope

- *"I often teach from the framework of KAE: Knowledge, Empathy, Action. The empathy I speak of in that framework is a radical empathy—empathy that doesn't just say "I see you" or "I'm sorry for what you're experiencing." With radical empathy we ask the question, "In what ways does my existence play into your oppressions?" This offers a rational and solution-based approach to allyship and community care. This radical empathy is an on-ramp to a much more optimistic and rational approach to justice."* – Rachel Cargle
    - Source: Thomas, L., & Cargle, R. (2021, May 27). *Rachel Cargle and Leah Thomas talk Black climate optimism*. Atmos. https://atmos.earth/rachel-cargle-leah-thomas-intersectional-environmentalist/

- "*We have beautiful parks and things that have been outlined as a place to go experience nature, but we don't have nature throughout our existence. We don't see ourselves as part of an ecosystem. We see the ecosystem as a thing over there to go drive to on the weekends and be a part of. We commodify the very thing we need to survive when the environmentalists don't bring in racial justice. When you bring in racial justice, you cannot just focus on the rivers that you like to kayak. You've got to focus on the communities that are poisoned every day for you to get your gas to get to the river and go get in the kayak.*" - Colette Pichon Battle
    - Source: Johnson, A.E., & Blumberg, A. (2020, September 24). *Black lives matter and the climate*. In *How to Save a Planet*. Spotify. https://open.spotify.com/episode/3vO0O6COrqqB9HS710UWqa

- *"I started to identify as a climate optimist not because I'm ignoring the reality of the climate crisis, but because I want to stay rooted in the solutions that are available versus getting too bogged down in the doom. It keeps me motivated, imagining a better future than what we have now… Climate optimism for me looks like a deep belief that there will be Black joy and total liberation in the future."* – Leah Thomas
  *"We must offer ourselves—and each other—space to grasp onto that rest, joy, possibility, and freedom **now**, or we'll grind ourselves completely away simply surviving the oppressive pressures around us… These conversations about Black people finding liberation now, as well as the glory of a liberated future, act as buttresses to our climate optimism. The optimism lies squarely in the fact that there are Black people here now who deserve hope, and there are Black people in the future, and I want to do whatever I can to move the needle further toward our collective wellness, rest, and liberation."* – Rachel Cargle
    - Source: Thomas, L., & Cargle, R. (2021, May 27). *Rachel Cargle and Leah Thomas talk Black climate optimism*. Atmos. https://atmos.earth/rachel-cargle-leah-thomas-intersectional-environmentalist/

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