

A PEOPLE'S CURRICULUM FOR THE EARTH

EDITED BY BILL BIGELOW & TIM SWINEHART



A RETHINKING SCHOOLS PUBLICATION

A PEOPLE'S CURRICULUM FOR THE EARTH

**TEACHING CLIMATE CHANGE
AND THE ENVIRONMENTAL CRISIS**

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CLIMATE JUSTICE SEED PACKAGE PREVIEW

A People's Curriculum for the Earth:
Teaching Climate Change and the Environmental Crisis

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A Rethinking Schools Publication

Rethinking Schools Ltd. is a nonprofit publisher and advocacy organization dedicated to sustaining and strengthening public education through social justice teaching and education activism. Our magazine, books, and other resources promote equity and racial justice in the classroom. We encourage grassroots efforts in our schools and communities to enhance the learning and well-being of our children, and to build broad democratic movements for social and environmental justice.

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Thanks, too, to Rethinking Schools editorial associate Adam Sanchez, teacher at Madison High School in Portland, who invited Bill to co-teach a unit on climate change. Some of the curriculum included here was first tested in Adam’s classes. Similarly, at Portland’s Lincoln High School, where Tim teaches, we worked with Chris Buehler, Julie Treick O’Neill, and Matt Plies on the La Vía Campesina role play and other curriculum included here.

Many of the articles in the book first appeared in *Rethinking Schools* magazine. Rethinking Schools has a rigorous editorial process and articles are improved by the work of this collective, whose membership has included Wayne Au, Terry Burant, Linda Christensen, Kelley Dawson Salas, Grace Cornell Gonzales, Jesse Hagopian, Stan Karp, David Levine, Fred McKissack, Larry Miller, Hyung Nam, Bob Peterson, Adam Sanchez, Jody Sokolower, Melissa Bollow Tempel, Stephanie Walters, Dyan Watson, Kathy Xiong, and Moé Yonamine. Managing editor Jody Sokolower’s editorial handiwork improved many of these articles as they made their way first into the pages of *Rethinking Schools*. Bill’s colleagues at the Zinn Education Project—Deborah Menkart, Lauren Cooper, Bill Holtzman, Alison Kysia, and Katy Swalwell—offer ongoing wisdom and humor, and help this work connect with new audiences through the Zinn Education Project’s growing reach.

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We were thrilled when Catherine Capellaro agreed to step in as production editor in the fall of 2013. Catherine is a former *Rethinking Schools* managing editor, a wonderful writer, and one of the most creative people we know. Catherine guided the project to completion with a sharp editorial and artistic eye, along with kindness and good humor.

Nancy Zucker, our brilliant art director at *Rethinking Schools*, worked late nights on this book while dealing with acts of nature and balancing work on the magazine. We are immensely grateful for Nancy's warmth, patience, and fine visual sensibility.

The artist Ricardo Levins Morales, who we've admired for years, designed the book's cover. We urge everyone to check out Ricardo's extraordinary work.

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Finally, Bill writes:

I want to thank my wife and partner in life, Linda Christensen. For 30 years, Linda has shown me what it means to teach for joy and justice. Her vision of teaching and learning finds its way into everything I write. For my part, this book is built on our hikes in Point Reyes, Sedona, the Columbia River Gorge, and in Portland's Forest Park; our conversations about the world and the classroom; and our love for one another, our daughters Anna and Gretchen Hereford, and our grandson Xavier King Hertel. For us, Xavier gives the future a face, a name, and an urgency.

Tim writes:

I'd like to thank Bill for inviting me to work with him on this project. His vision of teaching for justice and a better, more equitable

world will always be the standard for which I strive. Working together on this book has given me the education of a lifetime, as well as a good friend.

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ABOUT THE EDITORS

Bill Bigelow began teaching high school social studies in Portland, Oregon, in 1978, and taught for almost 30 years. He now works as the curriculum editor for *Rethinking Schools* magazine and is co-director of the Zinn Education Project. He has authored or co-edited numerous books on teaching, including *Strangers in Their Own Country: A Curriculum on South Africa* (Africa World Press), *The Power in Our Hands: A Curriculum on the History of Work and Workers in the United States* (Monthly Review Press), *Rethinking Columbus*, *Rethinking Our Classrooms, Vols. 1 and 2*, *Rethinking Globalization: Teaching for Justice in an Unjust World*, *The Line Between Us: Teaching About the Border and Mexican Immigration*, and *A People's History for the Classroom* (all published by Rethinking Schools). He lives in Portland with his wife, Linda Christensen. 🌐

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INTRODUCTION

It's hard to say where the idea for this book originated. It may have been in 2007 when we looked at *Modern World History*, the new global studies textbook our school district, in Portland, Oregon, purchased. The book began one of its three miserable paragraphs on the climate crisis with the statement "Not all scientists agree with the theory of the greenhouse effect." And it was buried on page 679. This was the best that Portland could offer its high school students? (This widely adopted book, published by Holt McDougal, still anchors the official curriculum for Portland high school students' sole class on today's world.)

Or this book's origins may have been at an excellent teach-in sponsored by the International Forum on Globalization in Washington, D.C., that same year, called "Confronting the Triple Crisis," about climate change, the end of cheap energy, and resource depletion and extinction. A number of the contributors to this book presented at this extraordinary gathering: Vandana Shiva, Frances Moore Lappé, Bill McKibben, Michael Klare, and Jeff Goodell. We came away from that weekend convinced of the enormity of the crisis, but we also understood how each supposedly distinct crisis linked to all the others, and then tied back to the fundamental problem of a global economy driven by the quest for profit. The teach-in was our introduction to Annie Leonard's short film *The Story of Stuff*, which captures many of these connections with humor and common sense.

The decision to launch this book—and how we imagined it—was no doubt heavily influenced by the powerful and interconnected analyses offered by the speakers at this teach-in. But we were dismayed that there was no discussion about what this all meant for K–12 education. How should environmental justice movements partner with the educators who work daily with the millions of young people learning their ecological ABCs—or, perhaps too often, not learning them? Implicitly, the conference suggested that this was knowledge to be shared among adults.

We left inspired and informed, but weighed down by the immense burden of figuring out how to "story" the environmental crisis through curriculum.

Back home in Portland we initiated what we called an "Earth in Crisis" curriculum group, and invited colleagues to discuss and test out teaching ideas with one another. This collective nurtured many of the activities included in this book, and also identified key themes that weave through the book. One of these is that **our curriculum must confront the false dichotomy between the environment and people**. It's a theme that Van Jones addresses directly in his TED Talk on "Plastics and Poverty," included in Chapter One (p. 4). Jones points out that people were rightly concerned about the damage to living systems in the Gulf of Mexico caused by the BP oil spill. But he notes that we often do not seem as concerned when that oil gets to where it is "supposed" to go: for example, to petrochemical plants that dot Cancer Alley between Baton Rouge and New Orleans, where it then poisons the largely poor and African American people who live there. Yes, the "environment" is about polar bears, dolphins, redwood forests, and bees; but it is also about human beings—workers, consumers, families, and community members. We call this book a *people's* curriculum for the Earth because we try to keep the focus on the inextricable link between nature and people.

And this suggests another theme that emerged in our Earth in Crisis curriculum work in Portland: **Everyone on Earth is affected by the environmental crisis, but we are affected unequally—based on race, class, nationality, or location**. This is mad-

Yes, the "environment" is about polar bears, dolphins, redwood forests, and bees; but it is also about human beings—workers, consumers, families, and community members.

“Is This Book Biased?”

When Rethinking Schools published *Rethinking Globalization: Teaching for Justice in an Unjust World* in 2002, we asked the question: “Is this book biased?” We answered by quoting the great historian and activist Howard Zinn: “In a world where justice is maldistributed there is no such thing as a neutral or representative recapitulation of the facts.”

Similarly, we cannot be neutral about the environmental crisis. As articles in this volume point out, to prevent the climate from heating up more than two degrees Celsius (3.6 degrees Fahrenheit), about 80 percent of coal, oil, and gas reserves need to stay in the ground. That’s not our opinion. That’s the science. (And even this internationally agreed-upon goal dooms species to extinction and island nations to oblivion.) But energy companies have no intention of “stranding” some \$20 trillion of assets. They plan to endlessly blast and scrape and dig and drill. The possibility of a habitable Earth is fundamentally incompatible with the business plan of the fossil fuel industry.

So, yes, this book takes sides. As the book’s title announces, the curricular materials we provide here are *for* the Earth. We advocate not so much teaching *about* fossil fuels as teaching *against* fossil fuels—and against a system that privatizes decisions on which the future depends.

We are partisan in favor of communities in Kentucky and West Virginia whose health is compromised by the coal industry’s mountaintop removal. We are partisan in favor of Indigenous communities around the globe who have so often found themselves victimized by “development.” And we are partisan in favor of our own children and grandchildren, who we hope can live in a world that doesn’t poison them when they drink the water, breathe the air, or make a living.

In compiling the materials in *A People’s Curriculum for the Earth* we did not seek to provide “equal time” to free market proponents whose policy agen-

da promises more environmental degradation. These perspectives are widely disseminated by the mainstream media—including the textbooks produced by huge corporations. Ours is not a point-counterpoint curriculum that aims to appear “balanced.” But nor do we advocate shielding students from perspectives at odds with ours. To the contrary. We believe it’s important for students to encounter and wrestle with multiple viewpoints, especially those that advocate business as usual.

We believe there’s an important difference between being partisan and being biased. A bias means being unwilling to examine or express one’s own premises. And that’s exactly what we find in mainstream textbooks: a failure to ask students to consider root causes and to ask critical questions about the ideologies and economic forces that led us to our current predicament.

Partisan teaching takes sides on behalf of the Earth. To paraphrase *Rethinking Globalization*, partisan teaching alerts students to social and environmental injustice, seeks explanations, and encourages activism.

Our collective house is on fire; it’s not “biased” to want to put it out. 🌍

deningly evident with the impact of climate change. Throughout the book we feature stories about individuals, and communities—Matthew Gilbert and the Gwich'in (p. 74), Enele Sopoaga in Tuvalu (p. 96), Anisur Rahman of Antartara, Bangladesh (p. 98), the Aymara people of Bolivia (p. 137), the Yup'ik teenagers of Kwigillingok, Alaska (p. 143), and too many others to list, whose carbon footprint is virtually nonexistent and yet who are among the first to suffer from its ravages. Similar issues of race and class are at play when it comes to exposure to workplace pollutants ("Combating Nail Salon Toxics," p. 280), lead poisoning of children in urban areas ("Teaching About Toxins," p. 283), or the pollution from mostly foreign-owned manufacturing plants that blankets poor communities around the world with deadly consequences ("Reading Chilpancingo," p. 288).

This is not to say that people are not organizing in response to this toxic trespass, in the expression of ecologist Sandra Steingraber. They are. And some of them are featured in these pages: the Milwaukee students who blew the whistle on oil contamination in their neighborhood (p. 67), Maria Gunnoe's passionate anti-mountaintop removal activism with communities in West Virginia (p. 210), the Indigenous people described in Winona LaDuke's "Uranium Mining, Native Resistance, and the Greener Path" (p. 321)—"resilient in the face of a deep history of genocide and destruction." But there is a fundamental inequality at the heart of the environmental crisis—one that is central to the articles and teaching activities included in this book.

Shorter Showers?

In our Earth in Crisis group, teachers kept returning to our students' responses: They wanted to know what they could do personally. Early in our work, we concluded that **we need to help students recognize the inadequacy of responding to the environmental crisis solely as individuals**. As we mention in the teaching ideas for Chapter Three, "Facing Climate Chaos" (p. 174), there are entire books that urge students to consider their *individual* carbon footprints, suggesting that our personal patterns of consumption are a root cause of global warming. Students are urged to think about the frequency of their baths, their electricity use, the stuff they buy. Yes, of course, we want young people—and everyone—to be mind-

ful of the Earth as we go through our daily lives. And we want students to recognize the power they have—collectively or individually—to make the world a better place. But it's wrong to direct students primarily toward individual solutions to create change.

In his Chapter Five essay, "Forget Shorter Showers," Derrick Jensen confronts this problematic celebration of individual action:

Consumer culture and the capitalist mindset have taught us to substitute acts of personal consumption (or enlightenment) for organized political resistance. Al Gore's film *An Inconvenient Truth* helped raise consciousness about global warming. But did you notice that all of the solutions presented had to do with personal consumption—changing lightbulbs, inflating tires, driving half as much—and had nothing to do with shifting power away from corporations, or stopping the growth economy that is destroying the planet?

As students' awareness of the environmental crisis grows, this consciousness can be misdirected by social forces that have an interest in how young people respond. The energy industry would much prefer that our students change their lightbulbs, recycle their soda cans, or even install solar panels than organize a demonstration at the state capitol to shut a coal-fired power plant, testify at a public hearing against fracking, or otherwise gum up their fossil fuel machinery.

And there is another way that this celebration of the individual needs to be questioned in a people's curriculum for the Earth. Individual property "rights" have long been seen as synonymous with "liberty." "Liberty! Property!" was a cry of the American Revolution. But there were other more democratic cries as well, like Benjamin Franklin's famous assertion that "Private Property... is a Creature of Society, and is subject to the Calls of that Society, whenever its Necessities shall require it, even to its last Farthing."

There is a fundamental inequality at the heart of the environmental crisis—one that is central to the articles and teaching activities included in this book.

What happens to the Earth if we respect the “right” of the fossil fuel industry to manage their assets however they please? More and more, the headlines are filled with the answer to that question: superstorms, drought, heat waves, melting glaciers, ocean acidification, species extinction, floods, drowning islands. A curriculum on the climate, and the environmental crisis more broadly, needs to address patterns of ownership and decision-making. **Our curriculum needs to confront the myth that private property is, in fact, private.** The fate of the Earth “belongs” to us all.

Capitalism

Helping students acquire a critical consciousness about the environmental crisis means we need to consistently encourage them to ask “Why?” Why is it that the future of life on Earth has been put at risk? It seems an impossible question to answer unless we **engage students in thinking about the nature of global capitalism.** Throughout the book, we draw students’ attention to this broader systemic context within which the environmental crisis is unfolding. Activities like “The Thingamabob Game” (p. 147) and the trial role play “Who’s to Blame for the Climate Crisis?” (p. 163) explicitly confront students with the fundamental clash between an economic system that prizes wealth accumulation above all else and people’s need for a healthy environment. Capitalism insists that key productive decisions be made on the basis of what will yield the greatest profit. It grants godlike powers to unelected elites whose livelihoods depend not on creating a world of equality and environmental sustainability, but on making the most money. If we’re going to help our students not just describe, but explain, the environmental crisis, it is essential that educators name this elephant in our classrooms.

Joy amid Crisis

As this book heads to the printer, the Intergovernmental Panel on Climate Change (IPCC) is about to release what news outlets indicate is its most dire report to date—another in a string of reports, each with more urgent language and frightening scenarios than the one before. The new IPCC report warns that at least three-quarters of known fossil fuel re-

serves must remain in the ground if we are to avoid a 3.6-degree Fahrenheit (two-degree Celsius) rise in global temperatures over preindustrial times (see “The Mystery of the Three Scary Numbers, p. 180 and “A Matter of Degrees,” p. 191). The consequence of exceeding these limits would “almost certainly have catastrophic effects, including a mass extinction of plants and animals, huge shortfalls in food production, extreme coastal flooding, and many other problems,” according to the *New York Times*, which received a draft of the report.

The news is bad. But **despite the dimensions of the environmental crisis, students can approach this frightening content in ways that are lively and playful.** Not long ago, we participated in a weeklong teach-in for 6th through 8th graders about energy issues at Sunnyside Environmental School, a public school here in Portland. Throughout the week, students heard speakers and participated in activities about everything from mountaintop removal coal mining to catastrophic oil spills to the civilization-threatening consequences of climate change. They also encountered people working on solar and wind power, local food initiatives, and other innovative responses to environmental challenges; but the week definitely offered an adult dose of planetary crisis. Nonetheless, in classrooms we visited during the concluding activist projects that students worked on, these middle schoolers were anything but grim; and their small-group work was electric with idea sharing and laughter. As with adults, we’ve found that students are able to live with contradiction; students grasp the sadness and injustice at the heart of the environmental crisis while finding joy and humor. For the book, we’ve selected activities that address key environmental concerns, but these activities do not invite despair. They are engaging, and feature collective work that triggers student playfulness and imagination.

Interconnections

Throughout the final stages of working on this book, we collaborated with Portland teaching colleagues Chris Buehler, Julie Treick O’Neill, and Matt Plies on a role play about La Vía Campesina. Despite the fact that La Vía Campesina may be the largest social movement in the world—with more than 200 million small farmers in its affiliated organizations—it’s

pretty much impossible to find its work described in today's mainstream textbooks. We conclude *A People's Curriculum for the Earth* with La Vía Campesina efforts because we think that **it highlights the way a deep response to any one crisis—for example, how to feed a world populated by perhaps a billion hungry people—addresses other social and environmental crises.** La Vía Campesina presents a grassroots, agroecological challenge to agribusiness globalized, free market, chemical-drenched, genetically modified prescription for the world's food production. The peasant movement shows that addressing hunger can simultaneously address climate change, inequality, public health, unemployment, forced migration, and much more. These are the kind of interconnections that infuse our curricula with hope—offering students the sense that fundamental change is not only desperately needed but also possible.

Challenging Curricular Apartheid

The teaching we observed at Sunnyside Environmental School showed us what happens when teachers collaborate across disciplines. Unfortunately, in too many schools, the environmental crisis seems to have become a kind of curricular hot potato. No discipline wants to claim the crisis as its own. We get it. We are both high school social studies teachers and we often bump up against our own shaky grasp on scientific concepts, trying to recall details from past biology and chemistry classes. While teaching one climate lesson at Lincoln High School, a student made an assertion about the impact of methane versus carbon dioxide that stumped us both and sent us combing through IPCC reports that evening. We try not to let these moments force us to retreat into the silo that traditionally has been considered social studies. And we've spoken with science teachers who feel that analyzing the social causes and effects of climate change reaches beyond their curricula or of their own knowledge. Similarly, teachers in language arts, mathematics, world languages, business, physical education, or art may wonder "What does this have to do with my class?"

But **in this moment of crisis, it's imperative that we reject artificial barriers between disciplines.** Throughout this book we've featured stories from educators who consciously cross conventional

curricular boundaries—see for example, "Carbon Matters" (p. 110), "Science for the People" (p. 273), "Measuring Water with Justice" (p. 297), and "Facing Cancer" (p. 309). Throughout the curriculum, educators can collaborate to help students become the scientist-activists they need to be. Confronting the toxic injustice that has become one of the defining features of our time requires us immediately to begin constructing a fossil fuel-free world built on principles of ecology and justice, rather than profit and endless growth. No matter which classes we teach, educators need to find ways to help young people develop the analytical tools to understand the causes of the environmental crisis and to exercise their utopian imaginations to consider alternatives.

The peasant movement shows that addressing hunger can simultaneously address climate change, inequality, public health, unemployment, forced migration, and much more.

Political and Educational Context

In an article in the *Guardian*, Naomi Klein, author of *This Changes Everything: Capitalism vs. the Climate*, laments the "bad timing" of the climate crisis:

Our problem is that the climate crisis hatched in our laps at a moment in history when political and social conditions were uniquely hostile to a problem of this nature and magnitude—that moment being the tail end of the go-go '80s, the blast-off point for the crusade to spread deregulated capitalism around the world. Climate change is a collective problem demanding collective action the likes of which humanity has never actually accomplished. Yet it entered mainstream consciousness in the midst of an ideological war being waged on the very idea of the collective sphere.

That same war has been waged in the education arena. At the precise moment we need our schools to educate and engage the next generation about the historic global challenges we face, public education is under attack from the same private and corporate

CLIMATE JUSTICE SEED PACKAGE PREVIEW

interests that have polluted our natural and social environments. Curriculum is being standardized and narrowed to what can be poorly measured by bubble tests. Decisions about what schools should teach and children should learn are being moved away from classrooms and communities to the same politicized bureaucracies and monied interests that

are undermining democracy. This too is “bad timing.” At a time when we need an urgent national conversation about how schools and curriculum should address the environmental crisis, we’re being told that the problems we need to focus on are teacher incompetence, government monopoly, and market competition. The

reform agenda reflects the same private interests that are moving to shrink public space—interests that have no desire to raise questions that might encourage students to think critically about the roots of the environmental crisis, or to examine society’s unsustainable distribution of wealth and power.

* * *

This book is not so much “a people’s curriculum for the Earth” as it is an invitation to begin to build that curriculum. And it’s encouragement to educators to demand the right to effect a curriculum that honestly and deeply addresses the environmental crisis. Some of this work will go on in our classrooms; in meetings with other teachers; in teacher social justice conferences in San Francisco, New York, Milwaukee, Atlanta, Chicago, and Seattle; in our professional organizations; in the pages of *Rethinking Schools* magazine; and at the Zinn Education Project and This Changes Everything websites. And some will go on in our unions, community organizations, and other activist organizations where we fight to teach about crucial issues in the world.

The intertwined social, economic, and environmental crises that confront humanity require us to be audacious. As Naomi Klein writes, this is “the fight of our lives.” For educators, this is the curriculum work of our lives. And, yes, it is a fight, too. We need to demand and organize for the right to teach about what really matters, and not be forced to

toe the textbook line or obey “rigorous” standards, developed afar, that may or may not help students appreciate and act on this moment in history.

We educators need to imagine, cooperate, create, hope—and at times, defy and resist. And we need to see ourselves as part of a broader movement to build the kind of society that is clean and just and equal and democratic. One that seeks to leave the world better than we found it. 🌐

**For educators,
this is the
curriculum
work of our
lives. And, yes,
it is a fight, too.**

CHAPTER ONE: **The Whole Thing Is Connected**



SIMONE SHIN

“It really boils down to this: that all life is interrelated. We are all caught in an inescapable network of mutuality, tied into a single garment of destiny. Whatever affects one destiny, affects all indirectly.”

—Martin Luther King Jr.



NASA.GOV

INTRODUCTION

The Whole Thing Is Connected

If we had to distill the articles and teaching activities in *A People's Curriculum for the Earth* down to one key point, it's that "everything is connected."

In his article "Smarter Than Your Average Planet," David Suzuki writes, "Interwoven, interlinked, joined, chained, bonded, coupled—no matter how you describe it, everything in nature seems somehow connected to everything else." Suzuki emphasizes the peril of thinking that there is some *away* where we can pollute without consequence. The hopeful piece of this ecological "an injury to one is an injury to all" is that everyone—everywhere—has an opportunity to make a positive planetary difference.

Van Jones uses the issue of plastic to point out that we may be connected, but we are not connected *equally*. Jones argues we are linked to cycles of production and consumption that are toxic—to nature and also to people. This toxicity falls hardest on poor people and people of color. And he chides environmentalists for often caring more about pollution's effect on nature than on human beings. According to Jones, our society treats *stuff* as disposable, but it also treats *people* as disposable—and both are part of the same process.

Christian Parenti extends the "everything is connected" concept to climate change, charting the chain of events from drought to the price of bread to uprisings in the Middle East. It's just one example. Corporations mining coal in Wyoming or chopping down rain forests in Indonesia similarly contribute to desertification in East Africa and thus to armed conflicts between livestock herders. It's another instance where people are connected, but connected unfairly, as those least responsible for pollution are the ones to suffer the most.

Indian physicist, environmentalist, and philosopher Vandana Shiva contrasts two views of nature—one that denies people's reliance on and connection to the Earth, and the other that affirms

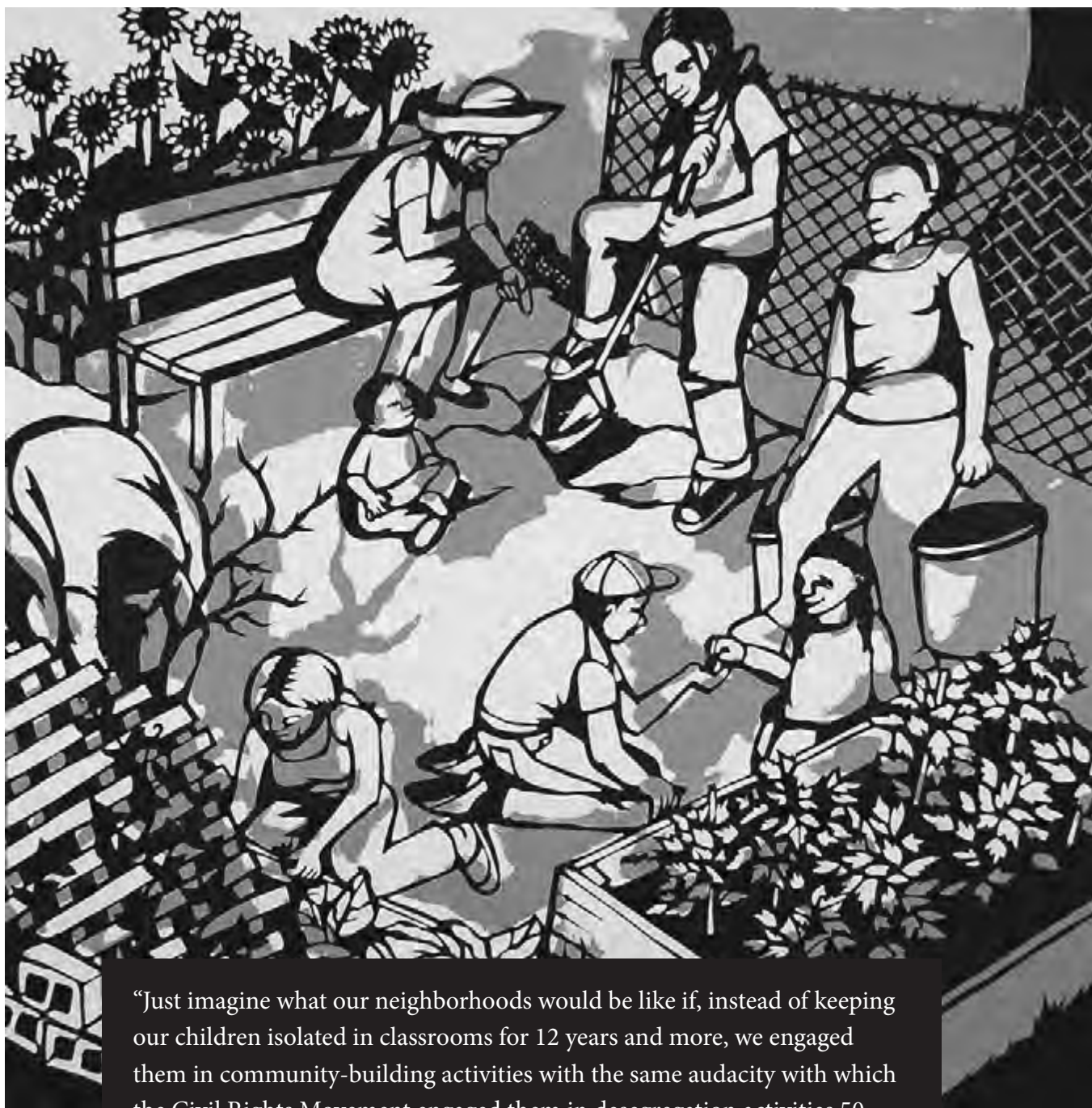
them. Shiva critiques the notion that the Earth is dead matter: "The death-of-nature idea allows a war to be unleashed against the Earth." By contrast, she celebrates the Indian Chipko movement: "Women knew that the real value of forests was not the timber from a dead tree, but the springs and streams, food for their cattle, and fuel for their hearths."

And here lies the choice this first chapter highlights: We can continue the "enclosure of the commons," begun so long ago—the privatization and commodification of nature—or we can recognize the fundamental truth that we are all connected and that there is nothing "private" about how we treat the Earth, or each other.

—the editors







BEC YOUNG

“Just imagine what our neighborhoods would be like if, instead of keeping our children isolated in classrooms for 12 years and more, we engaged them in community-building activities with the same audacity with which the Civil Rights Movement engaged them in desegregation activities 50 years ago! Just imagine how safe and lively our streets would be if, as a natural and normal part of the curriculum from K-12, schoolchildren were taking responsibility for maintaining neighborhood streets, planting community gardens, recycling waste, rehabbing houses, creating healthier school lunches, visiting and doing errands for the elderly, organizing neighborhood festivals, and painting public murals!”

—Grace Lee Boggs

INTRODUCTION

Grounding Our Teaching

As Oberlin College professor David Orr famously wrote, “All education is environmental education. . . . By what is included or excluded we teach the young that they are part of, or apart from, the natural world.”

Whether in biology, history, math, or PE, all curriculum teaches students about their relationship to the Earth—and specifically about their relationship to where they live. Unfortunately, too often students learn contempt for the Earth. Students learn that “real” education—the stuff that will make them “college and career ready”—takes place in a classroom, on a computer, or while listening to a teacher. Today, under the iron heel of standardized testing, many schools have even abolished recess. And budget cuts have erased field trips.

By contrast, the articles in this chapter demonstrate ways of fostering what early childhood educator Ann Pelo calls “an ecological identity.” Part of “grounding our teaching”—literally—means getting students outside the classroom, to notice, to question, to listen, to smell, to feel, to “story” the world around us. This is the key insight of what has come to be called place-based education: We can center our teaching on the places we live—and not just in science class, but throughout the curriculum as well.

What happens when we focus our teaching about nature only on the far away—on the proverbial polar bear? In his article “Exploring Our Urban Wilderness,” teacher Mark Hansen writes:

Ask students what they know about the impact of deforestation on animal habitats and if they offer any answers at all, I’d wager they are more likely to bring up the Amazon than the impact of urbanization and industrial agriculture on the songbird populations in their own communities. This lack of grounding may help explain why critical ecological issues like global warming, groundwater pollution, and deforestation seem so remote to most children.

Too often, environmental education stops with knowledge of plants and animals. But the articles in this chapter on Turkey Creek in Mississippi and oil pollution in Milwaukee, Wisconsin, underscore that the environment also includes people. Grounding our students in their communities doesn’t just connect them to nature; it also connects them to the ways their communities have been battered by powerful interests, and how those communities have been shaped by race and class.

The saying “know your place” is a command to not rock the boat, to not challenge one’s position in a hierarchy. In this chapter, it means the opposite. We can teach students to know their place—to care enough about our communities that they are willing to defend them, and to make them better.

—the editors



MIRIAM KLEIN STAHL

CHAPTER THREE: **Facing Climate Chaos**



ERIK RUIN



“To anyone outside who continues to deny and ignore the reality that is climate change, I dare them—I dare them to get off their ivory towers and away from the comfort of their armchairs. I dare them to go to the islands of the Pacific, the Caribbean, the Indian Ocean, and see the impacts of rising sea levels; to the mountainous regions of the Himalayas and the Andes, to see communities confronting glacial floods; to the Arctic, where communities grapple with the fast-dwindling sea ice sheets; the large deltas of the Mekong, the Ganges, the Amazon, the Nile, where lives and livelihoods are drowned; to the hills of Central America, that confront similar monstrous hurricanes; to the vast savannas of Africa, where climate change has likewise become a matter of life and death as food and water becomes scarce—not to forget the monstrous storms in the Gulf of Mexico and the Eastern Seaboard of North America, as well as the fires that have raged Down Under. And if that is not enough, they may want to see what has happened to the Philippines now.”

—The Philippines’ climate chief Naderev “Yeb” Saño, Nov. 11, 2013, at the U.N. Climate Change Conference, Warsaw, Poland



INTRODUCTION

Facing Climate Chaos

In January 2014, a poll conducted by the Pew Research Center found that people in the United States ranked global warming 19th on a list of the top 20 issues that they thought Congress and the president should address.

Schools share at least some of the responsibility for people's failure to recognize climate change as the life-altering issue that it is. For example, the adopted physical science textbook in our allegedly green city of Portland, Oregon—published by Pearson/Prentice Hall—buries its one-page coverage of climate change on p. 782. The few paragraphs seem designed to sow doubt. The section begins: "Human activities may also change climate over time." *May*. In textbooks, education journals, schools of education, and Common Core State Standards, one senses no curricular emergency when it comes to teaching about the climate.

We hope the articles in this chapter will help students recognize the significance of the climate crisis. And we also want them to see that the people being hit the hardest are the ones least responsible for it. Those people have names and stories. We focus especially on the impact of climate change on Indigenous peoples. As Matthew Gilbert of the Arctic's Gwich'in people writes in the chapter's first article, "Farewell, Sweet Ice": "Because nature is the fabric of our lives, we cannot really separate 'the climate' from our human selves. So when we talk about the environment and especially about the decline of caribou, we are talking about who we are and who we want to continue to be. It is a ques-

tion of our very survival as a people."

Too often, explanations for the climate crisis are not really explanations at all; they are descriptions, as in "We are pouring too much carbon dioxide into the atmosphere." Yes. But why? And is it really accurate to say that "we" are doing this? Through activities like the Thingamabob simulation and the climate trial role play, students consider root causes of the crisis—an essential inquiry, if students are to think about the deep social changes we will need to respond fairly and decisively.

And that is a theme that runs throughout the chapter: We can take action to address this crisis, and people *are* taking action. Whether it is Rachel Cloues' 4th graders in "Polar Bears on Mission Street," the activists highlighted in the Climate Change Mixer, or the organizers of the Indigenous Peoples' Summit on Climate Change, people are acting for justice. And this activism is a much-needed antidote to despair. 🌍



ERIK RUIN



RINI TEMPLETON

Climate Change Mixer

BY BILL BIGELOW

No doubt, climate change affects everyone, everywhere. But not equally. Through role play, the Climate Change Mixer introduces students to 17 individuals around the world—each of whom is affected differently by climate change. For some, climate change threatens to force them to leave their land. For others, it is a business opportunity. In this activity, students meet one another in character and learn about the impact of climate change in their lives—and how each is responding.

Materials Needed:

- Mixer roles, cut up. One for every student in the class.
- Blank nametags. Enough for every student in the class. (Optional, but advised.)
- Copies of “Climate Change Mixer” questions for every student.

Time Required:

- One class period for the mixer. Time for follow-up discussion.

Suggested Procedure:

1. Explain to students that they are going to do an activity about the impact of climate change around the world. Distribute one role to each student in the class. There are only 17 roles, so in most classes, more than one student will be assigned the same individual. That's not a problem. You might point out to students that all of the roles describe actual people. In some cases, the roles incorporate these individuals' own words.

2. Distribute and have students fill out their nametags, using the name of the individual they are assigned. Tell students that in this activity you would like each of them to attempt to become these people from around the world. Ask students to read their roles several times and to memorize as much of the information as possible. Encourage them to underline key points. I ask students to list the three or four things they think are most important about their characters.

3. Distribute a copy of "Climate Change Mixer" to every student. Explain their assignment: Students will circulate through the classroom, meeting other individuals who also have some connection to global warming. They should use the questions on the sheet as a guide to talk with others about climate change and to complete the questions as fully as possible. Emphasize to students that they must use a different individual to answer each of the eight questions. (This is not *The Twilight Zone*, so students who have been assigned the same person may not meet themselves.) Tell them it's not a race; the aim is for students to spend time hearing each other's stories, not just hurriedly writing down answers to the different questions. Any role play risks stereotyping, so tell students not to adopt accents in an effort to represent an individual from another country. Encourage students to speak as if they are their assigned characters. Emphasize the use of the "I" voice, as sometimes students will begin by saying something like "My character lives in Bangladesh." It's important to the success of the activity that they attempt to *become* their characters—for example, to say, "I live in Bangladesh." Note that it's best to encourage students to meet one on one, as they circulate throughout the classroom. Some-

times students will cluster in groups, but this tends to allow some students to be passive and simply listen to others' conversations, rather than engaging in their own. Encouraging students to discuss the questions in pairs helps to address this potential problem. Finally, the last two questions ask students to begin to think about possible solutions. Tell students that answering both of these questions means they don't have to limit themselves to the information included in their role descriptions; they should try to propose ideas that are consistent with their characters' circumstances and concerns. For example, in one class, students playing two different individuals harmed by climate change decided they would make a film about the negative impact of rising temperatures throughout the world. This solution was not included in either role, but it was a creative response.

4. Ask students to stand up and begin to circulate throughout the class to meet one another and to fill out responses on the "Climate Change Mixer" questions student handout.

5. There is no set length of time for the mixer. I generally play a character myself so I can get a feel for how it's going and how much time students need. Allow at least a half hour for students to circulate.

6. After the students meet the other individuals, ask them to write briefly on some of what they learned from meeting people from around the world. Questions that I've used:

- Whom did you meet, or what situations did you hear about, that surprised you? Did you have any "aha's" while talking with people?
- Did anyone make you angry? Who?
- What themes seemed to come up in your conversations?
- Whom did you meet or which situations did you hear about that gave you hope?

7. Discuss these with students. See my article, "Teaching the Climate Crisis," on p. 79, for a description of how this played out with one group of students Tim Swinehart and I worked with.

Climate Change Mixer

1. Find someone who is hurt by climate change. Who is the person? How has this person been hurt? How might he or she be hurt in the future?
2. Find someone who might benefit from climate change. Who is the person? How might the person benefit?
3. Find someone who is affected by climate change in a way that is similar to how you're affected. Who is the person? How are your situations similar?
4. Find someone whose story involves a connection between water and climate change. Who is the person? What's the connection?
5. Find someone who will have to make life changes because of climate change. Who is the person? Why does this person have to make a life change? What might this individual do?
6. Find someone who lives on a different continent from you. How is this person affected by climate change? How is it different or similar to how you're affected?
7. Find someone who has an idea about what should be done to deal with global warming—or someone who is taking action in some way. Who is the person? What is the person's idea or action?
8. If possible, find someone here with whom you could take some joint action around global warming. Who is the person? What action might you take in common?

Larry Gibson

Mountaintop removal activist, Kayford Mountain, West Virginia

They say that to move away from oil we need to rely more on “clean coal,” mined here in the USA.

Clean coal. That’s a lie. That so-called clean coal comes from mountains in Appalachia that have been destroyed by coal companies, like Massey Energy. They blast mountains apart to get at the coal and dump everything they don’t want in the valleys and streams, poisoning everything around.

When they talk about clean coal, they sure don’t mean how they got it. They want you to focus on the fact that burning coal today produces less sulfur dioxide than it used to. That’s the stuff that causes smog and acid rain. But burning coal still releases about twice as much carbon dioxide as natural gas, and a third more than oil—for the same amount of energy. And carbon dioxide is a greenhouse gas, the gases that cause global warming.

So mining coal is bad for the people of Kentucky and West Virginia, but it’s also bad for the planet.

I’ve been fighting mountaintop removal of coal for more than 25 years. I’m not going to sit around and watch my home and the planet be destroyed. The coal companies care about the money. For me, it’s not about the money. It’s about the land. My mother gave me birth. The land gives me life. 🌍

Roman Abramovich

Sibneft Oil Co., Russia

Recently, I’ve seen a lot of articles asking whether global warming will be “good for Russia.” This is a dumb question. Like anything, it will be good for some people and bad for some people. But I am doing everything I can to make sure that I am one of the people who benefits from global warming.

It’s simple: As temperatures rise every year, ice will melt and huge new areas will be open for oil and gas exploration in the Arctic. And as one of Russia’s wealthiest men, and head of a large oil and gas company, this is the chance of a lifetime. Researchers tell us that one quarter of the Earth’s untapped fossil fuels, including 375 billion barrels of oil, lie beneath the Arctic. In the industry, we’re talking about this opportunity as the new “black gold rush.” Already our competitors in Norway—Statoil—are working on project Snow White, which will generate an estimated \$70 billion in liquefied natural gas over the next 30 years. I’m not going to sit back and let the Norwegians or anyone else beat me out of this new business opportunity.

I’m sure that global warming is bad for a lot of people, but I’ll leave that to the politicians and scientists. I’m a good businessman—a good *oil* businessman—so it’s time to get to work. 🌍

Wangari Maathai

Green Belt Movement, Kenya

Africa is the continent that will be hit hardest by global warming. Unpredictable rains and floods, prolonged drought, crop failures, and fertile lands turned into deserts have already begun to change the face of Africa. The continent’s poor and vulnerable will be hit the hardest. Already, some places in Africa are seeing temperatures rising twice as fast as world averages.

Wealthy countries will be affected, too. But for us, this is a matter of life and death. What makes this so outrageous is that our output of greenhouse gases is tiny when compared to the industrialized world’s output. So the industrialized nations need to raise steady and reliable funds for the main victims of the climate crisis: the poor throughout the world.

For my part, I’ve been working in the Green Belt Movement for the last 30 years, since I was a young woman. We have mobilized millions of individual citizens in every country to plant trees, prevent soil loss, harvest rainwater, and practice less destructive forms of agriculture. We must protect the trees from the logging that is turning our continent into a desert. Our goal is to plant a billion trees. We will do our part to save the planet, but it is the rich countries that are most responsible. 🌍

Enele Sopoaga

Prime Minister, Tuvalu

Most people have never heard of my little island that is 400 miles from Fiji in the South Pacific. Tuvalu has 10,000 people in a place that averages just six feet above sea level. My people live on fish and fruit; everyone knows their neighbors and people don't even lock their doors.

Rising sea levels, caused by global warming, threaten the very existence of my land and people. Beginning in 2000, at high tide the water began covering places on the island that had never before been covered in the memory of even the oldest residents. In August 2002, the entire island flooded and the increased salinity [salt] has forced families to grow their root crops in metal buckets instead of in the ground. Many people believe that if current trends continue, there will be no more Tuvalu in less than 20 years.

The former prime minister of Australia said that if Tuvalu disappears, people should be relocated elsewhere. What incredible selfishness. How can anyone say that people in Tuvalu should suffer so that people in the so-called developed world can continue to fill our atmosphere with carbon dioxide by driving their big cars and buying stuff made halfway around the world? This is sick. That is why I have been speaking out. 🌐

Matthew Gilbert

Member of Gwich'in Tribe, Northern Alaska/Northwestern Canada

I am a member of the Gwich'in, the northernmost Indian nation on the American continent. There are about 8,000 Gwich'in. Because of global warming, we are threatened as a people.

We survive mostly from hunting caribou. Less snowfall is making sled and snowmobile transportation more difficult. Creeks are freezing later, and the ice is too thin to carry heavy loads. Lakes are drying up.

The worst threat is to the caribou. In 10 years, their number dropped from 178,000 to 129,000. Calves drown when they try to cross rivers that are usually frozen. My grandfather remembers vast numbers of caribou moving in waves near their village during spring and summer. No more. Our environment is in chaos. The hunters find it harder and harder to find the caribou that feed our people.

We must reduce greenhouse gases. My people are dying. 🌐

Chris Loken

Apple grower, Hudson Valley, New York

Everybody is saying awful things about global warming, and I know that it's bad for a lot of people. But recently Fox News did a report on climate change "winners" and they came to talk to me. As they said in their report, "There are some upsides to global warming."

Frankly, I saw this coming. I knew that things were going to get warmer and you know what they say about a crisis: It's also an opportunity.

I live in a beautiful place. Rolling hills. Good for apple trees. But I decided to diversify. Right next to the apples, I planted peach, apricot, and plum trees. Years ago. As I say, I saw this coming. These trees wouldn't have survived the winters of the old pre-global warming days. But our winters are getting milder, and I'm betting my trees will do just fine. As I told the Fox News people: "This farm here has been set up for the future." It's not easy running a farm these days, and if the weather decides to cooperate a little bit, who am I to argue? I'm sorry for those folks who are hurt by all this, but I've got to think of my family. 🌐

Stephanie Tunmore

Greenpeace climate campaigner

I joined the environmental organization Greenpeace because I felt like I had to do something to make the world a better place. To me, it seems that climate change is the most dangerous problem facing humanity and the environment. The consequences of global warming will be catastrophic, and we have to do something.

I've been working to save the Arctic. People think of the Arctic as just one big empty block of ice and snow. Either that, or where Santa Claus and the elves live. But it's an unbelievable place. There are species of birds and fish that are found only there and a few other places. Polar bears, musk oxen, and caribou reside there; and in the summer, snowy owls, ducks, and swans migrate there to nest. But already Alaska's North Slope has been taken over by 28 oil production plants, almost 5,000 wells, and 1,800 miles of pipes.

But the oil companies see global warming and the melting ice as an opportunity to drill for even more oil and gas. Haven't we learned anything? Why are we looking for more fossil fuels? The good thing is that more and more people are determined to stop oil development. We've taken direct action and have confronted the oil drillers in places like the Beaufort Sea, where we towed a fiberglass dome with two Greenpeace activists inside into a BP Northstar oil-drilling construction area. Two other activists unfurled a banner: **"Stop BP's Northstar, Save the Climate."** Direct action. That's what it will take to stop these oil-drilling criminals. 🌐

Rafael Hernandez

Immigrant rights activist, The Desert Angels, U.S.-Mexico border

In 1986, I crossed the border from Mexico to the United States, looking for a better life for my family. Now I am committed to helping migrants in need. My group, Los Angeles del Desierto—The Desert Angels—patrols both sides of the Mexican-California border near San Diego. We look for lost migrants and leave water, clothing, and food at key spots in desert locations to help people on their journey.

Recently, we rescued María Guadalupe Beltrán, a 29-year-old mother of four who had been burned severely in the huge Harris Fire on the border. Her father had died in Mexico and she had returned home to attend his funeral. She was caught in the fire coming back into the United States. But after suffering terribly, Beltrán died of her injuries. Afterward, I spoke to her husband, Rafael, who sat by her hospital bed for two weeks. He told me: "I asked the Virgin: 'Tell me whatever you want, please just don't take her.' But she did. At 11 in the morning my wife went away. She died at 11." Six migrants died in the fire and eight were injured.

The border patrol has pushed migrants to cross in unsafe desert areas. And global warming is making these areas even more unsafe, more deadly. Climate experts say that these wildfires, just like the awful ones in Greece, Australia, and Colorado, are going to happen more and more as the climate shifts. So María and other wildfire victims are also victims of global warming. 🌐

Rinchen Wangchuk

Snow Leopard Conservancy, Ladakh, India

When I was a boy, after school ended for the summer, I remember slipping down the glacier that stretched far down the mountains near my village in the Nubra Valley—in Ladakh, the far northern part of India. Today, that glacier is almost gone. And I am watching the glaciers of the Karakoram Mountains disappear a little more every year. One study found that each year, the glaciers lost between 49 and 66 feet, and another found that since the 1960s, more than 20 percent of the glaciers have disappeared. And as global warming increases, the glaciers will begin to melt faster and faster.

Glaciers are ice that has built up over thousands of years. Because it rains only two inches a year in Ladakh, we depend on the glaciers for 90 percent of our water. Farmers depend on this water to irrigate fields, and everyone depends on it for drinking. Ladakhis in the villages have worked out a cooperative system to share the water, but what will happen if the glaciers disappear? How will we survive?

In the rural areas of Ladakh, we have almost no cars. We pollute very little and release almost no greenhouse gases. It is unfair that the rich countries that produce so much carbon dioxide should be destroying the glaciers we depend on. 🌍

Moi Enomenga

Huaorani Indian, Eastern Ecuador

For years, the oil companies have invaded my people's lands and the lands of neighboring peoples—the Shuar, the Cofan, the Sequoya—in the rainforests of eastern Ecuador. First was Texaco. They left thousands of open pits that poisoned our rivers. Oil companies have spilled millions of gallons of crude oil and they continue to dump toxic chemicals into our rivers and streams. And oil development has also led to deforestation. When the oil companies build the roads, other “settlers” move in and chop down our forests and scare away our game.

With oil comes destruction. And now we learn that not only is oil development destroying our rainforest, it is destroying the world, through carbon dioxide pollution that leads to global warming. Oil kills the Huaorani through pollution and kills everyone through global warming. We say, “Leave the oil in the ground.” Why do rich countries come here? People from the richest and most populated countries come to the poorest to take our resources, to live their life better, and leave us even poorer. But we are richer than they because we have the resources and the forest, and our calm life is better than their life in the city. We must all be concerned because this is the heart of the world and here we can breathe. So we, as Huaorani, ask those city people: Why do you want oil? We don't want oil. 🌍

Anisur Rahman

Mayor of Antarpapa, Bangladesh

I am the mayor of Antarpapa, a village in Bangladesh. Antarpapa is on the Brahmaputra River that flows from the Himalaya Mountains in India. We are in the lowlands, and our village floods every year. We are used to it, and, in fact, the flooding is good because it leaves our land more fertile.

But now the floods are much worse. Now the floods are huge and each year they destroy our homes and carry off the land underneath them. My village used to have 239 families. Now we are 38 families. But where can we go when our homes are gone? Our country has 150 million people—the most densely populated in the world. I have an 18-month-old child. By the time she is grown, this village won't be here.

Where are we supposed to go? Do we all get tickets to America? 🌍

Steve Tritch

President and CEO, Westinghouse Electric

Before I became the head of Westinghouse I was senior vice president for Nuclear Fuel, providing nuclear fuel products and services to nuclear power plants throughout the world. Before that, I led the merging of the former ABB nuclear businesses into Westinghouse Electric, and was senior vice president of nuclear services. And before that, in 1991, I became manager of the Nuclear Safety Department, and later was appointed general manager of Westinghouse's Engineering Technology. Today, I belong to the American Nuclear Society and serve on the Nuclear Energy Institute's board of directors. I guess you could call me Mr. Nuke.

You might say that I'm a man on the hot seat these days. Not only are we running out of easy-to-find oil, but oil is also blamed for global warming. Coal is an abundant source of power, but it produces even larger amounts of greenhouse gases than oil—or natural gas. People are looking to my company, Westinghouse, for solutions. The solution is obvious: nuclear power. As I tell my employees, "What's good for the planet is good for Westinghouse."

Sure, the accident at the Fukushima nuclear plants in Japan was serious, and people were hurt. But the whole industry has learned from this accident, and even Japan still knows that nuclear power is the best way to go. The real threat is global warming. Global warming could destroy much of life on Earth. But nuclear power produces no greenhouse gases. They say nuclear power has dangers. Well, last year 5,200 Chinese coal miners died in accidents—and that's a lot more than have ever been hurt in a nuclear power accident. I see hope for the planet and Westinghouse is here to play our part. 🌍

Nancy Tanaka

Orchard Owner, Hood River Valley, Oregon

Our family has owned and operated fruit orchards in Oregon's Hood River Valley since my husband Ken's grandparents bought land here in 1917. Our family's only "time off" was when the U.S. government locked our family in internment camps during World War II. But that's another story.

Every generation of our family has farmed this land. And then we woke up to the front-page article in our local newspaper. It was a shocker. In fact, it scared us half to death. A study by Oregon State University found that 75 percent of the water during the summer months in the Upper Middle Fork of the Hood River comes from melting glaciers on Mt. Hood. And because of global warming, the glaciers are disappearing. That's our river. Well, we don't own it, but it's the river that irrigates our pears and cherries. Our family has grown fruit on this land since before we were born, and now they tell us that our irrigation water may be disappearing?

To tell you the truth, I never knew so much of the river's water in the summer came from glaciers. You see, glaciers on Mt. Hood are kind of small compared with glaciers on other mountains. Scientists say the problem is that glaciers have been shrinking because of global warming. I always thought global warming might affect the Arctic and the polar bears, but not the Upper Middle Fork of the Hood River. 🌍

Trisha Kehaulani Watson

Environmental lawyer, Hawaii

I was born and raised in the valley of Manoa, in the district of Kona (known today as Honolulu), on the island of Oahu. I am native Hawaiian. I am a lawyer specializing in environmental law—but much of my knowledge comes from talking with my family and *kupuna*, our elders.

Over the years, I have seen the beaches I played on my entire life steadily erode. In many places, the sand is disappearing.

My valley has always been very *waiwai* (wealthy, rainy, with much fresh running water), yet the waters have changed. We have far more unstable weather. When I was a little girl my grandfather used to take me down to the streams to watch the water rise when the heavy rains came. But things are much different today. The heavy rains are devastating. A few years ago we had a terrible flood wash through the valley. Since then, my street has been shut down numerous times due to dangerous flooding.

The seasons have also changed. It gets much colder than it used to, and also much hotter. The plants have changed because of it. Fruits come at unusual times of the year. Flowers bloom at different times of the year. Health problems also result from these weather changes.

The Earth is not well. 🌍

James Hansen

Former director, Goddard Institute for Space Studies, National Aeronautics and Space Administration (NASA), New York, City

I am a scientist, but I am also a grandfather. So that makes me especially interested in the future.

Recently, I was arrested at the White House in Washington, D.C., protesting the construction of the 1,700-mile Keystone XL Pipeline to send oil from the Tar Sands of Alberta, Canada, to Texas. Why would a scientist and a grandfather commit civil disobedience and get arrested? That's simple. If this pipeline is built and they continue to take this especially dirty and polluting oil from the Canadian Tar Sands, it makes it very unlikely that we will be able to stabilize the climate and avoid the disastrous effects that we are already beginning to see. As I've said, this pipeline is the fuse to the biggest carbon bomb on the planet.

Many years ago, I was one of the first scientists to warn that as we burn more fossil fuels—coal, oil, natural gas—the carbon dioxide created will heat the Earth to dangerous levels, with terrible, terrible consequences. I thought people would respond to scientists' rational arguments that we needed to end our addiction to fossil fuels. Now I know we need to take more drastic action.

So I volunteered to be arrested with 1,200 other people to draw attention to the importance of stopping this deadly pipeline from being built. I am more than 70 years old, but if need be, I will keep getting arrested. 🌍

Robert Lovelace

Ardoch Algonquin Indian leader, Ontario, Canada

In mid-February 2008, I was sentenced to six months in jail and ordered to pay a \$15,000 fine. What was my “crime”? Trespassing on my own land—trying to block a uranium company, Frontenac Ventures, from prospecting on and polluting Algonquin Indian land. It began when we noticed people cutting down trees on land we had never ceded to the Canadian government. Someone had given Frontenac a prospecting license and they had gotten a court to issue an injunction against “trespassing.” But this is our land, and Algonquin Indians and our non-Indian supporters organized a 101-day blockade to physically stop Frontenac from destroying the land. I was arrested and became a political prisoner.

Because of global warming, the nuclear power industry is claiming it is the “clean” alternative, because nuclear power does not generate greenhouse gases like coal or oil. The price of uranium shot from \$43 a pound in 2006 to \$75 a pound a couple of years after. It came down as a result of the 2011 nuclear disaster in Japan, but it will go back up. Canada is already the world’s leading exporter of uranium, and our prime minister wants to increase exports and turn Canada into an “energy superpower.”

There is nothing good about uranium mining. Uranium mining has no record other than environmental destruction and negative health issues. Mining companies clearcut the land and destroy the Earth to get at the uranium. Uranium can’t be stored safely and other uranium mines around Canada have left land polluted with heavy metals like arsenic. And nuclear power itself is not clean. Nuclear waste stays radioactive for thousands of years and no one has found a safe way to store nuclear poisons that long. 🌐

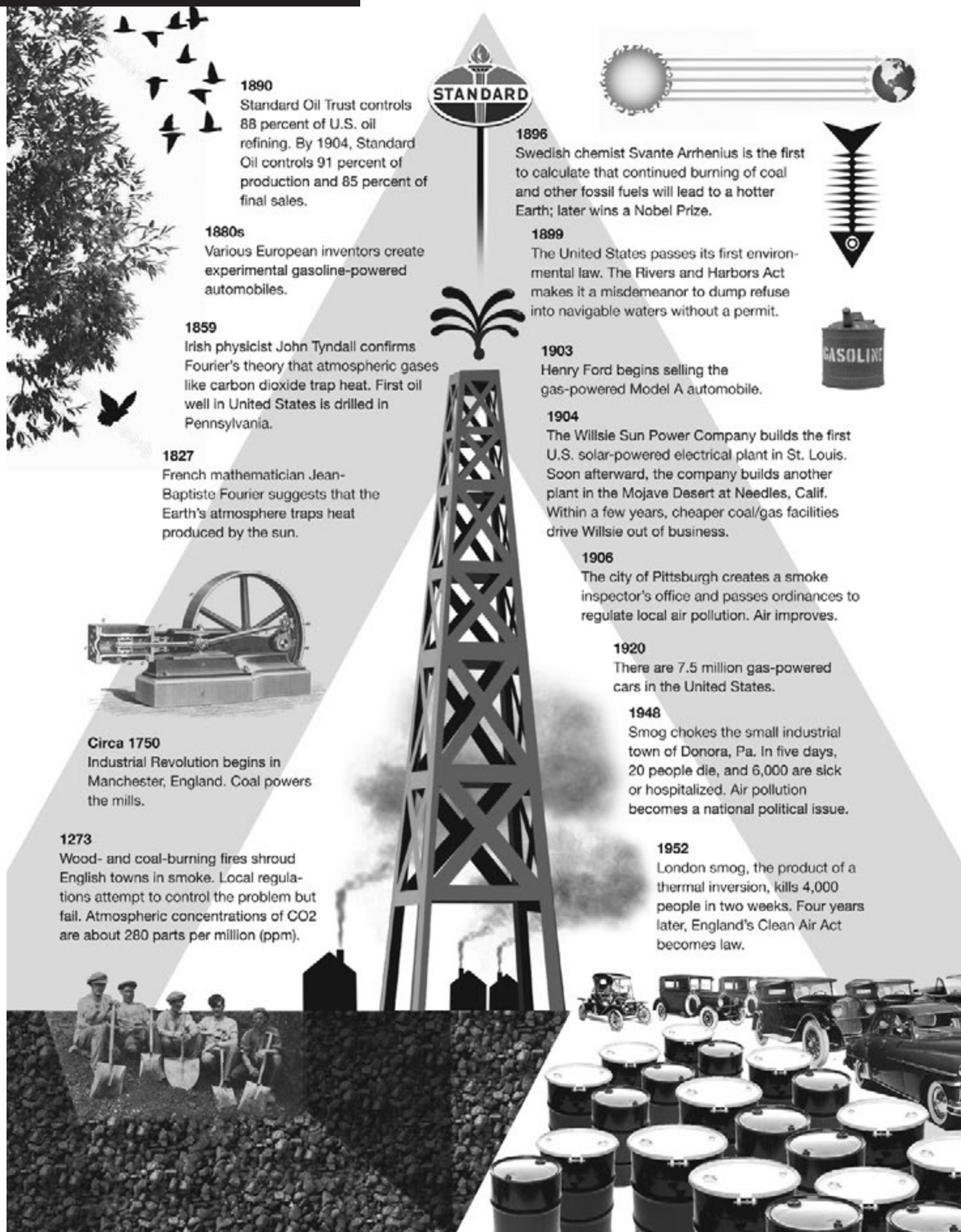
Richard H. Anderson

CEO, Delta Airlines, Atlanta

I am CEO of Delta Airlines, and live in Atlanta. I’m a businessman and a lawyer, and have been in the airline business for more than 20 years. My job is to oversee Delta’s long-term goals. Ultimately, I need to keep the company profitable for our investors and a secure and fulfilling place to work for our 80,000 employees.

I’ve been reading that air travel is bad for global warming. People say our jets produce a huge amount of carbon dioxide and other greenhouse gases that increase global warming. An article I read recently said, “Flying is one of the most destructive things we can do.” This researcher concluded that “the only ethical option . . . is greatly to reduce the number of flights we take.”

But ethics are complicated: Don’t I have an ethical responsibility to my employees and stockholders—and to the 160 million customers who fly Delta every year, on more than 15,000 flights each day? And that means expanding air travel, advertising low fares, and trying to get people to take vacations to faraway places like Japan and China, to keep Delta profitable. Sure, we will try to pollute less, but we’ll leave global warming to the politicians and scientists to figure out. I’m a businessman. 🌐





1971

First international conference on climate change is held in Sweden. Scientists from 14 nations debate: Are greenhouse gases warming the world? Or is particulate pollution, like coal soot, shielding and thus cooling it? Some predict global warming will become self-reinforcing if polar ice melts, reducing the Earth's reflection of sunlight.

1970

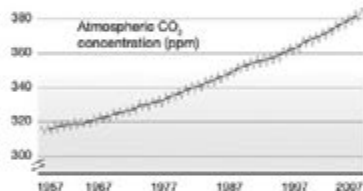
Environmentalists gather around the country to celebrate the first Earth Day, one of the largest demonstrations in U.S. history.

1965

At a meeting on causes of climate change in Boulder, Colo., scientists note the chaotic nature of the climate system and the possibility of sudden shifts.

1963

Congress passes the first Clean Air Act in the United States. Smokestacks are now subject to pollution controls.



1958

Atmospheric CO₂ concentrations reach 315 ppm. At Mauna Loa in Hawaii, Dr. Charles Keeling begins the first continuous long-term study of atmospheric CO₂ levels. He discovers that levels are rising and that the rate at which they are rising is increasing. This is known as the Keeling Curve.

CLEAN AIR ACT

1972

First U.N. conference on the environment is held. The United Nations Environment Programme is created. It will be the framework for international cooperation on environmental issues.

1979

The National Academy of Sciences issues its first major report on global warming: "We may not be given a warning until the CO₂ loading is such that an appreciable climate change is inevitable."

1985

Major international climate conference at Villach, Austria, warns that greenhouse gases will, "in the first half of the next century, cause a rise of global mean temperature that is greater than any in man's history." Scientists warn this could cause sea levels to rise by one meter.

1986

Atmospheric concentrations of CO₂ reach 350 ppm.

1988

NASA climate scientist James Hansen predicts rising sea levels and dangerous extreme weather by the end of the next century if fossil fuel consumption is not drastically reduced. The U.N. and the World Meteorological Organization create the Intergovernmental Panel on Climate Change (IPCC) to act as a clearinghouse on climate science.





1997

Kyoto Protocol is negotiated. Industrialized countries agree to reduce their collective greenhouse gas emissions to 5.2 percent below 1990 levels by 2012. The U.S. Senate refuses to ratify Kyoto.



1993

New data from analysis of Greenland's ice sheet shows that in the past, dramatic climate shifts happened rapidly—over the course of years, not centuries.

1992

At Rio Earth Summit, U.N. member states, including the United States, sign the UNFCCC, which promises to stabilize greenhouse gas emissions in time "to prevent dangerous anthropogenic [human-caused] climate change." But countries do not agree to specific targets for emission reductions.

1990

First IPCC Assessment Report is published, becoming the basis for the U.N. Framework Convention on Climate Change (UNFCCC).

1989

The oil, coal, auto, and electric industries create a front group called the Global Climate Coalition to promote the false science of "climate skeptics."

1998

Average global temperatures for this year are the warmest on record.

2000

Carbon dioxide increases to 369 parts per million.

2001

President George W. Bush renounces the Kyoto Protocol. Other nations carry on without the United States and continue to ratify the treaty. Third IPCC Assessment Report predicts a rapid and disruptive global warming unprecedented since the end of the last Ice Age: "Most of the warming observed over the last 50 years is attributable to human activities." Third warmest year on record.

2002

Larsen B Ice Shelf in Antarctica collapses.

2003

Lethal heat wave hits Europe. Hottest summer in 500 years kills 30,000–70,000 people. CO₂ levels reach 375 ppm.

2005

Kyoto treaty comes into effect and is eventually ratified by all major industrial nations except the United States. Work to reduce emissions accelerates in Japan, Western Europe, and some U.S. state and local governments. Hurricanes Katrina, Rita, and Wilma pound the Gulf Coast. Arctic sea ice reaches a record minimum; researchers warn that the sea could be ice-free in summer "well before the end of this century."

2006

CO₂ concentrations reach 381 parts per million.





Sources: The Nation; Field Notes from a Catastrophe; 350.org; American Institute of Physics; PBS Frontline; Alternet.org; Ecowatch.com

2009

In October, the grassroots group 350.org coordinates a worldwide day of action on climate change, in which tens of thousands of people in 181 countries demand radical action to reduce emissions. Largest civil disobedience action in U.S. history: 2,500 people blockade the gates of the Capitol Power Plant, which burns coal to provide heat to the U.S. Congress. Coal is the greatest contributor worldwide to carbon dioxide in the atmosphere. Copenhagen climate conference fails to negotiate binding agreements. Atmospheric CO₂ concentrations reach 390 ppm.

2008

The polar bear is put on the U.S. endangered species list because climate change is destroying its habitat. Britain passes a climate change bill mandating 80 percent reductions in emissions by 2050. Americans for Prosperity, funded by the Koch brothers, launch a "Hot Air" tour to oppose any regulation of carbon emissions. The tour's slogan is "Global Warming Alarmism: Lost Jobs, Higher Taxes, Less Freedom."

2007

IPCC Fourth Assessment Report sees possibility of abrupt and irreversible climate change. At a U.N. conference in Bali, governments agree to a timetable for negotiating a successor agreement to the Kyoto Protocol. Negotiations will conclude in Copenhagen, December 2009. The Supreme Court rules, in Massachusetts v. EPA, that the Environmental Protection Agency has the authority to regulate carbon dioxide emissions. Environmentalist Bill McKibben founds the climate action group, 350.org, recognizing that the atmosphere should not have concentrations of CO₂ exceeding 350 parts per million.

2012

Level of CO₂ in the atmosphere reaches 394 ppm. Texas and Louisiana require teachers to teach "both sides" of the climate change issue as valid scientific positions—that humans may or may not be responsible for changing the climate. NASA reports that nine of the 10 warmest years since 1880 have occurred since the year 2000. 350.org launches a Go Fossil Free: Divest from Fossil Fuels! campaign, urging colleges, universities, cities, religious institutions, and pension funds to withdraw investments from fossil fuel companies.

2013

May: Carbon dioxide concentrations in the atmosphere hit 400 ppm for the first time in human history. More than a thousand protesters are arrested at the White House in civil disobedience actions to demand that the Keystone XL pipeline from Canada to the Gulf of Mexico not be approved.

2014

In a public letter, 93 faculty members at Harvard University demand that the university get rid of all its investments in the fossil fuel industry. Demonstrations against the fossil fuel industry spread to colleges and universities throughout the country. In May, students are arrested at Washington University in St. Louis protesting the university's ties with Peabody Energy, a giant coal company.

September 21, 2014

An estimated 400,000 people marched through the streets of New York City for the People's Climate March. It was the largest environmental protest in history. Organizers declared: "We'll take to the streets to demand the world we know is within our reach: ... a world safe from the ravages of climate change; a world with good jobs, clean air and water, and healthy communities."



CHAPTER FOUR: **Burning the Future**



GLOBAL WARMING/GREEN PATRIOT POSTERS

“Black Waters”

By Jean Ritchie

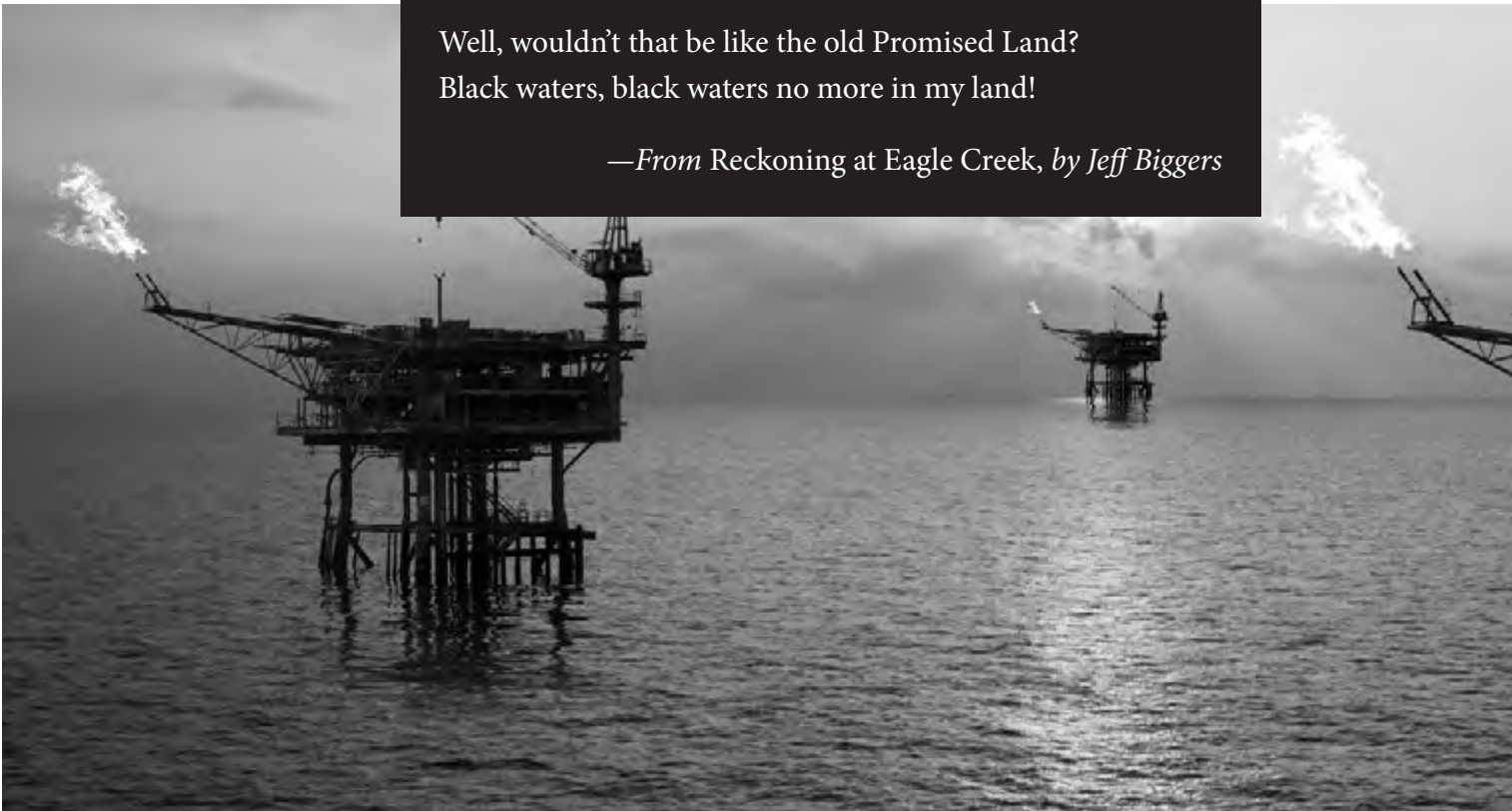
In the rising of the springtime we planted our corn,
In the ending of the springtime we buried a son,
In summer come a nice man, said, “Everything’s fine—
My employer just requires a way to his mine”—
Then they threw down my mountain and covered my corn,
And the grave on the hillside’s a mile deeper down,
And the man stands and talks with his hat in his hand
As the poisonous water spreads over my land.

Sad scenes of destruction on every hand;
Black waters, black waters run down through the land.

Well, I ain’t got no money and not much of a home;
I own my own land, but my land’s not my own.
But if I had ten million—someday thereabouts—
I would buy Perry County and I’d run ‘em all out!
Set down on the bank with my bait in my can,
And just watch the clear waters run down through my land!

Well, wouldn’t that be like the old Promised Land?
Black waters, black waters no more in my land!

—*From Reckoning at Eagle Creek, by Jeff Biggers*



INTRODUCTION

Burning the Future

The title of this chapter, “Burning the Future,” is borrowed from a film of the same name, about coal and mountaintop removal mining in Appalachia. It has a metaphorical ring, but it’s no metaphor—it’s literally true: We are burning the future.

This chapter deals with the overall issue of fossil fuels and then is divided into three sections: coal (p. 198), oil (p. 230), and natural gas and fracking (p. 247).

The chapter is an invitation to teachers not only to teach about fossil fuels, but also to teach against fossil fuels. No doubt, this sounds partisan, and it is. But an anti-fossil fuels curriculum is based on science: 80 percent of known reserves of coal, oil, and natural gas need to stay in the ground if we are to avoid a climate catastrophe.



According to the latest report of the Intergovernmental Panel on Climate Change, the atmosphere has a ceiling of about 1 trillion tons of carbon, to preserve a reasonable hope of keeping climate change to a 2 degrees Celsius (3.6° Fahrenheit) increase over preindustrial times. The problem is we’ve already deposited well over 500 billion tons of carbon in the atmosphere, and at the rate humanity is burning fossil fuels, we’ll reach the trillion-ton limit around 2040. In 2013 alone, we released 36 billion tons of carbon into the atmosphere.

We use the “we” voice here, and the collective term “humanity,” but, as we emphasize in this chapter and throughout the book, a vast inequality exists between the carbon dumpers and those who suffer from the dumping. The same holds true for fossil fuels extraction. The coal companies clearcut forests, shove mountaintops into streams, and then call it an “act of God” when floods devastate communities. But activists like Maria Gunnoe know better: “I didn’t see God up there in those haul trucks, filling in the creeks.” (See “They Can Bury Me in These Hills, but I Ain’t Leavin’” p. 210.) Those who order the land’s blasting and scraping live at a comfortable distance from the victims of their decisions.

Fossil fuels do not just burn the future. They wreak havoc on the air we breathe, the water we drink, the oceans we depend on, our bodies’ chemistry, and the democracy we need. This may be a grim future we confront, but the way students learn about these dynamics needn’t be deadening. This chapter features mysteries, role plays, simulations, games, mixers, storytelling, poetry, and imaginative writing. Implicit in all these activities is the promise that people can make sense of what is happening around us, and we can take action on behalf of a different future. And, without minimizing the dangers we face, we can have fun doing it.

Yes, we are burning the future. But nothing is inevitable. This is a key lesson from history, and—we hope—from the activities included in this chapter. 🌍

CHAPTER FIVE: **Teaching in a Toxic World**



ALEC DUNN



CARRIE NEUMAYER

“Underlying all of these problems of introducing contamination into our world is the question of moral responsibility. . . . [T]he threat is infinitely greater to the generations unborn; to those who have no voice in the decisions of today, and that fact alone makes our responsibility a heavy one.”

—Rachel Carson

INTRODUCTION

Teaching in a Toxic World

Toxic trespass. It's a term used by biologist, writer, activist, mother, and cancer survivor Sandra Steingraber. And it describes what this chapter is about.

In an interview with Bill Moyers, Steingraber defined it simply: Toxic trespass is “when chemicals without our consent enter our body...” And what could be a more intimate invasion? Invisible, uninvited, and often deadly.

Articles in this chapter describe how toxic trespass happens in far too many ways in our lives—here and around the world. It happens in the small particulate matter we breathe (“Science for the People”), the cosmetics we apply to our bodies (“Combating Nail Salon Toxics” and *The Story of Cosmetics*), the water we drink (“The Transparency of Water”), and the radioactive dust we inhale (“Uranium Mining, Native Resistance, and the Greener Path”).

Toxic trespass happens to all of us—but, as we've shown throughout the book, not equally. Linda Christensen and Kevin Sullivan (“Reading Chilpancingo” and “Toxic Legacy on the Mexican Border”) describe the damaging toxic stew that U.S.-owned factories pour into a poor Tijuana, Mexico barrio. Corporations repatriate enormous profits while children in Chilpancingo play in streams that run red then white then black in effluent emitted by maquiladoras on the mesa above. And those lightly regulated, poisonous nail salons? They're staffed almost entirely by immigrant women of color. And it was Navajo men who trudged home from uranium mines covered in radioactive dust with which they unknowingly poisoned their families—families that still today breathe contaminated dust from abandoned uranium mines and drink mining-tainted water.

Because of the intimate nature of the toxic trespass, students' first reaction may be self-protection or focusing on individual consumer choices, rather than collective action. This is an impulse corporations are all too happy to reinforce. For example,

Elizabeth Royte describes the Keep America Beautiful campaign; the same corporations fighting pollution regulations and recycling requirements were the ones spending millions on advertisements like the so-called Crying Indian campaign that blamed pollution on litterbugs and thoughtless individuals. The chapter's opening article by Derrick Jensen, “Forget Shorter Showers,” is a provocative one that directly challenges all of us to think beyond our individual actions. What sane person would suggest that composting would have ended slavery? Jensen asks. So why do some think that we can address the environmental crisis through personal lifestyle choices?

This chapter provides abundant evidence that people are taking collective action: Tony Marks-Block's students in Oakland investigating sources of airborne particulate matter and publicly sharing their results; Yukiko Kamea and other Fukushima refugees demanding an end to nuclear power in Japan; Lourdes Lujan and women's environmental justice activists organizing for a cleanup of a toxic landfill in Tijuana; and the indigenous activists Winona LaDuke describes who are building the “greener path.”

In Bill Moyers' interview with Sandra Steingraber, she echoes the sensibility of this chapter:

And so at this point in our history, it is the environmental crisis that is the great moral crisis of our age. And in that, I don't want to be a good German...I want to be one of the French resistance. One of the people who stand up and say, “This is not right. No matter how difficult this is to change, we're going to have to change it.” 🌍

CHAPTER SIX:

Food, Farming, and the Earth



MEREDITH STERN

“Peasant-led agroecology is the real solution to global hunger. Not only do peasant farmers feed communities, they also cool the planet and protect Mother Nature. Unlike agribusiness, peasants do not treat food as a commodity for speculation profiting out of hunger. They do not patent nature for profit, keeping it out of the hands of the common man and woman. They share their knowledge and seeds, so everyone can have food to eat... La Vía Campesina reminds society and governments that if we really want to put an end to hunger, then we must accept the central role of the peasants, and support them to feed humanity.”

—La Vía Campesina



PETE RAILAND/JUSTSEEDS.ORG

INTRODUCTION

Food, Farming, and the Earth

We start the book with the motto “everything is connected,” and we finish on the same note. Food embodies many of the ecological problems and social injustices highlighted throughout the book. And similarly, it calls out for activism that recognizes the interconnectedness of these issues. The global industrial food system holds an inherent contradiction: It is a major source of global warming pollution, and at the same time it is threatened by increasing climate chaos. This same food system currently leaves close to 1 billion people hungry, not for a lack of food production or “overpopulation”—as many textbooks tell students—but because the global market privileges the profits of multinational corporations over the human right to food.

Although Christian Parenti’s article, “Reading the World in a Loaf of Bread,” shows up in the first chapter of this book, it occupies a symbolic place in this chapter as well: The Arab Spring revolts several years ago were sparked by record food prices, largely caused by the worst droughts in a century. Global climate change, global capitalism, and the constant struggle of people to maintain power and control over their lives (especially food) are all intricately woven together—and it’s only by turning a blind eye to increasing global inequalities that we continue to treat these in the curriculum as different subjects.

Food embodies the connections among the problems we face, and it also represents the connections linking the solutions we must work toward. The La Vía Campesina role play in this chapter, based on the global social movement of 200 million peasant farmers, offers one of the best examples of how a deep response to the food crisis is also, necessarily, a deep response to the connected crises of the climate, global inequality, forced migration, and public health, among others. It’s immensely hopeful to see how the farmers of La Vía Campesina, situated around the world, are fighting against the corporate food system that has wreaked havoc across the

global countryside. The farmers are creating “food sovereignty” through local seed banks, co-operative farm schools, mass land occupations, and direct pressure on national and international food policy makers.

Finally, examples like La Vía Campesina could be lost on students unless we help them recognize the power they possess to effect change in the current food system. In “Food Secrets,” Michi Thacker walks her students through the seemingly simple exercise of researching where their food comes from—only to discover that food corporations seem happier to take our money than our questions. This secrecy protects the corporations from public scrutiny: Once we start to inquire about the source of our food, we are likely to ask more questions about how it is grown, by whom, and under what conditions. And the inevitable conclusion, in the words of the farmer, poet, and philosopher Wendell Berry, is that “how we eat determines, to a considerable extent, how the world is used.” 🌍



STEPHANIE McMILLAN

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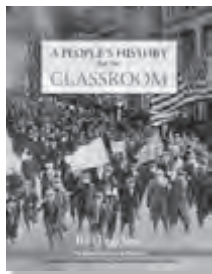
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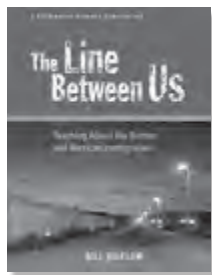
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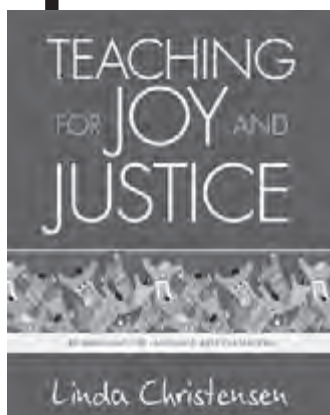
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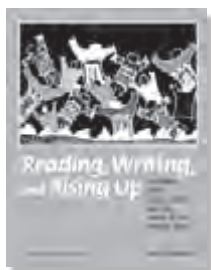
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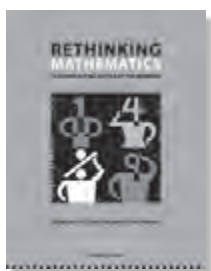
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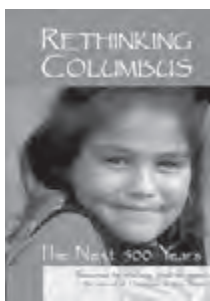
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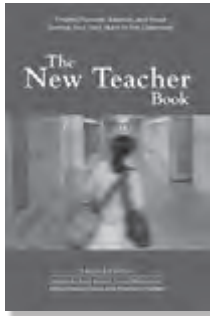
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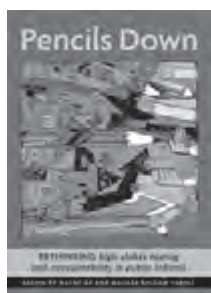
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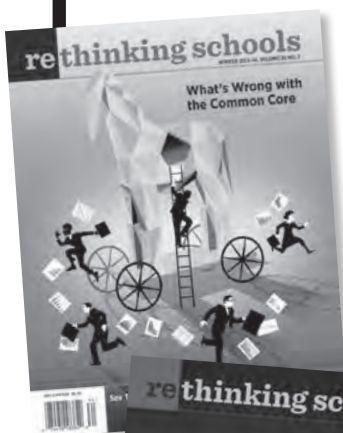
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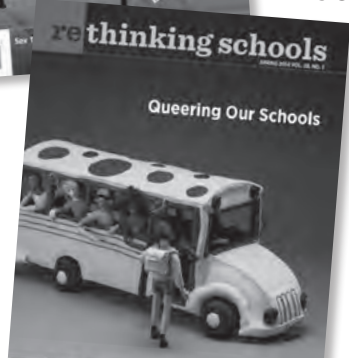
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