Environmental Injustice

Earth Day 2023

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Introduction

- Most of us either know someone who has experienced, or personally experienced ourselves, the fierce effects of climate disasters growing more intense over time.
- Every region of the US is affected by these expensive and destructive climate disasters.

*This map denotes the approximate location for each of the **18 separate billion-dollar weather and climate disasters that impacted the United States in 2022.***

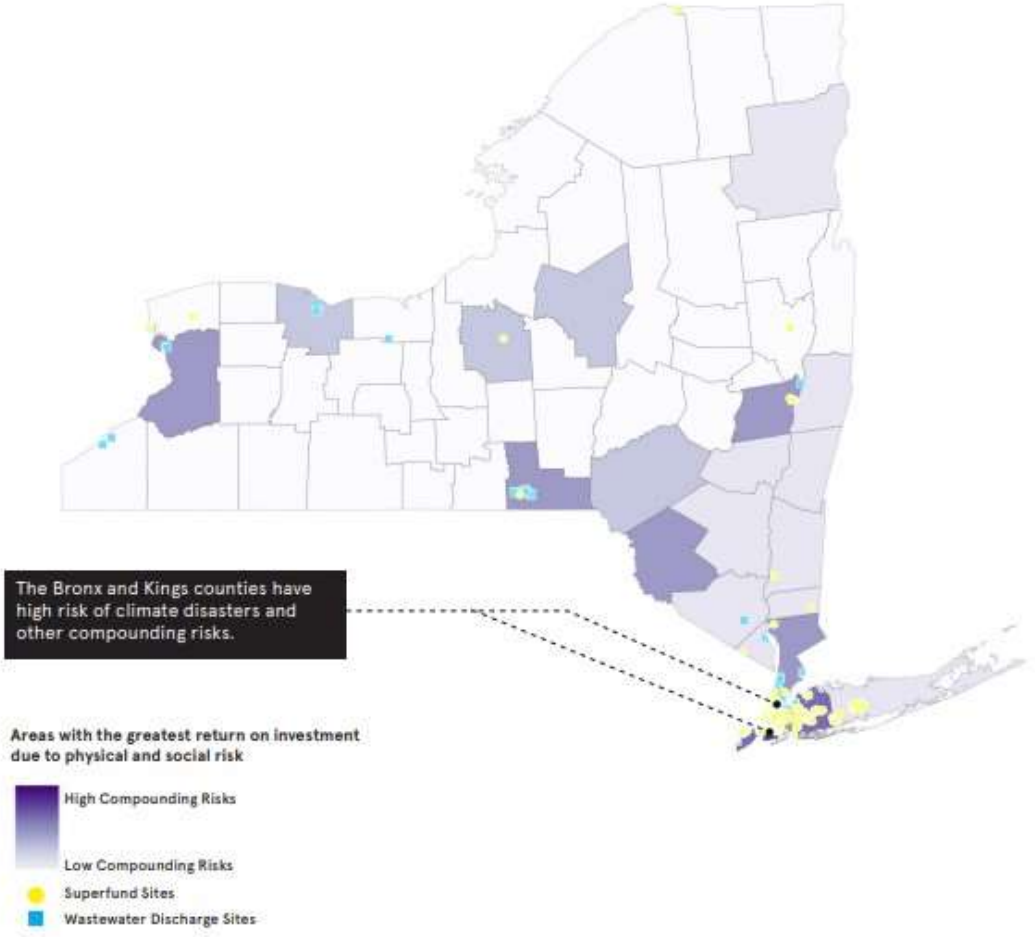
  - Source: Smith, A. B. (2023, January 10). *2022 U.S. billion-dollar weather and climate disasters in historical context*. NOAA Climate.Gov. https://www.climate.gov/news-features/blogs/2022-us-billion-dollar-weather-and-climate-disasters-historical-context

- *"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

- Extreme effects impact the Northeast US:
  - *"A year ago, 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

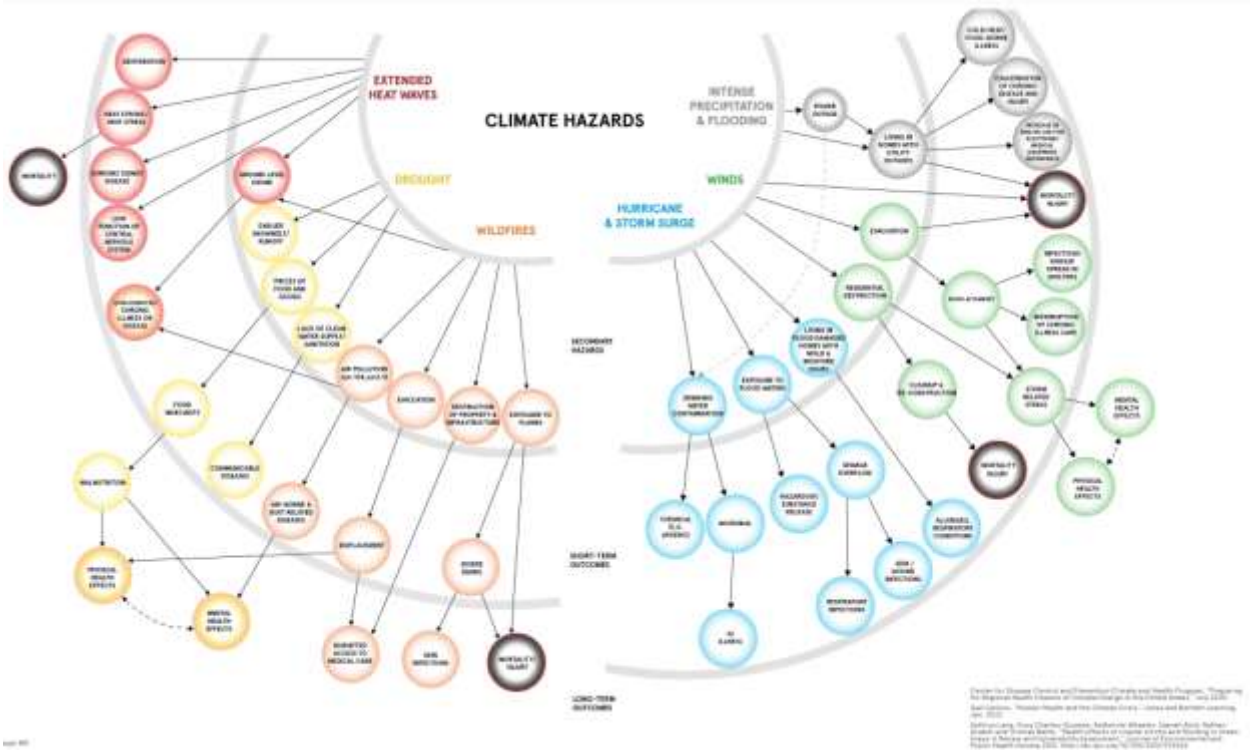
- *"The Bronx and Kings counties have high risk of climate disasters and other compounding risks."*



- Source: Chester, A., & Lawton, J. (2022). Atlas of disaster. In *Rebuild by Design*. Rebuild by Design. https://rebuildbydesign.org/wp-content/uploads/2022/12/ATLAS-OF-DISASTER.pdf

- *"The stretch of coastline from the tip of the Delmarva Peninsula in Virginia to the elbow of Cape Cod in Massachusetts is experiencing the greatest increase in sea level rise rate globally: 2 to 3.7 mm per year—more than three times the global average."*
  - Source: National Oceanic and Atmospheric Administration. (2020, September 30). *Northeast*. U.S. Climate Resilience Toolkit. https://toolkit.climate.gov/regions/northeast
- *"The Northeast has seen a greater recent increase in extreme precipitation than any other region in the United States—the region experienced more than a 70 percent increase in the amount of precipitation falling in "very heavy events" (defined as the heaviest one percent of all daily events) between 1958 and 2010. The frequency of these heavy downpours is projected to continue to increase over the remainder of the century."*

        - Source: National Oceanic and Atmospheric Administration. (2020, September 30). *Northeast*. U.S. Climate Resilience Toolkit. https://toolkit.climate.gov/regions/northeast
- 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
- 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/2022/12/ATLAS-OF-DISASTER.pdf

- Framing the Problem: Mitigation and Adaptation. *"Climate change mitigation [is] reducing the flow of greenhouse gasses into the atmosphere by replacing fossil fuels with renewable energy. But there's another aspect to the fight against climate change: adaptation. Adapting to life in a more dangerous climate involves building resilience to weather shocks — for example, by constructing a seawall or planting crops that can withstand droughts and floods. Mitigation is vastly more popular than adaptation… And yet… [f]or many people — especially poorer people in poorer countries — the problem is now. Climate change is already flooding their homes and causing them heatstroke. It would be unjust for richer countries that disproportionately created the problem to say "we … decid[ed] to frame the problem as a future event to be mitigated." Climate change is also a present event, so solving it also means addressing the problem as it*

exists today. Money spent to mitigate emissions will pay off over the long term but do little to protect a country from climate change right now.
One approach to adaptation is to direct funding to governments so they can build up the infrastructure — whether that's a seawall or a new irrigation system — to reduce the impacts of shocks… But implementing major projects like these can take time…
So a nascent approach to adaptation aims to help vulnerable people by giving them just-in-time cash transfers. That means free money, no strings attached, that recipients can use to improve their resilience in the days or weeks ***before*** *extreme weather hits… Recent experiments show how successful this approach is, making the case that anticipatory cash transfers should play a bigger role in climate adaptation."*
    - 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

- 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
- Climate change is expensive. *"Inflation dominated news headlines and American psyches in 2022… The causes were numerous… [b]ut in many sectors, the specter of climate change was also lurking… Extreme swings in temperature and precipitation caused shortages and soaring prices for essential utilities like electricity, heat, and water. A series of catastrophic weather disasters scrambled the supply chains for vegetables and staple grains. 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, putting homeowners in a bind: They 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

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#how

- 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. (2023a, February 16). Sulfur dioxide basics. US EPA. https://www.epa.gov/so2-pollution/sulfur-dioxide-basics#what%20is%20so2*

- 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. (2022b, August 2). *Basic information about NO2*. US EPA. https://www.epa.gov/no2-pollution/basic-information-about-no2#What%20is%20NO2

- 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: buildings (49%); non-road (19%); traffic (17%); electric generation (7%); and road dust (6%). 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.-d). *The public health impacts of PM2.5 from traffic air pollution*. Environment and Health Data Portal. https://a816-dohbesp.nyc.gov/IndicatorPublic/Traffic/index.html

In Our Backyard

Asthma Alley - South Bronx

- *"With some of the worst pollution levels in the US, the South Bronx has been nicknamed "Asthma Alley." In fact, 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. Mychal Johnson of South Bronx Unite is fighting for change."*
    - Source: Alexandria Bordas [alexandria bordas]. (2016, November 29). *Environmental racism - the South Bronx* [Video]. YouTube. https://www.youtube.com/watch?v=6rVZ-uZZP1w

- *"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. The researchers predicted there would be slight increases in air pollution and noise due to the increased traffic. Mott Haven is 67% Hispanic and 28% Black and has a poverty rate more than twice the NYC average. It also experiences more air pollution on average and higher rates of childhood asthma-related visits to the emergency department than the rest of the Bronx and the rest of the city.*
  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

New York City's 'Slow Violence'

- *"New York City Housing Authority's Cooper Park Houses'... environmental struggles are not just an issue of the past… Cooper Park is not unique. 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. Cooper Park 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. Too much ozone exposure is linked to negative outcomes during pregnancy and connected to cardiovascular and respiratory diseases… New York City ranks 14th in the nation for the worst urban areas for ozone pollution… 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… New York City is different: our 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.-b). *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.

  - *"**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

  - **The HOPE Program** *"envision[s] career paths for New Yorkers who are working to overcome systemic and other barriers. Our clients build skills in the green economy and bring climate mitigation tools to their communities."*
    - Source: The HOPE Program. (2022, December 14). *What we do - the HOPE program*. https://www.thehopeprogram.org/what-we-do

  - *"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*. https://www.uprose.org/mission

  - *"Founded in 1991, the **New York City Environmental Justice Alliance** (NYC-EJA) is 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

- **Air Quality**
  - Check the outdoor air quality in your neighborhood (app and website).
    - Source: *AirNow.gov*. (n.d.). https://www.airnow.gov
  - "*When the air is bad, move your exercise plans and other activities indoors.*"
    - Source: American Lung Association, & Lefohn, A. S. (2022, April 15). *State of the air: Recommendations for action* (J. Balmes & D. Manners, Interviewers). https://www.lung.org/research/sota/protect-yourself-community
  - *"Conserve electricity and purchase your power from clean, non-combustion sources if you can. Don't burn wood, leaves or trash. Learn more about how to reduce your impact with our Stand Up For Clean Air initiative at www.lung.org/air*"
    - Source: American Lung Association, & Lefohn, A. S. (2022, April 15). *State of the air: Recommendations for action* (J. Balmes & D. Manners, Interviewers). https://www.lung.org/research/sota/protect-yourself-community
  - Indoor air quality matters also. Gas stoves: *"You can take several steps to help protect your health and the planet… 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, experts said. "You just want to try to move air and bring in clean air," Brady Seals, a manager in the carbon-free buildings program at RMI, said, noting that people can 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

- Look for **local programs to reduce energy consumption** and **reliance on fossil fuels**.

  - 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: 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#request

  - 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

- 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://www.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

- Look for **local programs to combat 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: Wilson, M., & Blesener, S. (2022, March 19). A New York City clean-air program pays citizens to report idling trucks. *The New York*

Times. https://www.nytimes.com/2022/03/19/nyregion/clean-air-idle-car.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#whatis

- 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#whatis

In Our Backyard

New York City

- *"The National Weather Service measured more than three inches an hour at [Hurricane Ida's] peak. At least 13 people died — including 11 trapped in flooded basement apartments… Boulevards across boroughs could've been mistaken for rivers. Yankee Stadium became a lake. Waterfalls cascaded into subway stations… Ida's downpour — more than 7 inches in all in many parts of the city — overwhelmed a sewer system already hard-pressed to handle run-of-the-mill heavy rain…*
  Much of the city's network handles both waste and rain runoff in a single pipe. When rainfall exceeds the system's capacity, starting at about a tenth of an inch of rain per hour, untreated sewage bypasses treatment plants and makes its way directly into city waterways. Intensely concentrated rainfall adds the risk of flooding to the mix, when even the combined sewer system cannot keep up with the influx.
  Climate research commissioned by the city projected in 2015 that the number of days with rainfall of at least four inches would increase by as much as 67% by this decade compared to the period of 1971 to 2000. "It's hard to overstate on how many systemic levels this represents a clear and present danger," said Eddie Bautista, executive director of the New York City Environmental Justice Alliance, noting that the largest combined sewer overflows are located in communities of color. When it comes to storm drainage, he said, "We're taking it for granted at our own peril."
  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

- Combined Sewer and Stormwater System (video contains mild adult language): *"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

- 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

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

Queens - Newtown Creek

- *"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

- *"Having been used for commercial purposes since the 1800s, Newtown Creek became toxic thanks to the raw sewage, waste and chemicals dumped in the water from the nearby combined sewers, oil refineries, fertilizer factories, lumber yards and other heavy industrial uses. Over more than a century, oil companies spilled tens of millions of gallons of oil into the soils and aquifers in Greenpoint…*
  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. (2023c, 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

St. Lawrence River - Northeastern US and Canada

- *"Invisible chemicals changed the Mohawk way of life. They're probably in you, too. In the 1950s, the US and Canada embarked on a massive project to widen the St. Lawrence River, transforming the region to facilitate commerce, attract industry, and boost both nations' economies. But there was a third nation in the region whose people were not consulted, and whose lifestyle was completely transformed by the project: the Mohawk of Akwesasne.*
  The St. Lawrence River has been central to Mohawk culture in the region for thousands of years. The river's fish form the central part of their diet. But for the Mohawk, the fish aren't a "resource" to be used. They're an equal partner in a relationship in which both humans and wildlife have sacred responsibilities to one another. These relationships are central to the Mohawk worldview, and they mirror similar ways of understanding the natural world in other Indigenous communities.
  But the bid to lure industry to the region worked. Two major manufacturers built factories close to Akwesasne, and by the 1980s, the Mohawk learned that General Motors and Reynolds Metal had been poisoning the river for decades with cancer-causing chemicals called PCBs. Fish in the river were found to have extremely dangerous levels of PCBs. It presented the community

with a devastating choice: continue to fish and risk health problems like cancer and thyroid disorders, or stop fishing and lose the connection with the river, and with their ancestors."

- Source: Vox [Vox]. (2022, August 16). *How US corporations poisoned this Indigenous community* [Video]. YouTube. https://www.youtube.com/watch?v=WwGRM4QWFlQ&feature=youtu.be

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, Mississippi

- *"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."*
        - 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

- Remember the mantra from the 1990s - **reduce, reuse, recycle**? Those were presented in a specific order. We've essentially taken the last resort step - recycle - and made it the first

response. We need to **correct the priorities** - reduce consumption, and if something is needed, try reusing before buying new. If you need to stop using something, recycle it.

  - *"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

- *"**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#whatis

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

- *"**Use less water**: Use water-saving devices on sinks, in toilets, and in showers. Take short showers instead of baths. Do not run the water constantly while brushing your teeth. Wash clothes when you have a full load of laundry. Only water your lawn and plants when absolutely necessary."*
  - Source: Harvard T. H. Chan School of Public Health. (2013, September 11). *Water pollution*. Environmental Health Education Program. https://www.hsph.harvard.edu/ehep/82-2/

- *"Beyond guzzling water and gobbling energy, 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

- Look for **local programs** that help **keep recyclable products out of landfills and 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** collects unused fabric, clothing with imperfections, and fabric offcuts to sell to artists, crafters and students. Full rolls of fabric are cut into yards to be sold, while smaller pieces are offered for sale as is. Small scraps are shredded to create insulation, carpet padding, furniture lining, and moving blankets."*
      - Source: Downtown Brooklyn. (2021b, April 23). *Earth day spotlight: Brooklyn's innovators in sustainability*. https://www.downtownbrooklyn.com/news/2021/earth-day-spotlight-brooklyns-innovators-in-sustainability
    - *"**Revivn**, a hardware manufacturing company based in the Brooklyn Navy Yard, collects and repurposes reusable hardware. Through partnerships with non-profit organizations, the recycled electronics are sent worldwide to those in need of a working computer, phone, keyboard or other device."*
      - Source: Downtown Brooklyn. (2021b, April 23). *Earth day spotlight: Brooklyn's innovators in sustainability*. https://www.downtownbrooklyn.com/news/2021/earth-day-spotlight-brooklyns-innovators-in-sustainability
  - NYC: Become a **Harbor Protector**. They *"are environmental stewards that volunteer to keep our neighborhoods clean and pollution out of our waterways."*

"Catch Basin Cleanup: Catch basins collect rainwater and prevent litter from entering our sewer system and waterways. Harbor Protectors remove litter and leaves that can cover catch basins so that they function at their best."
"Catch Basin Stenciling: When people pour oils or dump garbage down catch basins, it pollutes our waterways. Harbor Protectors stencil an educational message near a catch basin to remind neighbors not to dump anything there!"
"Rain Garden Care: Rain Gardens prevent street flooding, beautify neighborhoods, and protect local waterways! Harbor Protectors remove litter and help our maintenance staff care for plants. Look for rain gardens near you."
"Shoreline Cleanup: When litter and debris washes up on our shoreline, it causes issues for local residents and wildlife. Harbor Protectors can partner with us on shoreline cleanup events!"

- Source: New York City Department of Environmental Protection. (n.d.). *Harbor protectors*. https://www1.nyc.gov/site/dep/whats-new/harbor-protectors.page

- 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 Wasted

What Food Goes to Waste?

- *"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

- *"'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, thereby saving the water, energy and money that are lost along with it… NRDC President Rhea Suh [said] "...[W]ith small steps, we can save large amounts of food —and along with it, money and precious natural resources. The more food we save, the more we can share with hungry Americans, the more we can reduce climate pollution, and the more water won't go to waste." 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

- *"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.*
  Some 931 million tons of it went to waste in 2019, according to the United Nations Environment Programme. Individual households were responsible for more than half of that, with the rest coming from retailers and the food service industry. New estimates show that about 17% of food available to consumers worldwide that year ended up being wasted. The matter is even more urgent when considered alongside another UN analysis that tracks the problem further up the supply chain, and shows 14% of food production is lost before it reaches stores. Waste is happening at every point, from the field to the dinner table.
  Food waste and loss are responsible for as much as 10% of global emissions, according to the Intergovernmental Panel on Climate Change… 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… Some governments are putting in nudges and incentives to change behavior, and this goes beyond creating awareness campaigns. For example, in South Korea, rubbish collectors charge homes based on the weight of their food waste. "Food waste is really an area where individuals can impact their personal carbon footprint," said Clementine O'Connor, who spearheaded the UNEP research. 'With the food that you buy, with how you take care of it and consume it, it's a daily chance to affect your own impact.'"
  - Source: Bloomberg Quicktake. (2021, April 8). *Food waste is a major climate problem* [Video]. YouTube. https://www.youtube.com/watch?v=PwTqA9q2L4Y

- *"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/#overview

- *"Global hunger isn't about a lack of food. Right now, the world produces enough food to nourish every child, woman and man on the planet. But nearly a third of all food produced each year is squandered or lost before it can be consumed. 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

- *"In high-income countries, 40 percent of food is wasted because people buy more food than they can consume. In low-income countries, where the vast majority of the world's hungriest people live, most food loss occurs during the early stages of growth, harvest and storage. 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

- *"When food is discarded, all inputs used in producing, processing, transporting, preparing, and storing discarded food are also wasted. 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

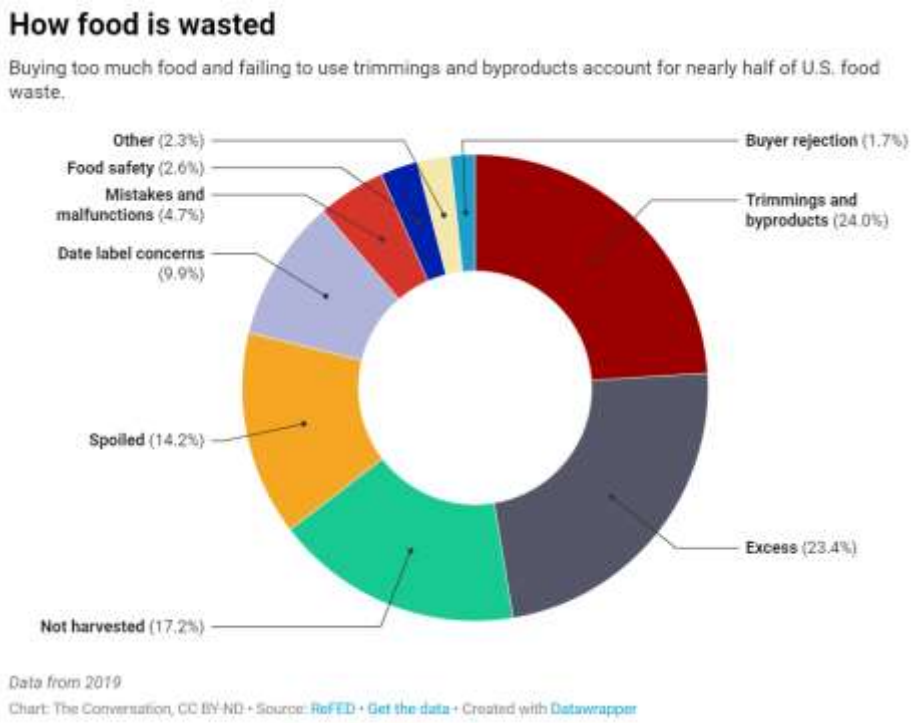
- *"By some estimates... 83% of food waste occurs at consumer-facing businesses (40%) and in homes (43%) according to ReFED (2016). Further, in the aggregate, this waste can create system-wide spillovers through increased prices, decreased availability of food, and increased environmental and resource 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

- *"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… This notion – a focus on food waste prevention, and solutions that address it directly – applies across the food value chain: from household behaviours and attitudes to entrenched practices and attitudes in food service, retail, processing and on farms. 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

Why Do We Waste Food?

- *"How food is wasted: Buying too much food and failing to use trimmings and byproducts 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

- *"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

In Our Backyard

New York City

- *"1.3 million tons of food in New York City get thrown away each year."*
    - Source: https://www.foodwastetoolkit.com/

- 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, October). *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 city's new "Smart Bins," which can be opened at any hour with a cell phone app, are a key component of the Department of Sanitation's bid to make food waste recycling easier for all New Yorkers — along with curbside organics pick-up, which DSNY plans to roll out citywide by the fall of 2024. Organic material currently makes up about a third of New York City's garbage stream. When it's sent to landfills, it creates methane, a potent greenhouse gas that contributes to climate change.*
  Astoria resident Jack Bernatovicz dropped his food waste into a "Smart Bin" on the corner of 24th Street and 34th Avenue in Queens. "It's easy to just collect the compost in my freezer, and when I need a little walk, I drop it off," he said. "It's built into my routine." Bernatovicz began separating his food scraps consistently when DSNY rolled out the first Smart Bins in Astoria as part of a limited pilot in December 2021. DSNY is aiming to install 400 Smart Bins throughout

the boroughs, with about 250 in place now. Drop-off sites across the city, like those in community gardens, only accept fruit, vegetables, tea bags and coffee grounds. But Smart Bins… accept meat, fish, bones, dairy products and even plastic bags. That's because 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 the borough's material from landscapers... A machine called the Tiger separates plastic bags and other contaminants from food waste brought in all over the city… 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. (2023b, 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

Across the Country

- *"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 — and the combined pressures of inflation, geopolitical conflict and climate change will only worsen the strain on global food production… The private sector squanders billions of pounds of nutritious food annually. And while the Food Donation Improvement Act can help curb this crisis, there is much more work to do. It's not enough, going forward, to simply make it easier to donate food to populations in need. There needs to be incentives, and even requirements, to do so… [M]embers of the 118th Congress can also provide a carrot, significantly expanding available tax incentives for food donations by passing another bill already in the legislative pipeline known as the Further Incentivizing Nutritious Donations, or FIND, Food Act… Governors nationwide can also help by following the example of New York and California — states that already have laws in place requiring donations from certain businesses with high food volumes and safety checks in place."*
    - Source: Little, A. & Bloomberg. (2023, January 6). America's food waste problem is a hunger solution in disguise. *Washington Post*. https://www.washingtonpost.com/business/americas-food-waste-problem-is-a-hunger-solution-in-disguise/2023/01/06/a6f5ba22-8dbe-11ed-b86a-2e3a77336b8e_story.html

- *"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

- *"Food Waste in* [US] *Landfills Nearly Triples - The amount of spoiled food going to 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

Actions to Take

- Planning and Shopping
    - *"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".*
    - *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 food 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
  - *"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

- Storage
  - *"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

- Cooking and Preparation
  - *"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.*
    - *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
    - *"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

- Use tools to simplify saving food and avoiding waste:
    - *"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.*
      ***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.*
      ***Alexa** - The world's first voice-activated, food-saving assistant. Ask about everything from better food storage to what you can do with wilted celery."*
        - Source: Natural Resources Defense Council. (n.d.). *Planning*. Save the Food. https://savethefood.com/planning

- **Buy local** 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

- Involve friends and family, even kids, in **understanding what it takes to grow food**.
    - Get involved in your local community garden.
    - "*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

- Rescue food from being wasted at restaurants and stores. Global: **Too Good To Go** App *"Too Good To Go helps everyday people fight food waste in their local communities by connecting them to restaurants and grocery stores with surplus meals and ingredients through an easy-to-use app. Once registered, users can choose from their favorite local spots to pick up meals – everything from bagels to dim sum, or ingredients like apples and avocados, for a third of the normal price. This presents a win-win-win solution in which consumers get great food (presented in a Too Good To Go "Surprise Bag"), store owners no longer throw away delicious surplus, and we, together, help the planet by reducing waste."*
    - Source: Too Good To Go. (2020, September 29). *Too good to go offers New Yorkers a new way to fight food waste* [Press release]. https://www.toogoodtogo.com/en-us/press/nyc-launch

- *"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. Compost food scraps rather than throwing them away."*
    - Source: Environmental Protection Agency. (2022a, April 8). *Preventing wasted food at home*. US EPA. https://www.epa.gov/recycle/preventing-wasted-food-home

- Compost organics to keep them out of the landfill and prevent methane buildup. 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/

- NYC citywide drop-off composting - *"Use the map to find locations where you can drop-off your food scraps* [which] *are processed locally at community scale compost sites.*" Mainly community-hosted designated drop-off spots, community gardens, and farmer's markets.
  - Source: NYC Department of Sanitation. (2022b). *Drop-off composting*. https://www1.nyc.gov/assets/dsny/site/services/food-scraps-and-yard-waste-page/nyc-food-scrap-drop-off-locations

- NYC curbside composting - *"Curbside Composting is expanding to all NYC residents: Brooklyn on October 2, 2023, Bronx and Staten Island on March 25, 2024, and Manhattan on October 7, 2024. Service is currently available in select Community Boards in the Bronx, Brooklyn, and Manhattan. Collection has resumed in all of Queens – compost will be picked up on the same day as recycling. No sign-up needed."*
  - Source: NYC Department of Sanitation. (2022). *Curbside composting overview*. https://www1.nyc.gov/assets/dsny/site/services/food-scraps-and-yard-waste-page/overview-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
  - "*Partnering with over twenty NYC breweries, **Rise Products** upcycles the grain that is a by-product of the beer-making process into nutritious flour that has twelve times the fiber and twice the protein of all-purpose flour. Amongst those putting their product to good use is **Runner & Stone** who uses the flour for their signature delicious bread."*
    - Source: Downtown Brooklyn. (2021b, April 22). *Earth day spotlight: Brooklyn's innovators in sustainability*. https://www.downtownbrooklyn.com/news/2021/earth-day-spotlight-brooklyns-innovators-in-sustainability

- 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. (2021c, 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

- 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 (episode 7). Gimlet Media. https://gimletmedia.com/shows/howtosaveaplanet/39habgl/black-lives-matter-and-the-climate (includes Transcript)

The Power of Women and Girls

Why Women and Girls are Key

- *"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. However, the gender-climate nexus literature often disregards feminist epistemology, detrimentally integrating harmful gendered assumptions within its analyses, and therefore policy recommendations… Results showed that… [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. Unveiling these interactions necessitates better integration of radical gender theories within climate change science through interdisciplinary research, permitting epistemological pluralism."*
  - 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

- Pittsburgh - Clara Kitongo. *"Trees are a critical solution for climate change. They help draw down carbon from our atmosphere, restore the land, provide a refuge in shade and shelter, and create important connections between people and nature. Clara Kitongo, who was born and raised in Uganda, is a program coordinator at Tree Pittsburgh. She takes pride in educating and empowering youth through the One Tree Per Child Program. Listen as Clara shares her story, how she found the power of her voice, and her passion to be part of the solution."*
  - Source: Project Drawdown. (2022a, March 15). *Clara Kitongo: Going to the roots to find your climate power* (M. Scott, Interviewer) [Video]. YouTube. https://www.youtube.com/watch?v=661d2mNHs9Y

- Brooklyn - Hattie Carthan.
  - *"Hattie Carthan (née Lomax) was born in Virginia in 1900. Her family migrated to New York in 1928, and she moved to Bed-Stuy in 1953. The "tree lady" moniker came about after Carthan moved to a tree-lined block in Brooklyn. She recalled to the Times that 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? A likely scenario was the combination of natural stand decline and municipal disinterest in replacing street trees in a redlined neighborhood… 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… Carthan made the connection between T&T and TNT or dynamite, explains Ena McPherson, a 20-year resident, gardener, and activist in the neighborhood. Recognizing the power of the Black community to make change was "the essence of the movement" Carthan seeded in Bed-Stuy, says McPherson.
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). *Missing chapter: How radical gardeners took back New York City* [Video]. YouTube. https://www.youtube.com/watch?v=_g2CaF12xxw&feature=youtu.be

- 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). *Missing chapter: How radical gardeners took back New York City* [Video]. YouTube. https://www.youtube.com/watch?v=_g2CaF12xxw&feature=youtu.be

Across the Globe

- *"Sumarni Laman. As global temperatures increase, the fire season in Kalimantan has grown longer and more deadly, destroying biodiversity, homes, and livelihoods for local communities. Growing up in this lush island landscape in Indonesia, Sumarni Laman fights for her home's survival as the coordinator for Youth Act Kalimantan and heading The Heartland Project, which raises awareness about deforestation across Indonesia and counters its effects through tree planting. The project also educates local communities about plastic pollution and climate action."*
  - Source: Schueman, L. J. (2022, July 29). *Climate hero: Sumarni Laman*. One Earth. https://www.oneearth.org/climatehero-sumarni-laman

- *"Coming from a line of strong women activists from the Indigenous Kichwa Sarayaku community, a remote village in the southern part of the Amazonic region of Ecuador, Helena Gualinga continues her family's legacy of fighting for nature. Co-founding the organization Polluters Out in direct response to the failure of COP25 to do more to remove fossil fuel industries from influencing world governments and markets. The coalition of youth activists works with adult and scientist allies to get all governments to reject big polluter sponsorship in any capacity and kick them out of Indigenous lands."*
  - Source: Schueman, L. J. (2023, March 16). *Climate hero: Helena Gualinga*. One Earth. https://www.oneearth.org/climate-hero-helena-gualinga

- *"Xiye Bastida, co-founder of Re-Earth Initiative: Climate activist and member of Mexico's Indigenous Otomi-Totec people, Xiye made her debut on the world stage at age 15, when she stood in for her father — a scholar in Indigenous land preservation — at the World Urban Forum in Malaysia… Bastida' speech about sustainable development drew on a story from her childhood, when a university made an ill-fated attempt to build near a wetland in her community… Last year, she addressed both President Joe Biden's Climate Leaders Summit and COP26, harshly criticizing the actions of countries in the Global North for continuing actions that pollute "sacrifice zones" in both the Southern hemisphere and in Black, Brown and Indigenous communities in North America."*
  - Source: Clancy, H. (2022, March 7). 25 more badass women shaping climate action. *Greenbiz*. https://www.greenbiz.com/article/25-more-badass-women-shaping-climate-action

- *"Susan Chomba, Director of Vital Landscapes, WRI Africa: A scientist with a Ph.D. in forest governance from the University of Copenhagen, Susan Chomba cultivated her interest in the environment on her family's small farm near Mount Kenya… Joining the World Resources Institute in April, [h]er new role builds on [her leadership of Regreening Africa], centering on developing approaches in climate change mitigation and adaptation, reducing poverty and enhancing gender equity, reversing biodiversity loss, building resilience in agriculture and food systems, and enhancing access to clean energy."*
    - Source: Clancy, H. (2022, March 7). 25 more badass women shaping climate action. *Greenbiz*. https://www.greenbiz.com/article/25-more-badass-women-shaping-climate-action

- *"Sônia Guajajara, Executive Coordinator, Association of Indigenous Peoples of Brazil: Brazilian activist Sônia Guajajara is a passionate and public advocate for Indigenous rights. Born on Araribóia Indigenous Land in the state of Maranhão, Guajajara ran for federal office in 2018. Deforestation has been a central focus for her organization, the Association of Indigenous Peoples of Brazil (APIB). Last month, the group rallied vocally around a related cause — the increase of allegedly illegal mining interests in the Brazilian Amazon — with a report suggesting that Capital Group, BlackRock, Vanguard and others have collectively invested almost $15 billion in nine mining concerns staking claims in Indigenous territories. "We cannot go on living side by side with activities that force Indigenous peoples to mourn the daily murder of our relatives, or to witness the destruction of biomes which we guard, in order to give way to projects that generate no real development but only destruction and projects for a handful of individuals," Guajajara said in a statement."*
    - Source: Clancy, H. (2022, March 7). 25 more badass women shaping climate action. *Greenbiz*. https://www.greenbiz.com/article/25-more-badass-women-shaping-climate-action

- *"Destiny Hodges, founder and Co-Executive Director, Generation Green: Communications specialist Destiny Hodges, who's wrapping up her final year at Howard University in Washington, D.C., is pioneering a movement she calls "environmental liberation." She's one of several Gen Z Black women — many of whom met at the annual HBCU Climate Change conference — who in 2019 created Generation Green, a nascent nonprofit aimed at "uplifting" the work of environmental leaders who identify with the Afrikan Diaspora — and educating a broader community about the impact. Hodges describes climate change as "another form of genocide" being inflicted on Black communities. "I started thinking about starting a nonprofit specifically that was a safe space for Black people, primarily Black youth, to really explore what environment means to them, and to just be in a safe space," Hodges said in February 2021. "I think that's so hard to find in this movement, in this work, especially as a young person … and even in the youth climate movement, that's not a safe space for Black youth."*
    - Source: Clancy, H. (2022, March 7). 25 more badass women shaping climate action. *Greenbiz*. https://www.greenbiz.com/article/25-more-badass-women-shaping-climate-action

- *"Durreen Shahnaz, Founder and CEO, Impact Investment Exchange: Durreen Shahnaz is the founder of Impact Investment Exchange (IIX) and its related foundation, which both focus on connecting the "Back Streets of underserved communities to the Wall Streets of the world." As*

of late January, the organization's work had "unlocked" about $235 million in private-sector investments supporting women-focused enterprises in India, Indonesia, Cambodia and the Philippines. The proceeds have been used for initiatives ranging from financing electric transport to addressing water and sanitation infrastructure to installing solar panels. The organization's Women's Livelihood Bond for climate series — gender-focused social bonds first listed on the Singapore stock exchange in 2017 — are considered the first impact investing instruments to be listed for public trading."

  - Source: Clancy, H. (2022, March 7). 25 more badass women shaping climate action. *Greenbiz*. https://www.greenbiz.com/article/25-more-badass-women-shaping-climate-action

- *"Gloria Walton, President and CEO, The Solutions Project: Gloria Walton sits on multiple government grant and philanthropic funds outside of The Solutions Project and across all her roles, she helped move $112 million in grants to frontline climate justice groups in more than 30 states. Walton is drawing on more than 16 years as a community organizer in Los Angeles and her childhood experiences in Jackson, Mississippi, to uplift climate "solutionaries" (many of them women) within BIPOC communities. Two years ago, to bring more attention to BIPOC contributions to the climate movement — and to highlight the traditional lack of representation for these communities at high-profile climate gatherings — she spearheaded the creation of Black Climate Week, marked this year during Black History Month in February. "When you live in an under-resourced community, you show up for one another in times of need. It was this kind of care that allowed me to see that my community is and has always been natural caretakers of the planet and of each other," she wrote in a recent essay. "The climate movement is deeply intersectional; it's more than sea level rise and forest conservation — it's about labor and workers, it's about food justice, it's about transit, it's about public health and housing, and it's about accessibility to resources."*
  - Source: Clancy, H. (2022, March 7). 25 more badass women shaping climate action. *Greenbiz*. https://www.greenbiz.com/article/25-more-badass-women-shaping-climate-action

Conclusion: The Ecosystem Connects Us All

- "*When environmental groups are not thinking broadly enough on racial justice, we get what we have right now. 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. (Hosts). (2020, September 24). Black lives matter and the climate (No. 7) [Audio podcast episode]. In *How to Save a Planet*. Gimlet Media. https://gimletmedia.com/shows/howtosaveaplanet/39habgl/black-lives-matter-and-the-climate (includes Transcript)

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