The diagnosis is clear: Climate change is wreaking havoc across the globe.

The impact of climate change is traumatically apparent across the world, especially in causing extreme weather conditions that result in loss of life and property. In August alone, fire and rain caused massive destruction in the U.S. High temperatures and dry conditions contributed to the rapid spread of the French Fire in central California, left, that began on Aug. 18 and scorched more than 26,000 acres. On Aug. 29, Hurricane Ida slammed into Louisiana, right, with some of the strongest winds to hit the state, and then took a catastrophic path up to the northeastern corner of the country, causing massive flooding and damage along the way.

VITAL SIGNS

Now the question is how much public willingness exists in the Pittsburgh region and beyond to mitigate future destruction. By Don Hopey

The global climate crisis has been called the story of our lifetime. That likely is an understatement.

All six of the hottest years on record have occurred since 2014, and 2020 was either comparable to the hottest year, 2016, or in the top three, according to the United Nations' Intergovernmental Panel on Climate Change August report.

Also in 2020, sea levels — topped off by melting glaciers and ice sheets, and expanding warmer water — rose for the ninth consecutive year and now measure 3.6 inches higher than they were in 1993, when satellite tracking began. The rate of that increase has doubled since 2006, the IPCC report said.

The sixth report from the IPCC analyzed 1,400 studies and relied on refined computer modeling to predict that droughts, floods and extreme weather events will become more common and more severe. It concluded, with some significant certainty, that the Earth is hurtling toward some dire and devastating climate impacts and cannot avoid some of them, even if governments act with uncharacteristic focus and unprecedented speed.

"We've already seen a lot of climate disruption and are seeing more crazy weather," said Larry Schweiger, who headed the Western Pennsylvania Conservancy from 1996 to 2004 and the National Wildlife Federation from 2004 to 2014. "It's happening faster than what was predicted because the scientific fabric is one of caution, but in this case it's more caution than the situation demands. We're actually sitting on a ticking time bomb, but we're not acting like it."

Around the globe in the last two years, swarms of locusts invaded Kenya; forest fires devastated parts of Greece; and Super Typhoon Goni, the most powerful storm ever to make landfall, whipped the Philippines with 195 mph winds.

In the U.S., heat waves roasted regions of the country and record-setting wildfires burned through bone-dry western forests, sending ash and soot aloft

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to degrade air quality as far away as the East Coast. Wildfires caused the closing of the Boundary Waters Wilderness Area in Minnesota and necessitated the evacuation of canoeists and campers. New York City's subway system was flooded — twice — the second time by remnants of Hurricane Ida, a late summer storm that killed more than 80 people. A string of tornadoes across six states in December caused devastation that left around 100 dead.

In roughly that same time frame, construction was nearing completion on the taxpayer-subsidized Royal Dutch Shell ethane cracker plant in Beaver County, 40 minutes northwest of Pittsburgh. In 2022, it's scheduled to begin producing more than 1.6 million tons of polyethylene plastic pellets annually while, according to its state permit, being allowed to emit each year 2.2 million tons of carbon dioxide, a potent greenhouse gas. That's the equivalent to the emissions from 440,000 vehicles — half of all the cars in Allegheny County — for a year, said Matt Mehalik, executive director of the Breathe Project, an air quality advocacy group. Allegheny County is home to Pittsburgh, Western Pennsylvania's largest city.

"Adding that much climate pollution is significant," Mr. Mehalik said. "It's something the region needs to contemplate before it locks in that much pollution. We risk being labeled a climate-destroying region. We have to be careful."

Additional ethane cracker plants are in various stages of discussion and development just across Pennsylvania's western border in Ohio and West Virginia. Those could eventually make the tri-state area a petrochemical hub, although the southeast Ohio cracker complex is on "indefinite hold" while financing is sought. And the West Virginia development is even less definite at this time, according to Sandy Buchanan, executive director of the Institute for Energy Economics and Financial Analysis, a Lakewood, Ohio-based nonprofit.

"People cheerleading the Shell plant need to think about how their position will look 10 or 20 years from now," Mr. Mehalik said, "and take into account the heat, the storms, the flooding, and whether it makes sense to go down that path."

In fact, like the rest of the country, the impact of the climate crisis has accelerated in Pennsylvania even as plans for industrial expansion press forward. The increase in storms and flooding has caused major damage across the state while the warming climate has enticed a host of invasive plants and insects to feel at home and proliferate, creating additional environmental concerns.

Plant invaders include giant hogweed, purple loosestrife, multiflora rose and kudzu, "the vine that ate the South." Among the outsider insects are the emerald ash borer, which has decimated the traditional wood stock for baseball bats; the hemlock woolly adelgid, which is killing the Eastern hemlock, Pennsylvania's state tree; and the spotted lanternfly, which threatens economic havoc on the state's apple and stone fruit (peach, plum, cherry) trees and grape vineyards. As non-native black-legged ticks, also known as deer ticks, have proliferated during recent mild winters, the state's incidence of Lyme disease has risen to the highest in the nation.

Christine Graziano, founder and president of Plant Five for Life, said the loss of Pennsylvania trees is occurring as global forest canopies are rapidly shrinking due to agriculture and development. In Allegheny County, she said, that loss translates

94,571 miles

Pennsylvania has 94,571 miles of oil and gas pipelines, and pipeline construction compounds climate change impacts by destabilizing soil, which can lead to landslides and destructive accidents, and by clearing the rights-of-way of native plants and trees.

to the equivalent of about 1,000 trees a day and contributes to soil erosion, flooding, loss of cooling shade during heat waves, and siltation of creeks and rivers that degrades water quality and damages aquatic habitat.

"This loss is meaningful and significant," Ms. Graziano said, "a contributing factor in compounding and cascading risks and systems failures of which we are already seeing the negative and too often catastrophic results."

And the harmful results of climate change go beyond direct impacts on air, water and land. After days of heavy rain in September 2018, a landslide triggered the fiery, bomb-like explosion of the Revolution Pipeline in Center Township, Beaver County, that burned for two hours and destroyed a home, caused the evacuation of 25 others, collapsed six high-voltage transmission towers and killed several pets. Two-and-a-half years later, in February 2021, Energy Transfer's 24-inch pipeline went back into service on a flatter route that avoided the still unstable hillside.

Karen Gdula, who lives on Ivy Lane, just 1,300 feet from the pipeline blast site, said she's happy the pipeline is on flatter ground and that Energy Transfer agreed to a request by residents that it bury the pipeline 20 feet deep where it crosses another pipeline near the site of the explosion.

"We need to be safe going forward," Ms. Gdula said. "We recognize the pipeline is here to stay. We're not protesters. But we let Energy Transfer know about our concerns."

The FracTracker Alliance, a nonprofit that evaluates the risks of oil, gas, and petrochemical development, released a new analysis this year of data from the U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration and found that from 2010 through August 2021, there were 407 "incidents" nationwide in which natural forces — heavy rain, erosion, lightning, temperature, high winds — caused damage to gas transmission, gas distribution and hazardous liquid pipelines.

Erica Jackson, FracTracker's manager of community outreach and support, said there are already 94,571 miles of oil and gas pipelines in the state, and pipeline construction compounds climate change impacts by clearing rights-of-way of native plants and trees and destabilizing soil, especially on steep slopes where landslides can occur, damaging wetlands, streams and groundwater.

Terrie Baumgardner, a member of the Clean Air Council and a resident of Aliquippa, two-and-a-half miles from the pipeline explosion site and four-and-a-half miles from the ethane cracker plant, said that more and stronger storms will likely mean more pipeline problems.

"Once the cracker plant goes online," she said, "it will need the gas supplied by 1,000 new wells every three to five years, and that means building more gas-gathering pipelines, transmission pipelines and ethane lines." A warmer climate also means more and longer heat waves and temperature inversions that trap industrial and vehicle pollution in the region's river valleys where they disproportionately affect disadvantaged communities.

2.2 million tons

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Walter Lewis is president and chief executive officer of Homewood Children's Village, which supports childhood and community development in that neighborhood, among the areas with Pittsburgh's highest poverty rates. He said climate change impacts aren't always recognized by residents as equity or environmental justice issues. But severe storms that cause roofs to leak and basements to flood produce financial hardship for low-income families and can damage whole communities. Extended hot weather can lead to hospital visits for those without air conditioning.

"Those types of things disproportionately affect our community and should be mitigated by addressing the causes of climate change," Mr. Lewis said. "But in the meantime, we have to do more, especially for the vulnerable in our community."

He said the Homewood Children's Village has held workshops on climate change and mitigation for neighborhood residents and worked with the Green Building Alliance to promote home energy efficiency.

"For a lot of people who maybe are having trouble paying their rent or are worried about their next meal, climate change is not on their radar," Mr. Lewis said. "But as they start talking about the issues that are on their radar, they see the links." h