THE GREAT CLIMATE MIGRATION

By Abrahm Lustgarten | Photographs by Meridith Kohut
ALTA VERAPAZ, GUATEMALA. Carlos Tiul, an Indigenous farmer whose maize crop has failed, with his children.
Early in 2019, a year before the world shut its borders completely, Jorge A. knew he had to get out of Guatemala. The land was turning against him. For five years, it almost never rained. Then it did rain, and Jorge rushed his last seeds into the ground. The corn sprouted into healthy green stalks, and there was hope — until, without warning, the river flooded. Jorge waded chest-deep into his fields searching in vain for cobs he could still eat. Soon he made a last desperate bet, signing away the tin-roof hut where he lived with his wife and three children against a $1,500 advance in okra seed. But after the flood, the rain stopped again, and everything died. Jorge knew then that if he didn’t get out of Guatemala, his family might die, too.

This article, the first in a series on global climate migration, is a partnership between ProPublica and The New York Times Magazine, with support from the Pulitzer Center. Read Part 2 and Part 3, and more about the data project that underlies the reporting.

Even as hundreds of thousands of Guatemalans fled north toward the United States in recent years, in Jorge’s region — a state called Alta Verapaz, where precipitous mountains covered in coffee plantations and dense, dry forest give way to broader gentle valleys — the residents have largely stayed. Now, though, under a relentless confluence of drought, flood, bankruptcy and starvation, they, too, have begun to leave. Almost everyone here experiences some degree of uncertainty about where their next meal will come from. Half the children are chronically hungry,
and many are short for their age, with weak bones and bloated bellies. Their families are all facing the same excruciating decision that confronted Jorge.
ALTA VERAPAZ. An ear of maize from a failed crop.
The odd weather phenomenon that many blame for the suffering here — the drought and sudden storm pattern known as El Niño — is expected to become more frequent as the planet warms. Many semiarid parts of Guatemala will soon be more like a desert. Rainfall is expected to decrease by 60 percent in some parts of the country, and the amount of water replenishing streams and keeping soil moist will drop by as much as 83 percent. Researchers project that by 2070, yields of some staple crops in the state where Jorge lives will decline by nearly a third.

Scientists have learned to project such changes around the world with surprising precision, but — until recently — little has been known about the human consequences of those changes. As their land fails them, hundreds of millions of people from Central America to Sudan to the Mekong Delta will be forced to choose between flight or death. The result will almost certainly be the greatest wave of global migration the world has seen.

In March, Jorge and his 7-year-old son each packed a pair of pants, three T-shirts, underwear and a toothbrush into a single thin black nylon sack with a drawstring. Jorge’s father had pawned his last four goats for $2,000 to help pay for their transit, another loan the family would have to repay at 100 percent interest. The coyote called at 10 p.m. — they would go that night. They had no idea then where they would wind up, or what they would do when they got there.

From decision to departure, it was three days. And then they were gone.
For most of human history, people have lived within a surprisingly narrow range of temperatures, in the places where the climate supported abundant food production. But as the planet warms, that band is suddenly shifting north. According to a pathbreaking recent study in the journal Proceedings of the National Academy of Sciences, the planet could see a greater temperature increase in the next 50 years than it did in the last 6,000 years combined. By 2070, the kind of extremely hot zones, like in the Sahara, that now cover less than 1 percent of the earth’s land surface could cover nearly a fifth of the land, potentially placing one of every three people alive outside the climate niche where humans have thrived for thousands of years. Many will dig in, suffering through heat, hunger and political chaos, but others will be forced to move on. A 2017 study in Science Advances found that by 2100, temperatures could rise to the point that just going outside for a few hours in some places, including parts of India and Eastern China, “will result in death even for the fittest of humans.”

People are already beginning to flee. In Southeast Asia, where increasingly unpredictable monsoon rainfall and drought have made farming more difficult, the World Bank points to more than eight million people who have moved toward the Middle East, Europe and North America. In the African Sahel, millions of rural people have been streaming toward the coasts and the cities amid drought and widespread crop failures. Should the flight away from hot climates reach the scale that current research suggests is likely, it will amount to a vast remapping of the world’s populations.
Migration can bring great opportunity not just to migrants but also to the places they go. As the United States and other parts of the global North face a demographic decline, for instance, an injection of new people into an aging work force could be to everyone’s benefit. But securing these benefits starts with a choice: Northern nations can relieve pressures on the fastest-warming countries by allowing more migrants to move north across their borders, or they can seal themselves off, trapping hundreds of millions of people in places that are increasingly unlivable. The best outcome requires not only good will and the careful management of turbulent political forces; without preparation and planning, the sweeping scale of change could prove wildly destabilizing. The United Nations and others warn that in the worst case, the governments of the nations most affected by climate change could topple as whole regions devolve into war.

The stark policy choices are already becoming apparent. As refugees stream out of the Middle East and North Africa into Europe and from Central America into the United States, an anti-immigrant backlash has propelled nationalist governments into power around the world. The alternative, driven by a better understanding of how and when people will move, is governments that are actively preparing, both materially and politically, for the greater changes to come.
Projected percentage decrease by 2070 in the yield of the rice crop in Alta Verapaz, Guatemala: 32

Last summer, I went to Central America to learn how people like Jorge will respond to changes in their climates. I followed the decisions of people in rural Guatemala and their routes to the region’s biggest cities, then north through Mexico to Texas. I found an astonishing need for food and witnessed the ways competition and poverty among the displaced broke down cultural and moral boundaries. But the picture on the ground is scattered. To better understand the forces and scale of climate migration over a broader area, The New York Times Magazine and ProPublica joined with the Pulitzer Center in an effort to model, for the first time, how people will move across borders.

We focused on changes in Central America and used climate and economic-development data to examine a range of scenarios. Our model projects that migration will rise every year regardless of climate, but that the amount of migration increases substantially as the climate changes. In the most extreme climate scenarios, more than 30 million migrants would head toward the U.S. border over the course of the next 30 years.

Migrants move for many reasons, of course. The model helps us see which migrants are driven primarily by climate, finding that they would make up as much as 5 percent of the total. If governments take modest action to reduce climate emissions, about 680,000 climate migrants might move from Central America and Mexico to the United States between now and 2050. If emissions continue unabated, leading to more extreme
warming, that number jumps to more than a million people. (None of these figures include undocumented immigrants, whose numbers could be twice as high.)

The model shows that the political responses to both climate change and migration can lead to drastically different futures.
As with much modeling work, the point here is not to provide concrete numerical predictions so much as it is to provide glimpses into possible futures. Human movement is notoriously hard to model, and as many climate researchers have noted, it is important not to add a false precision to the political battles that inevitably surround any discussion of migration. But our model
offers something far more potentially valuable to policymakers: a detailed look at the staggering human suffering that will be inflicted if countries shut their doors.

In recent months, the coronavirus pandemic has offered a test run on whether humanity has the capacity to avert a predictable — and predicted — catastrophe. Some countries have fared better. But the United States has failed. The climate crisis will test the developed world again, on a larger scale, with higher stakes. The only way to mitigate the most destabilizing aspects of mass migration is to prepare for it, and preparation demands a sharper imagining of where people are likely to go, and when.

I. A DIFFERENT KIND OF CLIMATE MODEL

In November 2007, Alan B. Krueger, a labor economist known for his statistical work on inequality, walked into the Princeton University offices of Michael Oppenheimer, a leading climate geoscientist, and asked him whether anyone had ever tried to quantify how and where climate change would cause people to move.

Earlier that year, Oppenheimer helped write the U.N. Intergovernmental Panel on Climate Change report that, for the first time, explored in depth how climate disruption might uproot large segments of the global population. But as groundbreaking as the report was — the U.N. was recognized for
II. HOW CLIMATE MOVES PEOPLE

Delmira de Jesús Cortez Barrera moved to the outskirts of San Salvador six years ago, after her life in the rural western edge of El Salvador — just 90 miles from Jorge A.’s village in Guatemala — collapsed. Now she sells pupusas on a block not far from where teenagers stand guard for the Mara Salvatrucha gang. When we met last summer, she was working six days a week, earning $7 a day, or less than $200 a month. She relied on the kindness of her boss, who gave her some free meals at work. But everything else for her and her infant son she had to provide herself. Cortez commuted before dawn from San Marcos, where she lived with her sister in a cheap room off a pedestrian alleyway. But her apartment still cost $65 each month. And she sent $75 home to her parents each month — enough for beans and cheese to feed the two daughters she left with them. “We’re going backward,” she said.

Her story — that of an uneducated, unskilled woman from farm roots who can’t find high-paying work in the city and falls deeper into poverty — is a familiar one, the classic pattern of in-country migration all around the world. San Salvador, meanwhile, has become notorious as one of the most dangerous cities in the world, a capital in which gangs have long controlled everything from the majestic colonial streets of its downtown squares to the offices of the politicians who reside in them. It is against this backdrop of war, violence, hurricanes and poverty that one in six of El Salvador’s citizens have fled for the United States over the course of the last few decades, with some 90,000 Salvadorans apprehended at the U.S. border in 2019 alone.
Cortez was born about a mile from the Guatemalan border, in El Paste, a small town nestled on the side of a volcano. Her family were jornaleros — day laborers who farmed on the big maize and bean plantations in the area — and they rented a two-room mud-walled hut with a dirt floor, raising nine children there. Around 2012, a coffee blight worsened by climate change virtually wiped out El Salvador’s crop, slashing harvests by 70 percent. Then drought and unpredictable storms led to what a U.N.-affiliated food-security organization describes as “a progressive deterioration” of Salvadorans’ livelihoods.

That’s when Cortez decided to leave. She married and found work as a brick maker at a factory in the nearby city of Ahuachapán. But the gangs found easy prey in vulnerable farmers and spread into the Salvadoran countryside and the outlying cities, where they made a living by extorting local shopkeepers. Here we can see how climate change can act as what Defense Department officials sometimes refer to as a “threat multiplier.” For Cortez, the threat could not have been more dire. After two years in Ahuachapán, a gang-connected hit man knocked on Cortez’s door and took her husband, whose ex-girlfriend was a gang member, executing him in broad daylight a block away.

In other times, Cortez might have gone back home. But there was no work in El Paste, and no water. So she sent her children there and went to San Salvador instead.
For all the ways in which human migration is hard to predict, one trend is clear: Around the world, as people run short of food and abandon farms, they gravitate toward cities, which quickly grow overcrowded. It’s in these cities, where waves of new people stretch infrastructure, resources and services to their limits, that migration researchers warn that the most severe strains on society will unfold. Food has to be imported — stretching reliance on already-struggling farms and increasing its cost. People will congregate in slums, with little water or electricity, where they are more vulnerable to flooding or other disasters. The slums fuel extremism and chaos.

It is a shift that is already well underway, which is why the World Bank has raised concerns about the mind-boggling influx of people into East African cities like Addis Ababa, in Ethiopia, where the population has doubled since 2000 and is expected to nearly double again by 2035. In Mexico, the World Bank estimates, as many as 1.7 million people may migrate away from the hottest and driest regions, many of them winding up in Mexico City.

But like so much of the rest of the climate story, the urbanization trend is also just the beginning. Right now a little more than half of the planet’s population lives in urban areas, but by the middle of the century, the World Bank estimates, 67 percent will. In just a decade, four out of every 10 urban residents — two billion people around the world — will live in slums. The International Committee of the Red Cross warns that 96 percent of future urban growth will happen in some of the world’s most fragile cities, which already face a heightened risk of conflict and have governments that are least capable of dealing with it. Some cities will be unable to sustain the influx.
In the case of Addis Ababa, the World Bank suggests that in the second half of the century, many of the people who fled there will be forced to move again, leaving that city as local agriculture around it dries up.

Percentage of El Salvador’s 6.4 million residents who currently lack a reliable source of food: 42

Our modeling effort is premised on the notion that in these cities as they exist now, we can see the seeds of their future growth. Relationships between quality-of-life factors like household income in specific neighborhoods, education levels, employment rates and so forth — and how each of those changed in response to climate — would reveal patterns that could be projected into the future. As moisture raises the grain in a slab of wood, the information just needed to be elicited.

Under every scientific forecast for global climate change, El Salvador gets hotter and drier, and our model was in accord with what other researchers said was likely: San Salvador will continue to grow as a result, putting still more people in its dense outer rings. What happens in its farm country, though, is more dependent on which climate and development policies governments to the north choose to deploy in dealing with the warming planet. High emissions, with few global policy changes and relatively open borders, will drive rural El Salvador — just like rural Guatemala — to empty out, even as its cities grow.
Should the United States and other wealthy countries change the trajectory of global policy, though — by, say, investing in climate mitigation efforts at home but also hardening their borders — they would trigger a complex cascade of repercussions farther south, according to the model. Central American and Mexican cities continue to grow, albeit less quickly, but their overall wealth and development slows drastically, most likely concentrating poverty further. Far more people also remain in the countryside for lack of opportunity, becoming trapped and more desperate than ever.
People move to cities because they can seem like a refuge, offering the facade of order — tall buildings and government presence — and the mirage of wealth. I met several men who left their farm fields seeking extremely dangerous work as security guards in San Salvador and Guatemala City. I met a 10-year-old boy washing car windows at a stoplight, convinced that the coins in his jar would help buy back his parents’ farmland. Cities offer choices, and a sense that you can control your destiny.

These same cities, though, can just as easily become traps, as the challenges that go along with rapid urbanization quickly pile up. Since 2000, San Salvador’s population has ballooned by more than a third as it has absorbed migrants from the rural areas, even as tens of thousands of people continue to leave the country and migrate north. By midcentury, the U.N. estimates that El Salvador — which has 6.4 million people and is the most densely populated country in Central America — will be 86 percent urban.

Our models show that much of the growth will be concentrated in the city’s slumlike suburbs, places like San Marcos, where people live in thousands of ramshackle structures, many without electricity or fresh water. In these places, even before the pandemic and its fallout, good jobs were difficult to find, poverty was deepening and crime was increasing. Domestic abuse has also been rising, and declining sanitary conditions threaten more disease. As society weakens, the gangs — whose members outnumber the police in parts of El Salvador by an estimated three to one — extort and recruit. They have made San Salvador’s murder rate one of the highest in the world.
Cortez hoped to escape the violence, but she couldn’t. The
gangs run through her apartment block, stealing televisions and
collecting protection payments. She had recently witnessed a
murder inside a medical clinic where she was delivering food.
The lack of security, the lack of affordable housing, the lack of
child care, the lack of sustenance — all influence the evolution of
complex urban systems under migratory pressure, and our
model considers such stresses by incorporating data on crime,
governance and health care. They are signposts for what is to
come.

A week before our meeting last year, Cortez had resolved to
make the trip to the United States at almost any cost. For
months she had “felt like going far away,” but moving home was
out of the question. “The climate has changed, and it has
provoked us,” she said, adding that it had scarcely rained in
three years. “My dad, last year, he just gave up.”

Cortez recounted what she did next. As her boss dropped
potato pupusas into the smoking fryer, Cortez turned to her and
made an unimaginable request: Would she take Cortez’s baby? It
was the only way to save the child, Cortez said. She promised to
send money from the United States, but the older woman said
no — she couldn’t imagine being able to care for the infant.

Today San Salvador is shut down by the coronavirus pandemic,
and Cortez is cooped up inside her apartment in San Marcos.
She hasn’t worked in three months and is unable to see her
daughters in El Pastel. She was allowed a forbearance on rent
during the country’s official lockdown, but that has come to an end. She remains convinced that the United States is her only salvation — border walls be damned. She’ll leave, she said, “the first chance I get.”
Most would-be migrants don’t want to move away from home. Instead, they’ll make incremental adjustments to minimize change, first moving to a larger town or a city. It’s only when those places fail them that they tend to cross borders, taking on ever riskier journeys, in what researchers call “stepwise migration.” Leaving a village for the city is hard enough, but crossing into a foreign land — vulnerable to both its politics and its own social turmoil — is an entirely different trial.

Seven miles from the Suchiate River, which marks Guatemala’s border with Mexico, sits Siglo XXI, one of Mexico’s largest immigration detention centers, a squat concrete compound with 30-foot walls, barred windows and a punishment cell. In early 2019, the 960-bed facility was largely empty, as Mexico welcomed passing migrants instead of detaining them. But by March, as the United States increased pressure to stop Central Americans from reaching its borders, Mexico had begun to detain migrants who crossed into its territory, packing almost 2,000 people inside this center near the city of Tapachula. Detainees slept on mattresses thrown down in the white-tiled hallways, waited in lines to use toilets overflowing with feces and crammed shoulder to shoulder for hours to get a meal of canned meat spooned onto a metal tray.

Projected decrease in percentage of annual rainfall by 2070 in many parts of Guatemala: 60

On April 25, imprisoned migrants stormed the stairway leading to a fortified security platform in the center’s main hall, overpowering the guards and then unlocking the main gates.
More than 1,000 Guatemalans, Cubans, Salvadorans, Haitians and others streamed into the Tapachula night.

I arrived in Tapachula five weeks after the breakout to find a city cracking in the crucible of migration. Just months earlier, passing migrants on Mexico’s southern border were offered rides and tortas and medicine from a sympathetic Mexican public. Now migrant families were being hunted down in the countryside by armed national-guard units, as if they were enemy soldiers.

Mexico has not always welcomed migrants, but President Andrés Manuel López Obrador was trying to make his country a model for increasingly open borders. This idealistic effort was also pragmatic: It was meant to show the world an alternative to the belligerent wall-building xenophobia he saw gathering momentum in the United States. More open borders, combined with strategic foreign aid and help with human rights to keep Central American migrants from leaving their homes in the first place, would lead to a better outcome for all nations. “I want to tell them they can count on us,” López Obrador had declared, promising the migrants work permits and temporary jobs.

The architects of Mexico’s policies assumed that its citizens had the patience and the capacity to absorb — economically, environmentally and socially — such an influx of people. But they failed to anticipate how President Trump would hold their economy hostage to press his own anti-immigrant crackdown, and they were caught off-guard by how the burdens brought by the immigration traffic weighed on Mexico’s own people.
In the six months after López Obrador took office in December 2018, some 420,000 people entered Mexico without documentation, according to Mexico’s National Migration Institute. Many floated across the Suchiate on boards tied atop large inner tubes, paying guides a couple of dollars for passage. In Ciudad Hidalgo, a border town outside Tapachula, migrants camped in the square and fought in the streets. In a late-night interview in his cinder-block office, under the glare of fluorescent lights, the town’s director of public security, Luis Martínez López, rattled off statistics about their impact: Armed robberies jumped 45 percent; murders increased 15 percent.

Whether the crimes were truly attributable to the migrants was a matter of significant debate, but the perception that they were fueled a rising impatience. That March, Martínez told me, a confrontation between a crowd of about 400 migrants and the local police turned rowdy, and the migrants tied up five officers in the center of town. No one was hurt, but the incident stoked locals’ concern that things were getting out of control. “We used to open doors for them like brothers and feed them,” said Martínez, who has since left his government job. “I was disappointed and angry.”

In Tapachula, a much larger city, tourism and commerce began to suffer. Whole families of migrants huddled in downtown doorways overnight, crowding sidewalks and sleeping on thin, oil-stained sheets of cardboard. Hotels — normally almost sold out in December — were less than 65 percent full as visitors stayed away, fearful of crime. Clinics ran short of medication. The impact came at a vulnerable moment: While many northern Mexican states enjoyed economic growth of 3 to 11 percent in 2018, Chiapas — its southernmost state — had a 3 percent drop
in its gross domestic product. “They are overwhelmed,” said the Rev. César Cañaveral Pérez, who earned a Ph.D. in the theology of human mobility in Rome and now runs Tapachula’s largest Catholic migrant shelter.