

How to Be Human
in a Warming World

Under
the Sky
We
Make

KIMBERLY NICHOLAS, PHD

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in a Warming World



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G. P. Putnam's Sons
New York

PUTNAM

— EST. 1838 —

G. P. Putnam's Sons

Publishers Since 1838

An imprint of Penguin Random House LLC

penguinrandomhouse.com



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LIBRARY OF CONGRESS CATALOGING-IN-PUBLICATION DATA
has been applied for.

ISBN 9780593328170 (hardcover)

ISBN 9780593328187 (ebook)

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Cover design: Monica Cordova

Cover image: Marukopum / Shutterstock

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To 2030. I hope we did right by you.

Contents

[Introduction: Science Won't Save Us](#)

[Part I: It's Warming. It's Us.](#)

[Chapter 1: Carbon Is Forever](#)

[Chapter 2: We're the Asteroid](#)

[Chapter 3: Uprooting Exploitation, Sowing Regeneration](#)

[Part II: We're Sure. It's Bad.](#)

[Chapter 4: Sink into Your Grief](#)

[Chapter 5: Making Meaning in a Warming World](#)

[Chapter 6: Face Your Fears](#)

[Chapter 7: Get Angry.](#)

[Part III: We Can Fix It.](#)

[Chapter 8: Climate Change Isn't Fair](#)

[Chapter 9: Slowing Down and Staying Grounded](#)

[Chapter 10: Food Shouldn't Come from a Factory.](#)

[Chapter 11: Values and Costs](#)

[Chapter 12: The Personal Is Political](#)

[Chapter 13: Being a Good Ancestor](#)

[Conclusion: Under the Sky We Make](#)

[TLDR \(Too Long, Didn't Read\)](#)

[Acknowledgments](#)

[Notes](#)

[Index](#)

Introduction

Science Won't Save Us

In the half lifetime since we met in college, I've had many adventures with my friend Colty. Together we've seen the sun rise through towering pines after dancing all night on the shores of Fallen Leaf Lake; buoyed each other through heartbreak and celebrated when we both found true love; sobbed through a funeral where our tears loosened the glue of the fake mustaches we wore to honor our dead friend's iconoclastic spirit.

Colty and I have always been able to talk about anything and everything, but I was surprised by the conversation we had a few years ago, when I called to congratulate him on the birth of his second child. I was expecting to hear intimate stories of adjusting to new family routines, but his daughter's arrival had raised Colty's sights much higher.

"Kimmy, I want to talk about climate change," he said. "I feel like all these red flags are going up around me, saying, 'Wake up!' But I'm overwhelmed. Where do I start?"

For decades, I've spent my professional life researching, teaching, and communicating about climate change. But until recently, my climate work hasn't been something I talked about with my closest friends. For my research, I spent long, sweaty days of fieldwork in the mountains and grasslands and vineyards of California, documenting sagebrush marching uphill and Pinot Noir grapes around my hometown of Sonoma losing their color as the world warmed around them. All this felt like a separate world from the time I spent with my friends, where we talked and joked about our families, careers, and love lives; went for hikes through the redwoods and to the beach; and shared good meals and wine.

Through my years of avoiding talking about the climate elephant in the room, I was like most Americans, who know climate change is happening and are worried about it. (Only 10 percent don't believe the unequivocal fact that humans are warming the climate.) But still, unlike the vocal climate dismissives, most of the climate-concerned majority stays silent, reporting they almost never talk about climate change with friends and family. Many feel like it's someone else's problem: polar bears, perhaps, or politicians, or people unlucky enough to be born somewhere poorer or sometime later than they were.

Once you do start talking about it, you can't avoid scientific truths with overwhelming, existential implications. Human climate pollution and destruction of nature are putting at risk both human civilization and life on Earth as we know it. Gulp. In the face of this enormity, no wonder so many feel helpless (that you're powerless and don't matter) and hopeless (that no one can help and therefore nothing matters). I understand those feelings. I have them myself.

Over the course of my career, climate change has transmogrified from something only experts could see—reading clues trapped in icy air bubbles or statistical patterns in long-term data sets—to something everyone on Earth is living through. For me, climate change has gone from being something I study to a way that I see the world and experience my life. It's one thing to publish a study on the hypothetical impacts of temperature increase on California's people and ecosystems; it's another to feel my stomach gripped by fear as my parents flee a catastrophic California wildfire cranked up by longer, hotter, drier summers. It's one thing to measure declining color pigments in Pinot Noir grapes due to increasing temperatures; it's another to viscerally mourn the loss of the taste of my favorite wine as it passes from this Earth.

By the time Colty and I finally talked about climate, it had gone from a measurable change to a prevailing crisis to a screaming emergency. Climate change was already rewriting the stories we read, reshaping our everyday lives, affecting everything and everyone we love. Climate was already woven through everything else we talked and cared about.

Colty and I had a series of climate counseling sessions, where we talked about the core values he hoped to pass on to his kids, his hopes and fears for the future, what inspired him and kept him

going. In our conversations, I translated the science of an enormous global problem to a personal and human scale. I wanted to help my friend see the power he *already* had to be a force for climate and social good and to live a better life more in line with his values along the way.

These sessions were a version of the conversation I've been having over and over again, for years—with strangers at parties and on trains, in my talks with business leaders, festivalgoers, protesters, knitting grandmas, and everyone else who will listen. From these conversations, I know firsthand that there are many smart, concerned people out there who are deeply invested in the future of humankind and who don't need further proof that climate change is a real and urgent threat. Those of us who want to help are the majority; if even a fraction of us can mobilize and take action, we are more than enough to stabilize the climate.

That's why I'm writing this book.

Science Won't Save Us

Here's some good news for everyone who's been avoiding science since you had to memorize the periodic table in high school: We don't really need more science to solve the climate crisis. Saving the planet for humanity (and the rest of nature) is no longer a matter of understanding anything we don't, or developing a ton of technology we haven't. Science has carried our collective knowledge about as far as it can in the time we have. Luckily, it's enough.

The science of climate change is firmly settled, and has been for a very long time. It boils down to just five key facts, which I've been teaching since 2011: It's warming. It's us. We're sure. It's bad. But! We can fix it: Humans have the capacity to stop dangerously destabilizing the climate.

Basically, the climate problem has been solved on paper many times over by now. We know what we have to do and how to do it. Further tech breakthroughs could make it even faster and cheaper, but essentially we have the tech we need in hand.

Okay, then fixing climate change is a political problem, right? Well, yes and no. Changes in goals, policies, and laws are crucial.

And you need to understand some power politics to get why humans find ourselves threatening to unplug our own life-support system in the first place. But the basic political framework to solve the climate crisis is also in place. To paraphrase three decades of negotiation-speak: The world has agreed that stopping climate warming is in the shared interest of humanity. The 2015 Paris Agreement says each and every country (and therefore, each and every industry and city, and ultimately each person) must do their fair share to stop climate heating before it exceeds intolerable limits. That bounces the ball right back to us.

So yes, we need technical and social transformations, informed by science, to be put into practice to solve the climate crisis. We need political processes to do this fairly, citizens informed by fact-based climate education at all levels, and media coverage that explains how climate shapes nearly every story. Preferably all at once.

But what will really make or break the climate, globally and forever, is what ordinary people do in the next decade. The climate hinges on what people vote for, with our ballots and time and money and careers, with our leisure and travel and consumption and production, with our relationships and conversations and aspirations and memes and everything else that adds up to culture.

Science or experts or technology isn't enough to save us from climate catastrophe. We as humanity, a groundswell of people alive today around the world, have to save ourselves, through what we think and feel and ultimately what we do. This means we need people with the courage and compassion and imagination to transform themselves, and society, in the ways that science tells us are necessary to maintain conditions for life on Earth to be able to thrive. Each of us can become that sort of person; more and more are every day.

The climate especially hangs on what Americans do in the next decade. In 2010 I moved from California to Sweden, where I'm a professor of sustainability science at Lund University. Looking at the United States from abroad, it's acutely clear how much the climate hinges on what happens in the world's largest economy and largest historical climate polluter (USA! We're number one!). For practical reasons, Americans starting to take climate responsibility at scale would be an enormously powerful accelerator of climate action worldwide.

But there's a deeper cultural element too: For generations, the world has aspired to an American model of consumption that is widening inequality, making us sick and unhappy, and destroying the workings and wonders of the natural world. Americans need to reinvent our dream toward one worth striving for and spreading: a good life for *all*, within a budget the planet and future generations can afford.

That means the climate *really* needs people like me and Colty to step up, because our privilege translates into disproportionate power and responsibility in many realms—and the climate is no exception. With our incomes in the top 10 percent globally, we're part of the group that consumes the majority of the world's resources and therefore creates most of the world's problems when it comes to heating the climate and destroying nature. (If your income is more than \$38,000 per year, you're in the top 10 percent of the global income camp too.) Those of us with even more climate privilege, who are higher up the income ladder, are having an even more outsized impact. We need to take a long, hard look at our climate legacy—in terms of both our personal lifestyles and the political, economic, and cultural systems we help create, support, and empower—to see if it's really the mark we want to leave on the world.

It's Us

This book is a guide to how to live through what I think is the most riveting, challenging, terrifying, important, and meaningful time to be alive. The most essential lesson I take away from the thousands of scientific studies I've read, and the fifty-plus I've written, is that people alive right now are living through the decade that will define the future for both humanity and life on Earth. We are setting the global thermostat and therefore the boundaries and possibilities for human development, as well as the living conditions for all life on this planet, for the rest of our lives . . . and affecting millennia to come.

The goal is for humanity as a whole, and I hope you and me personally, to get through the warming decades ahead together; to live to see a time where the climate is stabilizing, nature is

recovering, human well-being is flourishing, and equality is increasing. To get there, we will have to draw on the best of ourselves and bring out the best in one another.

How can we stop climate breakdown in time to protect the only home we have, which we share with almost 8 billion fellow humans and about 8 million other species? In my opinion, we need to put the human values we hold most dear at the core of this work, because ultimately preserving the legacy of these human values is what is at stake. Nothing short of transformative change is going to be enough.

As you may have guessed by now, this is a different kind of climate book, one that's not only about the science.

Sure, I draw from my expertise as a scientist, with a reverence for evidence (hence all those endnotes) and analytical rigor. But my mission is to use this science to draw lessons about how to be human in our warming world. I aim to give the science a human face, by sharing stories from my own journey and from people who inspire me. By sharing these stories, I am acknowledging something that was initially hard for this scientist to admit: It is not just facts that we need to solve climate change; it is also tapping into the strength of our feelings about what we most fear, grieve, and love. It is the people and places and things I love—relationships, family folklore, beloved landscapes, wine—that motivate and sustain my work. Only by looking at climate change as humans, bringing all our humanity and empathy to bear, can we start to head toward the solutions at the speed and the scale needed.

Breaking Up with Exploitation

As a nerd steeped in sophisticated analyses, when I look for the root cause of humanity's current woes, I'm embarrassed by the naivety of my diagnosis. But here it is anyway:

Right now, too many people have a mindset of exploitation of nature and other people. This Exploitation Mindset is not fact. It's not based on any fundamental truths about nature or human nature. Instead, it's a story we're telling ourselves about who we are and the way we live in middle-class, industrialized societies, until it's become as invisible and taken for granted as the air we breathe.

This story is changeable, even though it feels like it isn't. There's a better way to live. We must find it.

Our task as humans in this warming decade and beyond is taking the science and using it as a lens to change not just our systems but also ourselves, from the inside out. By clarifying our values and shifting our mindsets and actions, we can start to change the world.

We need a new mindset to have a good future for life on Earth. We can and must change the story of exploitation, by identifying all the ways this mindset is baked into our current society, eradicating it, and replacing it with a better one.

My suggestion for a better story is what I call the Regeneration Mindset, which is focused on working *with* rather than *against* nature and bringing out the best of ourselves and one another. I've boiled down the Regeneration Mindset to three ideas that could be embroidered on your grandma's throw pillow or pasted in construction paper on your kindergartener's classroom wall: Respect life. Stop harming life. Strengthen life. Sounds pretty basic, but as I hope to illustrate in this book, I think these principles are flexible enough to guide action across diverse circumstances. Actually putting them into practice would be profoundly transformative.

The Path Ahead

This book is structured in three parts, which roughly correspond to the brain, the heart, and the hands, or thinking, feeling, and doing. In general, the book progresses from diagnosing problems to offering solutions, and from the global and abstract to the personal and tangible.

In Part 1, I tell stories of my family history and the history of life on Earth, to illustrate how humans and nature are tied up together (it's warming; it's us) and show the legacy humans are leaving in the sky and across the living world. I tell these stories because I believe understanding the science—truly understanding what the workings of the material world we share mean for humanity and our civilization, and how acute our predicament is right now—offers a kind of awakening. I hope coming to terms with the sobering power humankind wields at this moment helps us converge on the urgent

need to lay down the weapons of the Exploitation Mindset and pick up the tools of Regeneration instead. The point of Part 1 is to empower you to orient your goals by asking the questions and having the conversations about how your everyday life and everything you love are inextricably connected to the climate and the living world, which are under urgent threat.

Well, *that* was all a bit heavy, now, wasn't it?! If Part 1 is about facts, Part 2 is about feelings, drawn from my own journey of slowly learning to acknowledge all the uncomfortable emotions of being a climate expert with a brain, and a human being with a heart, in a warming world. I share what losing a dear friend to cancer taught me about grieving climate losses (it's bad), how facing my climate fears with my community gives me strength to carry on, and my enraging experiences of being a scientist in a world that sometimes doesn't want to hear the truth (we're sure). To see a pathway out of our climate and ecological crises, I had to stop looking to science for all the answers and start changing myself, using the climate crisis as a crucible to create meaning by clarifying my values and putting them into practice. The goal of Part 2 is to help you find your climate calling: to identify and nurture what really matters to you and to cultivate and strengthen the personal and community resilience essential to make your way in this warming world with kindness and purpose.

After we've made it through All the Climate Feels in Part 2, we're ready to roll up our sleeves and get to work. Part 3 is all about how We Can Fix It: envisioning and creating a future we want through both personal and system change. Here's where "climate action" goes from a hollow hashtag to concrete steps for who can do what to zero out climate pollution while strengthening people and nature. This part is about putting the Regeneration Mindset into practice within the day-to-day life you already lead, and how it scales to policies. It's also about expanding your vision of your sphere of power, to help extend the reach of what humans make possible. In line with my focus on what matters most, I emphasize what research and my personal experience show are the most effective ways to spend your limited time and energy for maximum impact. The goal of Part 3 is to help you find ways to use your unique gifts with agency, urgency, and joy to start bending our story from a legacy of harm to one of care.

Simply put: This is a climate scientist's book about the apocalyptic urgency of prioritizing not just the planet but also our humanity. I want to tell the story of our Earth's past, our world's present, and humankind's future—under the sky we make.

Part I
It's Warming. It's Us.
How We Got Here

Chapter 1

Carbon Is Forever

Understanding the Urgency of the Task Ahead

My mother's mother's mother, Clara, fled what is now Ukraine in 1904, when she was twenty-two. She had sewn her filigreed platinum engagement ring into her jacket to avoid detection as a deserter. If the authorities caught you leaving with your husband, they knew you were escaping for good. Her immigration record from Ellis Island lists her port of departure as Bremen. She and her husband, my great-grandfather Mark, lived in a damp tenement near Coney Island before they eventually settled in Denver, where they ran a women's clothing shop and raised my grandmother Lillian and her brother.

I've seen only one photograph of Mark, wearing a fedora, and Clara, with dark wavy hair. It was taken on a suburban Denver street with my mother, a serious five-year-old, and her sister Judy, already a great beauty at nine: old-world grandparents who loved borscht, posing with their wholly American grandchildren who thought the smell of beets and cabbage cooking was just awful. Clara made her life in a new country in her twenties, as I did in my thirties when I crossed the ocean to live in Sweden.

I never met Clara, but she touches my daily life in two ways. First, her diamond sparkles on my left ring finger. Second, carbon from the coal that powered her escape, across first a continent and then an ocean, is still warming the atmosphere I share today with nearly 8 billion people. Because when your individual actions are powered by fossil fuels, some of the carbon from those actions stays in the air for thousands of years. Your story doesn't end with your death; its contrails unfurl in the physical world for millennia.

Clara lived to be eighty-two—a good, long life. Her grandchildren—my mother and her two siblings—are the last generation of my family to have known her. They’re now grandparents themselves. Once they’re gone, living memory of Clara will wane and eventually the stories they shared of her will disappear too. Clara’s life, as real and as vivid and important as mine or anyone else’s, will fade into the background of the human tapestry. But her carbon will outlast us all.

I don’t know the name of Clara’s mother’s mother’s mother. She would have been born in black-soil country sometime around 1800, so I can guess that she was part of a big family, all of whom worked hard on the farm. I like to imagine them playing music around the fire at night. But here’s one thing I know for sure: A portion of the carbon sent skyward from the wood they burned to stay warm—and the carbon they released plowing the rich black soil—is still in our air today, and it will be for at least the next *three hundred* generations.

I don’t know what Clara was thinking when she decided to risk the perilous journey to a new land and leave behind everything she knew. I don’t know how much thought she gave to her potential descendants and the life they would have as a result of her choice, or how much she was motivated by her own more immediate desires. Nevertheless, she set in motion a chain of events that shaped my life, giving me more choices, more freedoms, more privilege. I’m deeply grateful to her as a good ancestor.

Everyone alive today is skywriting the most important legacy of their lives in atmospheric carbon. Long after our names and faces and deeds have faded from living memory, long after any genetic or creative or physical or digital traces of us are gone, this carbon legacy will define us in the minds and stories of our distant descendants. It will literally define the terms of their lives: where they can live, how they can make a living, what kind of civilization and nature surround them. We will be remembered for our carbon legacy by far more people than we’ll ever share a meal with or know by name.

Carbon Is Forever