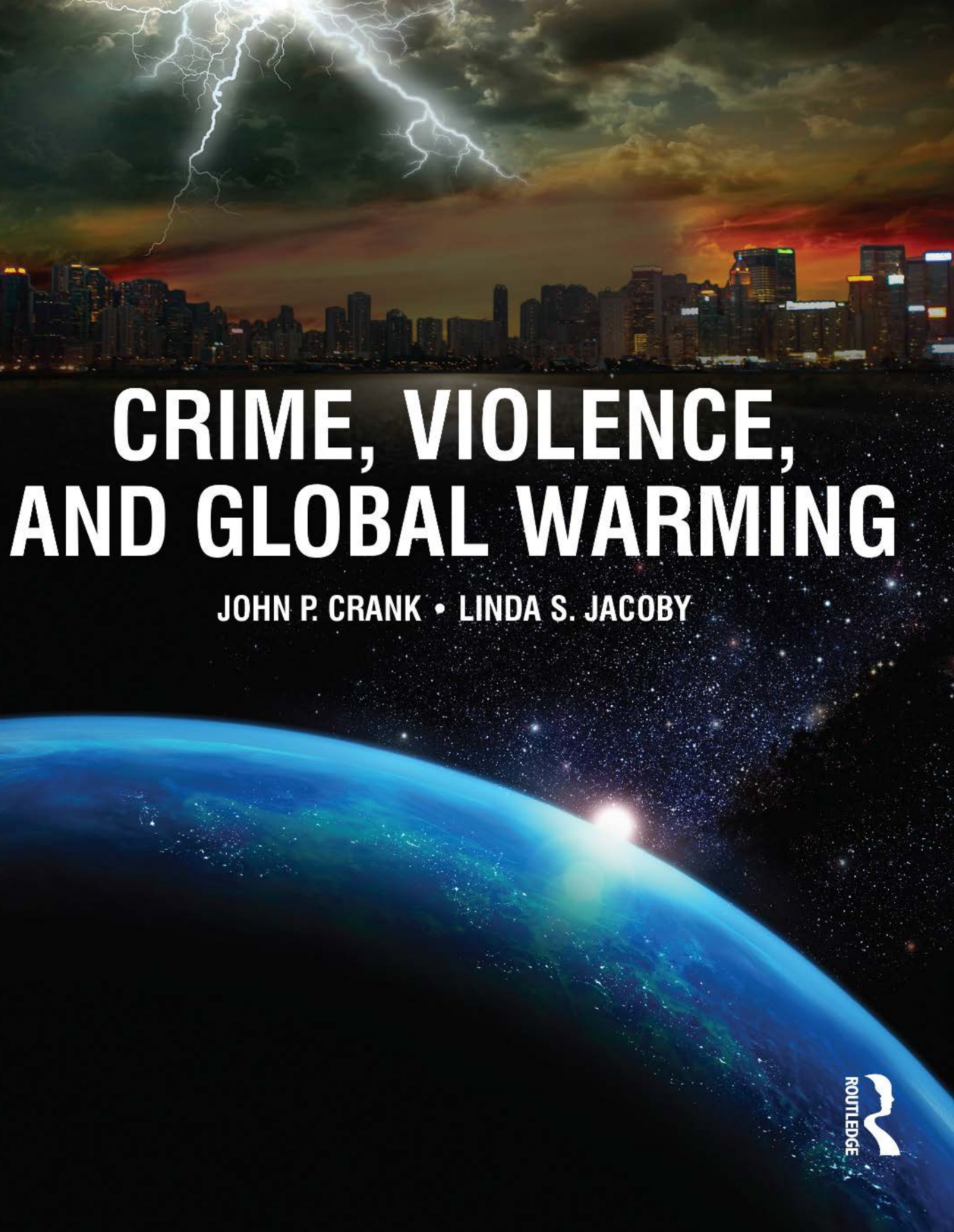


The background of the book cover is a composite image. The top half shows a city skyline at night with a large, bright lightning bolt striking down from a dark, stormy sky. The bottom half shows a view of the Earth's horizon from space, with a bright sun or star rising over the blue curve of the planet against a starry background.

CRIME, VIOLENCE, AND GLOBAL WARMING

JOHN P. CRANK • LINDA S. JACOBY

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JOHN P. CRANK
LINDA S. JACOBY

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INTRODUCTION

This book is about global warming and its climatic impacts on violence and crime. It is highly interpretive and inferential in our effort to peer beyond present “knowns” in anticipation of future risks. The authors faced three central challenges writing this book: (1) accurately depicting current global social and physical characteristics, (2) assessing how those characteristics will change in the future, and (3) evaluating how climatic changes will interact with those futures. This challenge is redoubled by the recognition that the present knowns are themselves often controversial. This book is consequently summative, providing our estimation of central tendencies on these topics.

Our goal is to provide important topics of discussion for policy makers, social scientists, and political leadership at all levels of governance. We also want to inform the readers of the sheer diversity of the risks, including a broad array of some quite bad outcomes, perpetuated by climate change. Any statement of risk should carry the recognition that any hypothetical climate change “outcome” is itself transitional; at this point it is not clear whether sharp curtailment of greenhouse gases will significantly slow climate change if—a very important if—major climate-induced feedbacks start kicking in. We make use of a large body of political science, criminology, earth sciences, and hydrology research to present our discussions.

This book is not intended to be politically balanced, seeking the middle ground between different rhetorical talking points of climate change and consequently inferring that different positions are somehow balanced scientifically. Indeed, one of our concerns is that efforts to find political middle ground, particularly in the form of popular media presentations, fundamentally mislead the public on a topic almost absent scientific disagreement. To draw a parallel, it is as if the field of celestial mechanics were in continued political debate and Sunday talk show controversy about whether the Earth indeed rotates around the Sun. Global warming, as Bill Nye observed, is a political controversy, not a scientific one.¹ Like the notion of human evolution, also still controversial among a large percentage of the American electorate, global warming is widely accepted in the relevant sciences. It is different from human evolution in one important way, though: Evolution reaches deeply into our past. Global warming reaches deeply into our future.

A review of the science on global warming reveals clear patterns that are taking place globally and regionally, having effects that are already well underway and already playing havoc with ecological systems. The way humans live on this planet represents a subgroup of those ecological systems, and many countries, including the US, are already experiencing impacts from warming, acknowledged or not, desired or not, and politically correct or not.

It is apparent to us that political action on climate change has not come soon enough, a view grounded in our observations of legislative resistance to prevention and planning in the face of this gathering global catastrophe. We live in an age not unlike the Renaissance, where scientific findings are adjudicated by political authority and where influential political sovereigns, backed by powerful lobbies and moneyed interests in the energy marketplace, deny the legitimacy of global warming science. It is time to prepare for a future in which our fundamental ecological relationship with the world will change. Our social compacts and nation-state structures will be altered. We should anticipate a rough ride on the way to a different world, and on arrival, a world that likely will have turned hostile to the humans that occupy it. The world our grandparents knew is over, we live in its waning shadow.

The image this book presents is one in which our future faces several potentially catastrophic risks. Security issues will be a central concern over the next 50 years, whether security is perceived in state-centric or population-centric terms. Consider the major security groupings. Intrastate security is provided by highly decentralized municipal police and, at a federal level, by national police entities. Nation-state security is provided by their militaries and bolstered by treaty and commercial interlinks. International security is provided by different international police forces, often with ties to the United Nations. Peacekeeping aims to provide external security to failed and failing states. Finally, counterinsurgency and counterterrorism is a specialized security function aimed at significant threats from small groups widely dispersed globally. These entities will need to move beyond a weakened nation-state system in the future and develop international linkages, even while bridging their own differences so that they can act effectively for the common good of citizens.

The movement of crime and security issues to the front and center of international and national policy, we think, will flow from fundamental changes in the environment of crime and violence. Powerful individual criminals with rudimentary organization, international organized crime entities, and insurgents and

terrorists have undergone a fundamental change over the past 20 years and today are often conjoined, working together for common goals. Operating as unstructured, leaderless, yet highly lethal ghost presences in many countries, they seem to be undefeatable. Even in countries such as the relatively secure United States, gangs exist in all major cities and are extensively interpenetrated by international criminal groups. Importantly, global warming factors, even while undermining important state security mechanisms, play to the strength of the criminal environment. The impact of climate change on international security is likely to be substantial, with outcomes for nation-state stability and security becoming increasingly unfavorable.

This book conveys the spirit of preparedness. It is, essentially, a risk assessment of global warming from a crime and security perspective. We ask—what are the implications of global warming and what do we need to keep in mind as the planet warms? How do we prepare for battle against an enemy who seems from our limited historical perspectives to move with glacial pace, but whose strength is unassailable, whose presence is ubiquitous, and who will leave nothing on this planet untouched?

Pessimism is difficult to resist. Consider the news on no particular day—the “no particular day” below being November 20, 2012; the reader could find similar accounts on almost any other day. As we scanned the papers for information about global warming, three newsworthy items stood out. When all three are considered together, it is difficult to be optimistic and distinctly challenging even to be hopeful.

The first column below is a discussion of the growing recognition, according to its authors, that significant global warming cannot at this point in time be stopped.² The column noted that

The latest report, released Wednesday by the United Nations Environment Program, suggested that greenhouse gas emissions levels are currently around 14 percent above where they need to be by the end of the decade in order to avoid what many analysts believe could be a risky level of planetary warming.

“These billions of tonnes of additional carbon dioxide in our atmosphere will remain there for centuries, causing our planet to warm further and impacting on all aspects of life on earth,” said WMO Secretary-General Michel Jarraud, in a statement issued Tuesday. “Future emissions will only compound the situation.”

On Sunday, the World Bank issued a report suggesting that the climate could warm a full 4 degrees by the end of the century—less than 90 years from now—even if countries fulfill the modest emissions-reduction pledges they’ve already made.

A 4-degree uptick in temperatures is significantly higher than what has long been deemed the maximum amount—2 degrees Celsius, or 3.6 degrees Fahrenheit—that average global temperatures could rise while still maintaining a climate similar to that in which human civilization has evolved.

Researchers have emphasized that the quantity of fossil fuels that are released into the air needs to be curtailed significantly and immediately, otherwise global warming will have catastrophic consequences.³ Yet, it appears that we are going in the opposite direction: ramping up our use of fossil fuels to address energy issues in the face of population growth, economic progress, and the task of survival in a warmer world. The next article discusses a broad international effort to sharply increase the numbers of coal-burning plants worldwide.⁴

“Global Coal Risk Assessment: Data Analysis and Market Research,” released on November 20, estimated there are currently 1,199 proposed coal plants in 59 countries. They noted that China and India together account for 76% of these plants. The United States landed seventh, with 36 proposed coal-fired power plants.

WRI’s [World Resources Institute’s] Ailun Yang noted, “If all of these projects are built, it would add new coal power capacity that is almost four times the current capacity of all coal-fired plants in the United States.”

According to WRI, “Coal-fired power plants are the largest contributor to the greenhouse gas emissions that cause climate change.” The WRI analysis, conducted in July 2012, comes as environmentalists warn that an estimated 80% of the world’s proven oil, coal and natural gas reserves must remain in the ground, unburned, to avoid the release of enough carbon dioxide to warm the planet above the internationally agreed upon limit of two degrees Celsius.

The goal of increased energy from fossil fuels to meet growing needs contradicts the need to curtail fossil fuels to mitigate global warming. Yet, the expansion of energy demands is occurring in the face of recognized, extraordinarily high levels of greenhouse gases worldwide. The third article noted that, once again, the level of carbon dioxide emissions reached a new high in the world.⁵ In other words, in spite of the substantial evidence showing continued increases in greenhouse gases, we continue to seek short solutions that will make the problem worse in the long-term.

GENEVA, Nov 20 (Reuters) – Atmospheric volumes of greenhouse gases blamed for climate change hit a new record in 2011, the World Meteorological Organization (WMO) said in its annual Greenhouse Gas Bulletin on Tuesday.

The volume of carbon dioxide, the primary greenhouse gas emitted by human activities, grew at a similar rate to the previous decade and reached 390.9 parts per million (ppm), 40% above the pre-industrial level, the survey said.

It has increased by an average of 2 ppm for the past 10 years.

WMO Secretary-General Michel Jarraud said the billions of tonnes of extra carbon dioxide would stay in the atmosphere for centuries, causing the planet to warm further.

Levels of methane, another long-lived greenhouse gas, have risen steadily for the past three years after levelling off for about seven years. The reasons for that evening out are unclear.

Growth in volumes of a third gas, nitrous oxide, quickened in 2011.

It has a long-term climate impact that is 298 times greater than carbon dioxide.

These kinds of stories are ordinary fare for news readers, who have likely read many such stories and who may be jaded to the topic. After all, global warming does not leave an obvious signature on catastrophes. It takes a scientist to ferret out global warming effects. The public, under a relentless torrent of politically empowered, media-reinforced global warming “contrarianism,” does not grasp the magnitude or significance of the changes coming in our future. Indeed, the interpretation of the three articles, when read in sequence, is that increases in climate changing gases are not only high but increasing in a nonlinear way, that the evidence of global warming is substantial, and that, globally, we are getting ready to ramp up the production of plants that will yield substantial additional quantities of greenhouse gases. We are going in the wrong direction, barreling toward a catastrophe of our own doing.

This book is challenging for a variety of reasons. First is that many different kinds of knowledge are required to write this book. One of the difficulties with writing about global warming is trying to decide what to leave out—Climate change in some way affects practically everything. Consequently, some topics will not and cannot receive the attention they need in a relatively short book. We apologize in advance to those who have extensive expertise in some of the fields we address with too much brevity and generality.

Second, the future is, by its nature, unwritten. We don't know with certainty what will happen. Any discussion of events in the future is a tactical guess, extrapolating on current trends. Global warming is typically assessed in two ways: through modeling and through examination of prehistorical times. Inevitably, some modeling extrapolations will be wrong. Anyone who has used complex modeling techniques, even those that seem to fit historical data very well, has discovered the enormous difficulty in moving from description to prediction. Sometimes very good historical models fall apart when used to predict events. Information that predates history, though helpful, is nevertheless marked with extensive periods of unconformity from erosional processes; information may simply be unavailable. Prehistorical analyses, however, clearly show strong and clear correlations between the quantity of greenhouse gases in the atmosphere and global temperature. The challenge is not whether global warming is happening; scientifically that debate has been over for 20 years. The challenge lies in determining exactly how sensitive the climate is to CO₂ in the atmosphere.

Consequently, our goal is not to predict the future. It is to foster critical conversation as we move into unknown times and to begin to think about what is going to happen to us. If our most important state concern is to protect our citizens from risks, then we need to take into account those risks associated with global warming. This applies to businesses such as insurance, it applies to urban planning and state and county code development, and it applies to national security. Indeed, it applies to anyone who has a fiscal or budgetary responsibility to develop long-term plans to protect citizens, governments, and businesses from risks.

It should be noted that fiscal planning is not about futures already scripted, it is about future contingencies in light of possible negative outcomes. Good planners always ask "What of this?" and "What of that?" These are the sorts of questions we raise herein. We do not intend to be environmentally deterministic: Human will and creativity cannot be discounted. But, at this point, there is more than enough science about global warming to indicate the need for precautionary planning and mitigative action. With the substantial knowledge we have already amassed, to fail to act can only be described as reckless.

Third, to describe any futuristic trajectories, we must begin with a concrete and realistic description of the present and then try to figure out where we are going even without global warming figured into the mix. This is a substantial challenge because we have no particularly good reason to believe that the predominant social and political relationships that characterize the world today

will similarly characterize them in the future. Many observers argue the contrary: that the future will be quite different, with or without global warming figured into the mix.

Where do our trajectories into the short-term future take us? The future moving rapidly toward us is one that has been described in terms of megacities and megadeltas populated by tens of thousands of slums housing billions of people, the emergence of feral cities, the expansion of failing states and the new dark ages, compounded by a 50% increase in the number of humans on the planet. This, some of the more astute observers of our times believe, is the human spatial and social ecology that will be us by 2050, even without global warming added. Some of the notions—the emergence of stateless, feral cities, is a bit of a reach though a true risk; others like the vast urbanization of the planet into huge favelas of poverty is inevitable and is already well underway. Mix global warming into the 2050 spatial distribution of humans on planet Earth and we begin to realize the extent to which we are in deep trouble. The future trajectories described by some of our most cogent observers take us to a collision between global warming and the largest migration of humans in history sometime around midcentury; the path through the collision is unclear, the territory on the far side of the collision is hostile, dark, and forbidding. We can no longer avoid that collision; the moment has passed. Now is the time to prepare and mitigate as best we can.

Fourth, and closely related to three, global warming is likely to have detrimental impacts on critical functional systems, especially those associated with hydrology that are already under regional stresses of one kind or other. When we talk about critical functional systems we mean both human and natural processes that are seen as essential for human well-being in specific locales. Some of those system stresses are substantial.

For instance, consider a forecast for the Great Plains area in the United States; it is anticipated that the area will have lower rates of rainfall and that what rain it receives will be in the form of less frequent but more intense storms. The American West faces the loss of snowpack that makes up the great natural reservoirs of the Rockies. That snowpack is essential for both East and West of the Rockies and contributes much of the water to the rivers that cross the plains toward the Midwest. Regional droughts will become more commonplace. It has been fancifully suggested that the era of the buffalo will return as the Great Plains become unfit for farming and ranching, and plains residents finally complete the already advanced depopulation of the area.⁶ Agriculturally, this area is already under water stress. Its primary water source

for ranching and farming across the region is the Ogallala aquifer. This fossil aquifer is overused across most of its substantial geography and is anticipated to be functionally depleted by the mid-point of the century.

Hence, we see a twin blow to the region: one coming from the overuse and misuse of the Ogallala, and one from global warming. The Great Plains will dry further, and its principal rivers may well run dry as the snowpack from the Rockies steadily diminishes over time. It faces the clear threat of desertification, and it faces that threat sooner rather than later. It is a region that, from mismanagement of critical water supplies, growing water needs, and global warming, is threatened with becoming altogether unusable as ranch or farmland. It is not suitable for dry farming; without a plentiful supply of groundwater agriculture, as it is now, it will be devastated. The Ogallala is not unique in this respect. Many of the major aquifers around the world are heavily stressed, and most face a similar fate. Some, like the principal aquifer under the megacity Mexico City, are already ruined.

Fifth, we must deal with a concept of crime and violence that is inconsistent with the way Western societies do the work of crime and justice. Western crime control institutions are organized around the idea that crimes are caused by human misbehavior, and they invest substantial financial and human resources into holding people punitively accountable when they misbehave. In this book, we take a sharply different tack: crimes and violence are to be attributed not to motive-driven people, but to nonmotive-propelled, nonaccountable things. Human agency—the idea that people control their decisional processes—is seen as an intervening variable, subject to the whims of earth-based physics. Temperature, for instance, is associated with higher levels of violence. More intense storms are linked to higher levels of homicides and violent crimes under some circumstances and fewer homicides and violent crimes under others. Pathogens are tied to state security failure. We think of this approach as a “big picture” approach to crime and violence. It is concerned with larger criminogenic processes, where broad contextual factors are assessed for their exogenous role in crime and violence. In the parlance of research, this is a macrosocial approach. The microsocial approach is helpful for understanding the details of a specific event, but only the macrosocial can provide the perspective that actually explains an event in a way that is policy-solvable on the scale global warming is affecting us. That is the approach we take herein, and this allows us to look at how things, not people—in this case, environmental changes in human social and geographic ecologies—are associated with crime, violence, and security.

The macrosocial approach also carries an important element not available from the microsocial perspective. If we look at a crime from a microsocial perspective, we can focus on the individual who carries out the crime and their immediate contexts, and pretty much leave it at that. However, from a macrosocial perspective, we find that people alone cannot account for crime patterns—other factors seem to be closely related to crime prevalence and likelihood.

This approach seems warranted when we look at the last 30 years of get-tough laws aimed at dealing with crime at the most immediate level—the offender. In the contemporary vernacular, we have learned over the past 30 years of intensified punishment and prisonization—in which the United States has amassed to the largest ratio of prisoners to citizens in the world—that we cannot arrest our way out of crime. Consequently, looking at broader contextual features is not only good from the perspective of studying global warming, it may be the best way forward for addressing crime generally.

Put more to the point, the microsocial approach takes us, as ordinary law-abiding citizens, off the hook by letting us blame some poor wretch for the crime she or he committed. The macrosocial approach puts us back on the hook—it is not only someone else who is at fault. We are implicated as well and a piece of the responsibility is ours. This is actually a stronger and more optimistic approach to crime control, though. If we are somehow involved in the problem, then it is within our power to fix it. So it is with global warming; for all the prophetic doom and gloom, the point of broad risk-oriented perspectives such as those embodied in this book is to try to anticipate and forestall the most severe downsides, however dark and dire they might be. At this point, we can likely no longer stop a three degree Celsius global warming and significant ocean rise; the tipping point is past, the window closed. But we can prepare, and we can try to mitigate additional, far more troubling outcomes that would occur with warming in the four degree plus Celsius range at the end of this or any century.

This book uses an interplay between two fictional characters—Clete, and Gran'ma Ruth Willis to present the future fresco with which global warming presents us. Clete, arriving at a bar named “The Apocalypse,” is carrying out an oral history project in which he is attempting to understand the first century of global warming. The ideas for their conversations are derived from the book *Six Degrees: Our Future on a Hotter Planet* (Lynas, 2008), which describes the effects on the planet for each degree Celsius of heating. We chose that book because it is based on a reasonable

organizing perspective of the available science and because it represents the global climatic impacts through the dawn of the twenty-second century that will occur if we essentially do nothing. It is a catastrophic forecast, as are most thorough and honest books about the long-term futures of global warming. And, thus far, what has been accomplished to stop the machinery that drives global warming is precisely nothing. We will use the oral history as a literary convenience to describe the impact of each degree of temperature change as the Earth warms through the century. Each chapter begins with an excerpt or discussion involving Clete and Ruth. The discussion is followed by a substantive review of literature and scientific research related to the topic they discuss.

Endnotes

1. "When people call these 'controversial topics,' that's misleading," he continued. "They are only controversial politically. And politics is not necessarily evidence-based." "Firebrand for science, and big man on campus: On TV and the lecture circuit, Bill Nye aims to change the world." Retrieved November 2, 2013 at <http://www.nytimes.com/2013/06/18/science/bill-nye-firebrand-for-science-is-a-big-man-on-campus.html>.
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PROLOGUE: WELCOME TO THE APOCALYPSE

As noted in the Introduction, each chapter in this book begins with an excerpt or discussion involving Clete and Ruth.

Clete pulled up to the Apocalypse. It was rumored to be the longest-running bar in this part of the country. There was a big sign, warped and corroded, on which was written, “Welcome to the Apocalypse: Best Biker Bar in the World.” Clete had been told that it was built back in 2020 and hadn’t gone a day since without whisky being poured. It was founded by a scientist, Roberto (Beto) O’Hanohan-Ruiz, one of those multidisciplinary wizards who figured out what climate change *really meant* and one of the few to survive the purge unscathed.

The purge was a bad time. It began in Canada, with the burning of all library research pertaining to global warming.¹ It ended with the persecution of a number of global warming scientists in many countries and not a few lynchings—people always seemed to blame the messenger. The rest went underground. O’Hanohan saw it all coming, not just to the planet, but to its residents, human and nonhuman alike. They were in trouble deep. Then he looked at how the countries of the world were preparing for climate change. Then they say that one morning he walked out of his university office, locked the door, bought a Harley bagger, and disappeared. He showed up about 5 years later in this forlorn place, bought the bar, named it the Apocalypse, and added a grocery and hotel when people started migrating North to Canada. Yep, Clete thought, he understood people all right.

Clete had heard about an older woman there, Ruth Willis. “Gran’má Willis” they called her. She had been around a long time, and she had traveled with O’Hanohan when she was younger. She was in her nineties, so she was around at the end of *the good time*. Clete was working on a living history project, piecing together the information about the Great Dust Desert back when it was known as the Great Plains, tracing it from *the good time* through the *great warming*. He stopped himself—we’re not *through* the great warming, he reminded himself. We’re *in* the great warming. He had talked to her a few times and now had the opportunity to interview her in person, in the place where her story took place. He needed to get Ruth’s story.

People said that the Midwest and Great Plains were beautiful in the early 2000s, that the towns were friendly and everyone got along with everyone else. There were rivers across the Great Plains and a lot of water underground. He looked across the plains and saw only a dirt desert under a big blue sky. There was a pile of old bones off to the east,

probably the last vestiges of a cattle shoot. There were antelope still and wild horses. Further south in the high country, the javelina were prospering; their numbers were growing and they were increasingly dangerous to people. They could take down a big cat, quickly. The coywolves were populating the high desert; they were pack hunters with no fear of people. Too smart to trap. Dangerous country, after the weather knocked you down, the animals would move in and pick your bones.

Clete was working on an international project at the University of Winnipeg. Winnipeg, like many cities in Canada, had undergone tremendous growth over the past half century and was itself approaching megacity status at 8 million. It sat on the edge of the Great Dust Desert but was remarkably verdant, and the temperatures were mild even into the rainy season. As the ambient crop-growing temperatures and rainfall marched steadily northward during the twenty-first century, Canada had become the one of the world's great breadbaskets. It had been hard work; at first, in the early days of *the great warming*, much of Canada was just a swampy, rocky thin-soiled wetland. Major hydrological and earth-moving projects had made the land suitable for farming and ranching on a large scale; now it was a primary food source for the megacities of the world, second only to Siberia. Winnipeg had consequently received a lot of immigration from the United States, especially from the Great Dust Desert, before they closed the border.

The desert itself was remarkable, like a living, growing thing, Clete thought. It had mostly swallowed the Great Plains and intermountain West, and was now reaching its tendrils into the Midwest, down into the thin-soiled Little Egypt area of Illinois, swallowing St. Louis, Kansas City, and Omaha. It was semiarid all the way through southern Indiana. Clete's grandparents, themselves from St. Louis, had moved ahead of the desert and relocated to Calgary in 2060. Now Clete found himself on the native soil of his grandparents, though he had never before visited it nor wanted to.

Clete was working on Midwest US oral history. His part of the project was to create a living history of the Great Plains before it was the Great Dust Desert. There was little knowledge that remained of the way ordinary people lived in that part of the country in *the good time*, and their traditions and cultures had largely disappeared. It was as if a civilization had vanished, leaving barbed wire and shotgun shell casings behind. His goal was to interview people who remembered what it was like in *the good time*, back when the United States was the place people were trying to *get to*, not *escape from*. He suspected that Gran'ma Willis was one of the few remaining people who still remembered *the good time*. The interview was a wonderful opportunity to understand a past increasingly different and unreachable.

Dust seemed to hang in the air, and there was darkness off to the West. Looked like another ripper was coming, he thought. They said that sometimes the dust storms were so bad you could choke to death. Your nose and mouth would turn black and your lungs would fill up. You would suffocate, like a bloated dead buffalo. You'd get buried alive and no one would find you. The storms could be nasty down here in the United States. They could last for two to three days. He was glad they

didn't have them in Winnipeg. A bad storm, a real ripper, could gather its energy in Colorado and carry dust all the way to Chicago. Dust could even find its way to Manhattan Bay.

He got off his bike and went inside. The bike was 250 ccs, the legal limit, and provided him with good gas mileage at 60 miles to the gallon. The Apocalypse was pretty rough as bars go. The grocery, a small room on the left, was full of the usual products: a shelf for bottled water, one for hard liquor, one for toiletries, and one for canned goods. There was a locker for a few frozen goods.

The Apocalypse had a large center room with tables for gamblers and a bar to one side. There was a motel next door, with a closed sign on it and plywood covering the windows. At one time, it had done a thriving business as an overnight stop for people leaving the United States, but the migration stream had dried up. There was no one in these parts left to move.

He saw Gran'ma Willis sitting at one of the back tables. He recognized her immediately. They had previously met by *wallview*, the soft plasma folding screens that used smart-pixels to create life-sized images and could be unfolded and stretched across an entire wall. They were so realistic that a person could almost forget that the person they were talking to was a thousand miles away, especially with the microphone sensors built into the screen that followed the person around and captured and delivered the ambient background sound in multistereo. He walked back to where she was seated.

Clete. "Ms. Willis, I'm delighted to finally meet you for real at last."

Ruth. "Oh, don't call me Ms. Call me Gran'ma like everyone else. Sit down. You came down a long way to talk to me. How'd you afford the gas?"

Clete. "Scholarship. I got a gas stipend." Clete was proud of that. Very few students received gas scholarships, so almost all of them bicycled. Gas was crazy expensive at \$5,000 dollars a gallon, and only purchasable with a government permit.

He smiled and looked across the table at her. "Do you actually remember much of *the good time*?"

Ruth. "Oh yea, I still remember all that stuff. I was pretty young, and the really crazy stuff didn't start until the 2020s, when I was about 15. When people finally realized that it was really happening. When they realized, it was too late to stop it. But how do you get out of the way of a catastrophe you can't see? Yep, I remember, like it was yesterday. I remember it better than last night's dreams. Most people don't have a clue about *the good time*. It wasn't all that good."

Clete took the bait. "See, that's what I want. That's exactly what I need to know. Like what?"

Ruth smiled. "I remember when the ocean was the best place to live. Everyone who could afford it lived there. I loved to go to the ocean."

How interesting, Clete thought to himself. Everyone knew how dangerous it was living next to the oceans—the crime and deterioration of all the old buildings, slums for migrants and the homeless, "homesteads for organized crime," he thought. Terrorists had carried out an attack in '76, coming down from Canada through the coastal slums that lined the

ocean side of New York state and gotten to the Mayor. Her entire staff was killed. No one ever found out who the terrorists were, but there were strong suspicions that they were hired hits for an organized crime group battling for control of the harbor area. The next mayor got the picture, though: She withdrew regular police patrols from the abandoned parts of the harbor area. Clete wiped the sweat off his brow. It was late February, and the day was already heating up.

Ruth smiled. "In the late 2030s when the oceans seemed to be rising faster than expected, surprise, surprise, business stopped insuring any property that was within a half mile of the coast and below 10 feet elevation. Talk about opening a giant can of "all hell done broke loose." Millions of people had to move. So they started a resettlement program that included a government buyout of mortgages at 20 percent of the remaining balance and bought up the insurers at a dime on the dollar. All those people, yep that was millions, took major losses, but what could they do? Banks sure as hell didn't want the land. After that it just deteriorated." She laughed.

"So. You're here for the story. Me and Beto, we traveled together. I went where he went. I stayed where he stayed. We saw it all. I am still with him, you know." Clete looked away, pensive. He felt like he missed something. Ruth continued. "Let's begin back at the beginning, at the start of the great warming. We were warned."

Endnotes

1. In 2013, Canada libraries began a chaotic purge of their contents, particularly of the scientific research they contained. As one observer noted,

Many collections such as the Maurice Lamontagne Institute Library in Mont-Joli, Quebec ended up in dumpsters while others such as Winnipeg's historic Freshwater Institute library were scavenged by citizens, scientists and local environmental consultants. Others were burned or went to landfills, say scientists.

In all, 7 of 9 DFO (Fisheries and Oceans) regional public science libraries were "lost." Another noted that

"The Department has claimed that all useful information from the closed libraries is available in digital form. This is simply not true. Much of the material is lost forever," reports one DFO scientist who requested not to be named.

The decision to purge the material was made by top DSO staff, without input from the regional offices or from the public. They have been accused of reflecting what they call the anti-scientist posture of the Canadian leadership under Stephen Harper. He was quoted, just before the 2003 founding of the saying, for instance, "We're gearing up for the biggest struggle our party has faced since you entrusted me with the leadership. I'm talking about the "battle of Kyoto" — our campaign to block the job-killing, economy-destroying Kyoto Accord."

SECTION

GLOBAL WARMING

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THE CHALLENGES OF GLOBAL WARMING RESEARCH

Ruth: “We had a wild ride back at the beginning, me and Beto. I saw the country on the back of his bike. He would say to me, ‘We’ve got to see this country now, before it all goes away.’ He rode like we was bein’ chased, and maybe we were. We had this monster storm from hell barreling down on us. But the politicians, scratch them on their fat bellies with a bit of jingle, their hearts and minds will follow. And could they sell a bill of goods! They were like, ‘Do you want a job today or would you sooner have your kids go without work and food because of all these radical scientists?’”

“So, for anyone reading news or watching their TVs, you’d think that a lot of eggheads were disagreeing about what was going to happen.”

Clete: “TV, do you mean liquiscreens? And did you actually read great big sheets of paper back then?”

Ruth: “You got a lot of fillin’ in to do. Yep and yep. Anyway, to get back to the point, who is going to change their lives when no one can figure out what the truth is? Even when it started to happen, people did not believe it. All the way back to 2014, you could go to Norfolk and see the ocean coming up over the streets, and the pols still denied it and the people still wouldn’t believe it.”¹

“We could see changes in people, too, in some places. The cities were already too hot; it was the temperature itself sometimes, all it took to make people violent. Snuff goes the power grid, snuff goes the air conditioning, everyone’s pissed. Of course there’s violence. They weren’t violent at global warming, just angry it seemed.”

This opening chapter affords us the opportunity to address two issues that are important to the topic of global warming and violence. The first is the challenge of global warming research in a hostile environment. This is important because research is at the core of the field, it is important research, and it is frequently misrepresented. We will discuss that misrepresentation, how and why research is misrepresented, and provide some suggestions on how to recognize misrepresented research. The second is a review of research focusing on what might be called the basic building

block of a book on global warming and crime—is there any research that actually shows that crime and violence are related to temperature or other aspects of weather?

For a researcher, global warming is a fascinating challenge. The quality of the research produced is very high, carried out by some of the sharpest research minds in the world. Anyone playing at this level and with this crowd will quickly build and establish a reputation. Quality research that shows significant outcomes will propel one into the academic limelight quickly. Positive findings showing warming effects, especially strong findings, will publish well. Significant findings that reject predominant perspectives also publish well; such is the nature of the peer review process, and the ability to make a unique contribution is the cornerstone of reputation building. One of the many features of science wholly misunderstood by its critics is that reputations are earned, not by agreeing with everyone else's research findings, but by finding something new and different. The idea that a substantial percentage of distinguished scientists would agree on anything is remarkable.

Positive findings that are consistent with global warming, however, carry a different emotional tenor than negative ones. A positive finding has two very negative consequences that could tempt a scholar to avoid the topic altogether. For one, the researcher is finding something that is likely to mean immense hardship for many, many people in the future. If the core of one's field is doom and gloom, it is hard to stay positive. For another, the researcher is likely to come under both political and personal attack in both public and professional settings. He or she will be bitten by the very sharp teeth of politicians, lobbyists, and big businesses, and few researchers like the limelight for exactly that reason. All researchers should familiarize themselves with the adage "Politics—red of tooth and claw."²

From a research perspective, global warming is not a specific thing; it is an ongoing multidisciplinary work whose core structure is well known but whose contours, implications, and consequences are formative. It falls into the spectrum of problems noted by Wallerstein (1996). Their inherent nature requires multidisciplinary work, and they lack problem resolution. Problems at this scale have an additional problem and a trenchant one at that. Its advocates face harsh political counterattack. Global warming, a topic important enough to bridge the musty halls of academe and front page news, faces a hostile political agenda sharpened from the cigarette research wars: a well-organized business, lobbyist, and political constituency with one goal—create doubt with the lay public that there actually might be a global warming problem.

Section I focuses on the research dilemma faced by researchers and by the lay public as well: How do we know what respectable

research is, and how can we recognize a challenge to that research when its only purpose is to create doubt? Certainly, scientists contend with each other all the time. This contention can look very much like the political doubt-creation agenda. Scientific dispute is commonplace and expected; it is at the core of the peer review process that underlays scientific assessment and publication. So we can say that we need to distinguish between two sources of contention—scientific contention that is characteristic of good science and that reflects the growth of a scientific field, and contention that is used by the doubt creators.

The doubt-creation agenda, however, is a cottage industry funded by major businesses and is recognizable for its relentless rejection of any bit of scientific research that might be used to support global warming arguments. The challenge is to recognize which is which, and a significant challenge it is, because the doubt-creation crew often uses information from scientific disputes to justify its anti-global warming agenda. This challenge is substantial; the doubt creators have substantial resources, they know how to play the doubt game, and they are in it for the long haul. Indeed, the survival of many of the businesses that fund them may depend on it.

Section II is about the most basic relationship in a book on global warming, violence, and crime: Is there any evidence that actually links crime and temperature or other aspects of weather? Historically, research on weather and crime has been largely peripheral in the field of criminology. Our field is perpetrator focused; we seem to be interested in the characteristics, or shortcomings, of people who commit crime. Adding context, especially context that is largely out of the control of humans, has simply not generated a lot of interest—at least until now. There is, however, a small body of intriguing research on the field, and with the surging interest in global warming it is likely to grow. We consequently review research on crime and temperature, and at the end of the section, we review some of the more contemporary research linking temperature and rainfall to state conflict.

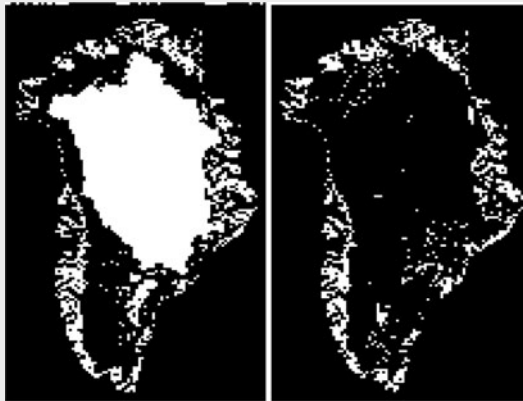
Is Global Warming Research Concocted by a Bunch of Academic Anti-American Radicals? The Use and Misuse of Science in Climate Study and Forecasting

Global warming is a complex field, scientifically dense with arcane and highly technical discussions. Yet it is a field of enormous personal interest for the lay public; global warming has profound

implications for their lives and for the lives of their children. It is also of financial interest to many businesses and governments; the fossil fuels that contribute to global warming are integral to technological development and routine life around the globe. Three discussions of ice melt-off and its association with global warming are presented in the information boxes below. All three were reported in July 2012. Information Box 1.1, titled “News Brief 1,” describes an unusually heavy melt-off on Greenland’s ice sheet.

Information Box 1.1 Rare Burst of Melting Seen in Greenland’s Ice Sheet

In a scant four days, the surface of Greenland’s ice sheet melted to an extent not witnessed in 30 years of satellite observations, NASA reported on Tuesday.



NASA

The extent of Greenland’s ice sheet surface, in white, on July 8, left, and July 12, right, are based on measurements from three satellites, which pass over at different times. On average, about half of the surface of the ice sheet melts during the summer. But from July 8 to 12, the ice melt expanded from 40% of the ice sheet to 97%, according to scientists who analyzed the data from satellites deployed by NASA and India’s space research institute.

“I started looking at the satellite imagery and saw something that was really unprecedented” since the advent of satellite imaging of the earth’s frozen surface, or cryosphere, said Thomas L. Mote, a climate scientist at the University of Georgia who for 20 years has been studying ice changes on Greenland detected by satellite. While scientists described it as an “extreme event” not previously recorded from space, they hastened to add that it was normal in a broader historical context.

Ice core samples taken from the summit of Greenland’s ice sheet that shed light on 10,000 years of its history show that a similar large-scale melting event has happened roughly every 150 years, said Lora Koenig, a glaciologist with NASA’s Goddard Space Flight Center who has also studied the satellite imagery.

Source: Rare Burst of Melting Seen in Greenland’s Ice Sheet. Retrieved March, 2012 at http://www.nytimes.com/2012/07/25/science/earth/rare-burst-of-melting-seen-in-greenland-ice-sheet.html?_r=0

Information Box 1.2 Seals Show Antarctic Ice Shelf Melting Slower Than Thought

The Fimbul Ice Shelf, located along eastern Antarctica in the Weddell Sea, is the sixth-largest of the 43 ice shelves on the Antarctica's perimeter. Ice shelves are thick floating platforms of ice that form where a glacier or ice sheet flows down to a coastline and onto the ocean surface. If an ice shelf is melting rapidly, the glacier may flow faster into the sea, contributing to sea level rise.

The Fimbul Ice Shelf is melting because of both its size and proximity to the East Antarctic Ice Sheet, the largest ice sheet on earth. If that ice sheet melted, the water it generated could lead to extreme changes in sea level.

Computer models had previously showed significant melting of the Fimbul Ice Shelf.

Scientists drilled several deep holes into the shelf to assess directly how quickly the ice is melting. This gave them a partial understanding of what was going on; that water there was colder than expected by previous models.

Nine male elephant seals were outfitted with sensors that measure salinity, temperature, and depth. The sensors were attached to the seals by a different research group in a separate study, but the migrating seals gathered the data needed to fill the missing blanks about the Fimbul Ice Shelf.

Past studies were based on computer models without any direct data for comparison or guidance. Those studies overestimated the water temperatures and extent of melting beneath the ice shelf, led to the misconception that the ice shelf is losing mass at a faster rate than it is gaining mass.

Source: OurAmazingPlanet Staff, (2012), "Seals Show Antarctic Ice Shelf Melting Slower Than Thought," LiveScience.com

The second news brief shares information on a novel research strategy to study melt-off in the Antarctic Ice Shelf and what it found. It is presented in Information Box 1.2.

The third news brief, in Information Box 1.3, discusses the Greenland ice melt-off and explains why it is not global warming.

The Takeaway

These three news articles share a similar theme: that the great planetary ice sheets are of considerable interest. There are also important differences in the news briefs. Those are what we call the takeaway—the points we want to make in comparing these three news briefs. They provide us with the opportunity to present, as bullet points, the uses and misuses of scientific research.

- Both of the first two briefs used scientific methods to come to their conclusions. Scientific methods have some commonalities across all fields, as shown by these two articles.
- A scientist assesses evidence according to measuring instruments intended to assess real-world processes. This is the most integral aspect of science: It is empirical, which

Information Box 1.3 Skeptics Put the Freeze on NASA “Hot Air” About Greenland Ice

Some scientists refute NASA’s claim that Greenland is experiencing “unprecedented” melting. NASA said a heat dome over the country melted whopping 97% of Greenland’s ice sheet in July 2012, citing it as more evidence of the effect humankind is having on the planet.

According to glaciologists, though, it was actually to be expected.

Lora Koenig, a glaciologist and member of the research team analyzing the satellite data, said that ice cores from Summit Station indicate that melting events of this type occur about once every 150 years on average, with the last one happening in 1889.

Source: Kaplan, J.A. (2012), “Skeptics put the freeze on NASA ‘hot air’ about Greenland ice.” See <http://www.foxnews.com/scitech/2012/07/26/skeptics-put-freeze-on-nasa-hot-air-about-greenland-ice/>

means that it is always based on what can be observed (even if it takes special instrumentation to observe it).

- If an idea cannot be disproven, it is not science. If it cannot be measured, it cannot be disproven and consequently is not science—it might be philosophy, political ideology, religion, or morality, and it might be a wonderful idea, but it is not science. For example, the existence of God is not disprovable. This means that he, she, and it cannot be studied scientifically. Atoms can be studied scientifically because even though we cannot see them, we can build machines that do. We have even built some machines that can remove all matter from between atoms so that we can measure what is left. It is through such machinery that we have discovered that pure empty space—space with absolutely no matter in it whatsoever—has a structure. Science is really amazing, itself an important takeaway from this.
- Nothing should be presented as “truth.” All knowledge, in science, is contingent on the current level of knowledge. This has an important implication that should help the reader recognize good science—scientists never come to definitive conclusions. Findings are always, always conditional. Hence, scientists use words like consensus, probability, and significance instead of truth to indicate that, at this point, an idea has support. The word “truth” is not part of its vocabulary.
- The third news brief uses the same scientific literature to make its points. But after a careful reading of the first two briefs, it is