

Cities and Climate Change: A Review Essay*

JOEL E. COHEN

Over half a billion city-dwellers live in coastal zones below ten meters' elevation. Like many other New Yorkers, when Hurricane Sandy struck in 2012, I watched a dirty Atlantic Ocean pour into my home. Hurricane Katrina in New Orleans in 2005 and Hurricane Sandy in New York in 2012, detailed in *Climate Change and Cities*, were the first- and second most costly "natural" disasters in US history. They are the opening breeze of a storm of "natural" disasters that will to come to the US and the world without, and possibly even with, prompt, large-scale action on climate change.

I put "natural" in quotes because the human and financial costs of Katrina and Sandy were as much artifacts as insults of nature. For example, from 2005 to 2009, the South Ferry subway station—in a high-risk flood zone of New York City—underwent a construction project that cost \$530 million. The station was not flood-proofed. Sandy's 4.3-meter (14.1-foot) storm surge damaged it severely. Both hurricanes, according to *Climate Change and Cities*, "disproportionately impacted social groups with lower incomes and social status, particularly ethnic minorities and women." The chief victims were not the people who decide our climate future. Despite the costs of these and many similar recent disasters, despite the documented expectation that storms of such magnitude will become increasingly frequent within decades (Lin et al. 2016; Garner et al. 2017), politics and leadership in the pocket of fossil-fuel interests have stymied adequate responses.

Because cities are on the front line of climate change, some urban leadership has been enlightened. New York City has set a goal to reduce its greenhouse gas emissions by at least 80 percent by 2050. The latest progress report from New York's "80 × 50" initiative begins, "Climate change is an existential threat to our city, our country, and our planet."¹ The words "existential threat" may have been intended as political hyperbole, but they are unfortunately plausible for the more than half-billion city folk around the world who live at water's edge.

* *Cool Cities: Urban Sovereignty and the Fix for Global Warming*, Benjamin R. Barber. Yale University Press, 207 pp., \$26.00; *Climate of Hope: How Cities, Businesses, and Citizens Can Save the Planet*, Michael Bloomberg and Carl Pope. St. Martin's Press, 264 pp., \$26.99; *Extreme Cities: The Peril and Promise of Urban Life in the Age of Climate Change*, Ashley Dawson. Verso, 378 pp., \$29.95; *The Water Will Come: Rising Seas, Sinking Cities, and the Remaking of the Civilized World*, Jeff Goodell. Little, Brown, 340 pp., \$28.00; *Climate Change and Cities: Second Assessment Report of the Urban Climate Change Research Network*, edited by Cynthia Rosenzweig, William Solecki, Patricia Romero-Lankao, Shagun Mehrotra, Shobhakar Dhakal, and Somayya Ali Ibrahim. Urban Climate Change Research Network and Cambridge University Press.

Since 1993, the global sea level has risen every year, on average, by more than it rose the year before. The acceleration, if continued, would more than double the sea-level rise by 2100 compared to a sustained sea-level rise at the current rate. Instead of a one-foot rise, look for a rise of more than two feet—65.4 centimeters rather than 26 to 33 centimeters in total (Nerem et al. 2018). Some regions, like the Chesapeake Bay area, are likely to experience faster rises; others, slower. Predictions for the next century have wide margins of uncertainty. They are likely to err on the low side, as new instabilities in polar ice masses and ocean currents are recognized.

Cities are especially vulnerable to the effects of climate change, through their location, infrastructure, social and economic inequality, and the constraints on their power to govern themselves imposed by higher levels of government. At the same time, cities are also particularly empowered to combat the effects of climate change and prepare well for natural disasters, through their population size, economic and human resources, closeness to the problems of climate change, and potential for acting collectively within and among cities. These five books² offer very different perspectives on how cities can and should respond to climate change. None offers all the answers, but each contributes important parts of the picture.

Jeff Goodell, a contributing editor at *Rolling Stone*, reports firsthand from the Greenland ice sheets, Obama's Air Force One, and coastal cities where rising seas have forced a reckoning with climate change. His book *The Water Will Come: Rising Seas, Sinking Cities, and the Remaking of the Civilized World* is a beautiful account of present realities from Venice to Lagos, the opening act of a harrowing drama.

While early humans adapted easily to rising seas by moving to higher ground, Goodell points out the "terrible irony" that rising seas threaten first and foremost the human constructions that make the Fossil Fuel Age possible: the coastal residential, commercial, and industrial developments, the coastal roads, railroads, tunnels, and airports.

Goodell tells the history of the development of Florida, starting from 14,500 years ago when sea levels were much lower, interweaving accounts of his wading through flooded streets with local organizers and scientists. Miami gets special attention. If you need to be dissuaded from buying Florida real estate, read this book. In the spring of 2016, Goodell asked developers whether sea-level rise has changed their thinking about the real estate business in South Florida. Florida real estate magnate Jorge Pérez told Goodell that "in twenty or thirty years, someone is going to find a solution for this. ... If it is a problem for Miami, it will also be a problem for New York and Boston—so where are people going to go? Besides, by that time, I'll be dead, so what does it matter?"

Another real estate broker Goodell spoke with "was apoplectic over a talk she'd heard that afternoon about whether real estate brokers should be required to disclose flood risks related to sea-level rise on properties they sell. 'That would be idiotic,' she told me, gulping down a gin and tonic. 'It would just kill the market.'"

In fairness, Goodell reports that some developers combine an appreciation of facts with conscience. Wayne Pathman, under the umbrella of the Miami Beach Chamber of Commerce, which he chaired, organized an evening program on the Economic Impact of Sea-Level Rise. As Goodell put it, "The unstated theme of the evening was *Holy shit, this is real—what are we going to do about it?*" (p. 97). The aim of the event was to get real estate developers to start thinking about their options.

Goodell, who attended, reports no plans were formulated from the meeting, but points out that, as seas rise, so will costs of flood insurance and so will banks' demands for flood insurance on vulnerable properties. Both will hurt real estate values.

The flight from reality in Miami is not the most outrageous one Goodell describes. A far more frightening story of denial and blindness concerns civilian political interference in the future of US military preparedness for rising sea levels and other consequences of climate change. Naval Station Norfolk, at the south end of the Chesapeake Bay, is home to the Navy's Atlantic Fleet, and is the largest naval base in the United States. Average sea levels are rising in Norfolk, the surrounding towns and military bases of Hampton Roads, and the rest of the mid-Atlantic coast about twice as fast as the global average. When former Secretary of State John Kerry visited the base in 2015 and asked naval officers how long it could remain functional, one of them told him, "Twenty to fifty years." A former commander of Naval Station Norfolk, Joe Bouchard, told Goodell, "You could move some of the ships to other bases or build new smaller bases in more protected places. But the costs would be enormous. We're talking hundreds of billions of dollars."

Ninety-five percent of the naval base's power comes from Dominion Energy, the biggest electric power company in Virginia and one of the biggest burners of coal in the United States. Dominion Energy's burning of fossil fuels contributes directly to the rise in sea levels that is drowning Naval Station Norfolk. Goodell wryly calls the military's use of Dominion Energy "fossil-fuel-assisted suicide."

Until recently, the US Congress encouraged this disregard for the military impacts of climate change. In 2009, Leon Panetta, then director of the CIA, launched the CIA Center on Climate Change and National Security. Climate change deniers in the Congress, especially some from major coal-producing states, did not like this effort to understand how climate change could affect the US military and the world. Following Panetta's replacement and under budgetary pressure from the House of Representatives, the CIA closed the Center in 2012. In 2016, the Republican-controlled House barred the Department of Defense from evaluating how climate change would affect military assets, acquisitions, and preparedness.

Now it is the turn of the Executive Branch to enforce this refusal to prepare for climate change's effects on national security. In 2017, President Donald Trump signed a defense policy law that required the Department of Defense to list the top 10 military bases most vulnerable to climate changes over the next 20 years and to specify measures (and their costs) that would make the bases more resilient to climate change. The Pentagon released a report January 10, 2019, that began: "The effects of a changing climate are a national security issue with potential impacts to Department of Defense (DoD or the Department) missions, operational plans, and installations." The report listed the climatic vulnerabilities of 79 DoD installations in the US. Not one was overseas. Not one was in the Marine Corps. No detailed mitigation plans were offered. The chair of the House Committee on Armed Services, Representative Adam Smith, responded that the report "demonstrates a continued unwillingness to seriously recognize and address the threat that climate change poses to our national security and military readiness." He and two other Representatives requested a revised report by April 1, 2019. If a revised report exists, it was not announced by that date.³

Goodell's view of whether people affect the climate is clear: "if you're still questioning the link between human activity and climate change, you're reading the wrong book. ... The best way to save coastal cities is to quit burning fossil fuels." How to achieve that transformation he does not say. He urges cities to prepare in the short term by tightening building codes in flood zones and hardening coastal infrastructure, for example. He leaves open the larger question of whether and how cities can help wean the world from fossil fuels.

Extreme Cities: The Peril and Promise of Urban Life in the Age of Climate Change, by Ashley Dawson, professor of English at the City University of New York (College of Staten Island and The Graduate Center), surveys much of the same terrain from the political left. For Dawson, "extreme city" refers to a city of "stark economic inequality, the defining urban characteristic of our time, and one of the greatest threats to the sustainability of urban existence." How and whether a city responds to or ignores economic inequalities of race, class, and gender determine "how well it will weather the storms that are bearing down upon humanity."

Dawson discusses the Red Hook Houses, built in the late 1930s for dockworkers. Red Hook Houses were one of the first and largest federal housing projects in the country and are the largest public housing development in Brooklyn. Since the 1950s, the neighborhood has suffered a long economic decline as containerized shipping replaced workers and waterfront jobs fled.

By the time superstorm Sandy struck New York City, the New York City Housing Authority had shut down electricity, and consequently elevators, boilers, and water pumps, in public housing in the areas at the highest risk of flooding, including Red Hook. This preventive action left roughly eight thousand residents with no heat, water, or electricity. The Red Cross and the federal government did not bring supplies to the neighborhood for days. While the Federal Emergency Management Agency could not be reached by phone, Sheryl Nash-Chisholm, a resident of Red Hook, and the Red Hook Initiative, a community organization for the youth of the neighborhood, stepped into the gap. Nash-Chisholm organized electric power for charging cell phones and a warm space to prevent hypothermia. With the support and contributions of hundreds of volunteers, for three days Red Hook Initiative collected and distributed key supplies including food and water. A colleague dispatched medical delegations to check on vulnerable elderly residents of Red Hook Houses.

This community response to Sandy is an example of what Dawson calls "disaster communism":

Communal solidarities forged in the teeth of calamity can be seen as a form of disaster communism, under which people begin to organize themselves to meet one another's basic needs and to collectively [sic] survive.

Dawson's political perspective shapes his view on how and why climate change threatens cities:

Urban growth is driven at bottom by capitalism ... There is no green capitalist exit from the extreme city, when capitalism is founded on the principle of "grow or die." The fossil capitalism that is driving planetary ecosystems toward a mass extinction event was adopted for the profit of a miniscule [sic] powerful global elite.

Notwithstanding Dawson's belief that capitalism drives urbanization, cities grew before capitalism existed and still grow in today's least capitalist countries. Demographers say that urban populations grow from natural increase (births minus deaths), net migration (immigrants minus emigrants), annexation (as when the five boroughs united to form New York City), and reclassification (when formerly rural, now densely settled areas are recognized as urban). Around the world, with regional variations, natural increase accounts for roughly three-fifths of urban population growth. Economic development (including but not limited to that driven by capitalism), cultural development, and environmental quality make cities attractive to their natives and to migrants.

Dawson highlights the importance of what he calls "climate justice": protecting the poor and vulnerable from the effects of climate change on an equal footing with the rich and powerful. For example, if New York City builds a wall around lower Manhattan to protect Wall Street from rising seas, how about treating low-lying low-income residential areas on an equal basis?

By insisting on "climate justice" and "disaster communism," Dawson makes two important, often overlooked points: that proposed responses to climate change should be equitable; and that social solidarity and mutual aid can be crucial in some crises. But "climate justice" and "disaster communism" seem unlikely to spur major economies "to quit burning fossil fuels," as Goodell recommends; unlikely to get the World Bank Group to subsidize or insure investments in sustainable infrastructure in developing countries, as Bloomberg and Pope recommend in *Climate of Hope*; unlikely to help cities retain the taxes they need to cope with climate change, as Barber recommends in *Cool Cities*; and unlikely to lead to a host of other coordinated economic, cultural, political, legal, institutional, environmental, and demographic changes that will be required to address climate change. Dawson's solutions are necessary but not sufficient.

The title of *Climate of Hope: How Cities, Businesses, and Citizens Can Save the Planet*, tells you that its authors, Michael Bloomberg and Carl Pope, embrace the capitalism Dawson rejects. This comes as no surprise from billionaire philanthropist Bloomberg, three-term mayor of New York City. It is a little surprising in the case of environmentalist Pope, who was a long-time executive director and chair of the Sierra Club and leader of its campaign Beyond Coal. Despite political differences, the two men have long collaborated in plans to reduce New York City's negative effects on climate change. They quote a common estimate that cities are the source of at least 70 percent of greenhouse gas emissions. (Estimates vary widely. Few cities measure their greenhouse gas emissions.)

On the other hand, according to the Bloomberg administration's "PlaNYC" of 2007, greenhouse gas emissions per person in New York City were only 29 percent of the US average (7.1 metric tons of carbon dioxide equivalent per person per year, versus 24.5 nationally). New Yorkers also consume less water and electricity per person and produce less garbage per person than people in the average American city. Cities contribute to climate problems and to their solutions.

Bloomberg argues that cities "don't need to choose between economic growth and saving the planet. These are not technological challenges. They are challenges of policy, governance, and leadership. ... Our society can't function without business, which means we can't solve the climate puzzle without business involvement."

Bloomberg and Pope make what they call the conservative case for action on climate change, but their “conservative case” leaves many questions unanswered. They argue that free market principles would allow owners of solar panels to compete with utilities in electricity production and would end fossil fuel subsidies. (Would Bloomberg and Pope advocate ending subsidies for research, development, and installation of renewable energy sources, like solar panels?)

Conservatives, they say, should invest in infrastructure to reduce emissions because they “make the United States more economically competitive,” creating conditions favorable for the growth of businesses. (Don’t major investments in infrastructure require government intervention, at least through locating the goal posts and setting the rules of the game?) Because “being conservative means being cautious about the future,” conservatives should take steps now to reduce the risk of potentially very costly future consequences of climate change. Too often, markets fail to reflect the economic advantages of action now on climate change. (Don’t arguments for action now to forestall future damages from climate change depend on both a discount rate and confident knowledge about future damages from climate change?)

Conservatives conserve, say Bloomberg and Pope: within the US (natural resources à la Teddy Roosevelt) and globally (the Montreal Protocol à la Ronald Reagan). (How would Bloomberg and Pope account for the notable lack of interest in conserving domestic and global environmental resources, including the composition of the atmosphere, on the part of many “conservative” voters and members of the present national administration of the US?)

Rich countries can help poorer countries respond to challenges of climate change with multidecadal, large-scale capital investments, Bloomberg and Pope argue. The risks include failures of specific projects but more importantly, wars, revolutions, and changes in the politics of national governments. Such risks inhibit long-term capital investments. In developing countries, the costs of borrowing for large capital investments are high; available capital is sparse. The main economic challenge, according to Bloomberg and Pope, is to change policies in multilateral development banks led by the World Bank Group “to reduce risk in sustainable infrastructure investments in developing markets” that have high interest rates and few buying or selling offers for capital. For example, at present, the World Bank can make loans only to nations. Bloomberg and Pope recommend that the Bank be allowed to make loans to cities as well. Many cities have more people and more economic activity than dozens of smaller countries. Many cities can provide the transparency and accountability banks require.

Bloomberg and Pope also recommend ending subsidies to fossil fuel producers and large agricultural interests (without comparing these subsidies to those received by “green” energy companies); requiring all parts of the economy—“including fossil fuel companies, manufacturers, commodity traders, banks, insurance companies, and government regulators—to measure and disclose data on climate-related risks” (not a move likely to be widely welcomed without government pressure, if the real-estate industry in Miami is indicative); ending monopolies on producing and selling electricity; investing in natural resources like soil carbon; setting regulatory standards (not a free-market solution) and realigning economic incentives to enable investors to collect some of the money saved by energy efficiency in rental buildings;

and cracking down on “rent seeking,” the acquisition of special economic benefits through lobbying or political influence without paying for them.

Many cities lack credit ratings and cannot borrow to finance their own infrastructure. Many cannot adopt a local sales tax without approval from some higher administrative unit. Bloomberg and Pope recommend removing the legal obstacles that prevent many cities from financing and implementing solutions to problems of climate change. They call on all (presumably citizens as well as business and political leaders) to “urge their national governments to devolve more power to cities. ... Devolving power to cities is the best single step that nations can take to improve their ability to fight climate change.”

Bloomberg and Pope’s “conservative case” for action on climate change seems a sheep in wolf’s clothing because its “baa” is more aggressive than its bite. In a democracy, state and national governments seem unlikely to devolve significant powers to their cities until massive urbanization overwhelms the political opposition of rural areas. It seems likely to require much more than this “conservative case” to arouse potential urban voters to vote in their own self-interest and tip this long-term political power struggle.

In January 2018, New York Mayor Bill de Blasio announced plans for New York City’s pension funds to divest about \$5 billion from fossil fuel companies over the next five years, and to sue five large fossil fuel companies—BP, Exxon Mobil, Chevron, ConocoPhillips, and Shell—in federal court for contributing to climate change that harms New York City. In July 2018, the lower house of Ireland’s legislature voted to ban “as soon as is practicable” Ireland’s sovereign wealth fund from investing in firms that derive more than 20 percent of revenues from fossil fuels, and in November 2018, the upper house confirmed the bill, making Ireland the first country to plan to divest its sovereign investments from fossil fuels. Ireland had about €318 million (\$361 million) invested in coal, oil, gas, and peat assets, less than one-tenth of the fossil-fuel investments of New York City’s pension funds. In September 2018, de Blasio and London’s Mayor Sadiq Khan urged other cities to divest holdings in fossil fuel companies.

It is unclear whether these actions are symbolic or effective when compared, for example, to reducing the size of each city government’s car fleet and making it all electric, or to enacting congestion tolls on fossil-fueled cars in the central city to support mass transit, or to modifying building codes to make space heating in cold climates and air-conditioning in warm climates more efficient, among a host of other practical, on-the-ground needed modifications. Bloomberg and Pope are certainly right to focus on cities’ need to be able to govern themselves, as does the next book.

Benjamin R. Barber (1939–2017), founder of the Global Parliament of Mayors, agreed that delegating power to cities is crucial. His 2013 book, *If Mayors Ruled the World: Dysfunctional Nations, Rising Cities*, argued for networks of cities and collaborative political action. His *Cool Cities: Urban Sovereignty and the Fix for Global Warming*, published six days before he died, applies those arguments to climate change. It is the shortest, most theoretical of the five books I review here. Barber argues that nations (and international bodies) have failed to protect their citizens against climate change, thereby forfeiting their right to sovereignty.

One city cannot address climate change successfully without the coordinated action of many other cities. For example, in September 2018, de Blasio of New York and Khan of London teamed up with C40, a global network of cities, to create the C40 Divest/Invest Forum to encourage cities to divest from fossil fuel holdings. To assure that “urban networks can succeed in securing justice and sustainability for their citizens,” Barber writes, cities must first acquire or retain the money and legal authority they need to fulfill their responsibilities to their citizens. Cities around the world pay more into the coffers of higher levels of government than they get back. With or without permission from national governments, cities must establish their right to govern themselves collectively across national boundaries. Cities must create an “urban rights movement,” an “Urban Party” to lobby higher levels of government “for autonomy, resources, and legitimacy,” as Barber described in detail in 2013.

The climate justice that obsesses Dawson in *Extreme Cities* matters to Barber too:

The rich man reacts to the rising tide by moving his summer home from Cannes to St. Moritz. The poor woman holding her newborn drowns. ... an environmental plan that is not also an environmental justice plan is not only politically insupportable but morally untenable.

Time and demography may be on the side of Barber’s dreams. In 2018, an estimated 55 percent of all people lived in cities, and by 2050, a projected 68 percent will—an increase of 2.5 billion city dwellers (United Nations Population Division 2018). It would not be surprising if those billions asserted their political rights for safety and justice in the face of climate change and other threats. Whether they will depends on politics, leadership, and enough climate catastrophes to hold people’s attention.

Climate Change and Cities: Second Assessment Report of the Urban Climate Change Research Network (UCCRN) is an encyclopedia that offers everything that city leaders, policymakers, businesses, nonprofits, and the community ever wanted to know about cities and climate change.⁴ It updates the UCCRN’s *First Assessment Report on Climate Change and Cities* published in 2011. The earlier report surveyed cities, disasters, and climate risks; urban climate science and modeling; urban energy, water, wastewater, transportation, health, and governance.

This update surveys new research and adds guidance for cities on how to integrate climate mitigation (reducing future threats) and adaptation (responding to what happens), urban planning and design, equity and environmental justice, economics, finance, and the private sector, urban biodiversity and ecosystems, housing, informal settlements, urban solid waste, and the special problems of “Urban Areas in Coastal Zones.” Other new topics include information and communications technology, urban demographics, and the psychological, social, and behavioral challenges and opportunities of decisionmaking about climate change. The 46 case studies of cities’ responses to climate change in the earlier report have grown to well over one hundred case studies in a searchable online database. Hurricane Sandy, the subject of one of these case studies, figures prominently in many parts of the new report.

The summary for city leaders emphasizes actions to reduce greenhouse gas emissions; to assess risks and prepare climate action plans jointly with scientists

and all stakeholders; to respond to needs of the urban poor, the elderly, women, minorities, recent immigrants, and other marginal populations; to enhance the city's credit-worthiness; to plan long-term; and to participate in national and international capacity-building networks.

To reduce the risks of climate-related disasters, the report recommends a shift away from a traditional focus on single hazards such as heat waves, floods, and droughts, based on past events, to "integrated, system-based risk assessments and interventions that address current and future hazards throughout entire metropolitan regions." This shift requires cities to develop the institutional capacities, collaborations, and human resources to make integrated risk assessments. Cities should also: develop the financial capacity for resilient responses using public-private partnerships; buy land and properties in hazard-prone areas and use them to reduce risks; strengthen local social cohesion and cooperation; use tax and fiscal policies to enhance safety and encourage necessary relocation; formulate and enforce zoning ordinances and building standards appropriate for climate risks; require sellers of real estate to disclose hazards of flooding, landslides, mudslides, or earthquakes, for example; use natural buffers; strengthen infrastructure resilience (e.g., by removing critical public facilities from hazardous areas); anticipate needs for recovery when disasters happen; and build back better or elsewhere. The report gives many examples.

While a hurricane's intensity and its physical effects matter, the impact of climate-related disasters depends at least as much, the report says, on the local and regional culture, demography, and economics, on "local governments' institutional capacity, the built environment, the provision of ecosystem services, and human-induced stresses." Prepare!

Urban responses to climate change have a few broad options. One is to do nothing; do not prepare; do not implement plans. (Play now; pay later, you, your children, and their children.) One is to defend the status quo: try to enable people to go on living and working just as they do now; build around the problems. One is to seek transformation: encourage people to move out of harm's way; reimagine where and how cities develop so that they may prosper in the coming climate. One is to mix these strategies: with as much foresight as possible, try to prevent future damage and plan to adapt as necessary to what comes.

Collectively, these five books and the dozens (perhaps hundreds) of other recent books on cities and climate change show that climate change poses big, interlinked, locally different problems for many, maybe all, cities. They warn against looking only for easy, simple solutions.

The best model for what may lie ahead comes from the last warm period between ice ages, about 129 to 116 thousand years ago, an interval geologists call the "Eemian interglacial." Global mean surface temperatures then were at least 2 degrees Celsius warmer than at present. Such warming is projected for later this century if no effective action is taken to reduce emissions. Mean sea levels in the Eemian were higher than now by some 4 to 6 meters (13–20 feet), though estimates vary, with fluctuations of up to 10 meters (33 feet) around the mean. In the course of these fluctuations, sea levels sometimes rose as fast as 2.5 meters (8 feet) or even 3.5 meters (11.5 feet) per century (Rohling et al. 2008). Sea-level rises of that size and speed would drown many of today's coastal cities, as Goodell fantasizes in the

last pages of *The Water Will Come*. A principal source of the water that raised sea levels during the Eemian was a collapse of the West Antarctic Ice Sheet (Carlson et al. 2018; Voosen 2018). The West Antarctic Ice Sheet is under severe threat today. Its base, below sea level, is warmed by the ocean while glaciers around it retreat. Will my children and their children, now living at low elevations near Boston and San Francisco, see the Atlantic and Pacific Oceans pour into their homes, as I saw the Atlantic pour into mine?

Notes

1 <https://www1.nyc.gov/site/sustainability/codes/80x50.page>.

2 Part of a flood of books on cities and climate change: *Climate Change Resilience in the Urban Environment*; *High Tide on Main Street*; *Cities and Climate Change: Responding to an Urgent Agenda*; *The City and the Coming Climate: Climate Change in the Places We Live*; *Climate Change, Disaster Risk, and the Urban Poor*; *Virginia Climate Fever: How Global Warming Will Transform Our Cities, Shorelines, and Forests*; *Mitigating Climate Change: The Emerging Face of Modern Cities*; *The Power of Cities in Global Climate Politics: Saviours, Supplicants or Agents of Change?*; *Storming the Wall: Climate Change, Migration, and Homeland Security*; *The Sustainable City*; *Cities Building Resilience for a Changing World*; *Building Resilience in an Urban Coastal Environment: Integrated, Science-Based Planning in Jamaica Bay*, New York; *Prospects for Resilience: Insights from New York City's Jamaica*

Bay; *Urbanism in the Age of Climate Change*; *The Urban Climate Challenge: Rethinking the Role of Cities in the Global Climate Regime*; *Sinking Chicago: Climate Change and the Remaking of a Flood-Prone Environment*.

3 For the history and current status of the US military's interactions with climate change, see <https://www.defenseone.com/ideas/2019/03/ep-41-climate-change-versus-us-military/155948/?oref=d-dontmiss>.

4 A companion technical report is *The Future We Don't Want: How Climate Change Could Impact the World's Greatest Cities*. UC-CRN Technical Report, February 2018, 59 pp. <https://www.c40.org/other/the-future-we-don-t-want-homepage>. It summarizes six key "climate vulnerabilities" of cities: heat extremes; heat extremes and poverty; water availability; food security; sea-level rise and coastal flooding; sea-level rise and energy systems.

JOEL E. COHEN

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AUTHORS FOR THIS ISSUE

AMANDA K. BAUMLE is Professor, Department of Sociology, University of Houston.

JOEL E. COHEN is Abby Rockefeller Mauzé Professor, Laboratory of Populations, The Rockefeller University and Professor, Columbia University, New York.

GRETCHEN DONEHOWER is Academic Specialist, Department of Demography, University of California-Berkeley.

MIGUEL GOUVEIA is Associate Professor, Católica-Lisbon School of Business and Economics, Portugal.

MATHIAS LERCH is Deputy Head of the Fertility and Well-Being Lab, Max Planck Institute for Demographic Research, Germany.

HAMID REZA OSKOROUCHI is Research Fellow in Economics, Institute for Health Care and Public Management, University of Hohenheim, Germany.

SUNG S. PARK is Ph.D. Candidate, Department of Sociology and California Center for Population Research, University of California-Los Angeles.

DUDLEY L. POSTON, JR. is Abell Professor of Liberal Arts, Department of Sociology, Texas A&M University.

PEDRO RAPOSO is Assistant Professor, Católica-Lisbon School of Business and Economics, Portugal.

JUDITH A. SELTZER is Professor, Department of Sociology and California Center for Population Research, University of California-Los Angeles.

MARK TOLTS is Senior Research Associate (ret.), Institute of Contemporary Jewry, Hebrew University of Jerusalem.

LILI VARGHA is Junior Research Fellow, Hungarian Demographic Research Institute; Doctoral School of Sociology and Demography, University of Pécs, Hungary.

EMILY E. WIEMERS is Associate Professor, Department of Economics, University of Massachusetts-Boston.

LARRY WILLMORE is Research Scholar, International Institute for Applied Systems Analysis, Laxenburg, Austria.