

UNITED STATES DISTRICT COURT  
SOUTHERN DISTRICT OF NEW YORK

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CITY OF NEW YORK,

Plaintiff,

-against-

**COMPLAINT**

BP P.L.C.; CHEVRON CORPORATION;  
CONOCOPHILLIPS; EXXON MOBIL CORPORATION;  
and ROYAL DUTCH SHELL PLC,

Case No. 18 cv 182

Defendants.

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Plaintiff the City of New York (“City”), by its attorney Zachary W. Carter, Corporation Counsel of the City of New York, brings this action sounding in public nuisance, private nuisance, and trespass against Defendants BP p.l.c. (“BP”), Chevron Corporation (“Chevron”), ConocoPhillips (“ConocoPhillips”), Exxon Mobil Corporation (“Exxon”), and Royal Dutch Shell plc (“Shell”) (collectively, “Defendants”), and alleges as follows:

## I. INTRODUCTION

1. This lawsuit is based upon the fundamental principle that a corporation that makes a product causing severe harm when used exactly as intended should shoulder the costs of abating that harm. Defendants here produced, marketed, and sold massive quantities of fossil fuels—primarily oil and natural gas—despite knowing that the combustion and use of fossil fuels emit greenhouse gases (“GHG pollution” or “GHGs”), primarily carbon dioxide (“CO<sub>2</sub>”). Defendants have also known for decades that GHG pollution accumulates and remains in the atmosphere for up to hundreds of years, where it traps heat, a process commonly referred to as “climate change” or “global warming,” and that this process would cause grave harm. Defendants continue to this day to produce, market, and sell massive amounts of fossil fuels and plan to continue doing so for decades into the future; their past and ongoing conduct causes and continually exacerbates global warming and all of its impacts, including hotter temperatures, longer and more severe heat waves, extreme precipitation events including heavy downpours, rising sea levels, and other severe and irreversible harms.

2. Defendants’ past and ongoing actions are harming New York City now: the City already has suffered damage from climate change, including inundation, erosion, and regular tidal flooding of its property. The City now faces further imminent threats to its property, its infrastructure, and the health and safety of its residents. In this litigation, the City seeks to shift

the costs of protecting the City from climate change impacts back onto the companies that have done nearly all they could to create this existential threat.

3. Defendants are the five largest, investor-owned producers of fossil fuels in the world, as measured by the cumulative carbon and methane pollution generated from the use of their fossil fuels, according to published, peer-reviewed research.<sup>1</sup> Defendants are collectively responsible, through their production, marketing, and sale of fossil fuels, for over 11% of all the carbon and methane pollution from industrial sources that has accumulated in the atmosphere since the dawn of the Industrial Revolution. Additionally, Defendants are also responsible for leading the public relations strategy for the entire fossil fuel industry, downplaying the risks of climate change and promoting fossil fuel use despite the risks. It is a myth that everyone is responsible for climate change and therefore that no one is responsible. Recent research demonstrates that just 100 fossil fuel producers are responsible for 62% of all GHG emissions from industrial sources since the dawn of the Industrial Revolution and for 71% of emissions since 1988, that over 90% of these emissions are attributable to the fossil fuels that they produce and sell (rather than emit from their own operations), and that most of these emissions have occurred since 1988.

4. Defendants knew decades ago that the fossil fuel products they produce and sell were altering the atmosphere and would cause a dire global warming problem. They acted on this knowledge to protect their own infrastructure and assets, and yet they told the public a very different story. According to recently disclosed documents, by the late 1970s or early 1980s, if not earlier, Defendants knew that averting dangerous climate change required reducing the use of

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<sup>1</sup> Richard Heede, *Tracing Anthropogenic Carbon Dioxide and Methane Emissions to Fossil Fuel and Cement Producers, 1854–2010*, CLIMATIC CHANGE, Jan. 2014.

their fossil fuel products. At that time, scientists working either directly for Defendants or advising Defendants through an industry-wide consulting arrangement warned Defendants in stark terms that fossil fuel use risked “catastrophic” harm from global warming over the coming decades. The oil and gas industry even formed a “CO<sub>2</sub> and Climate Task Force” in the late 1970s—a group that included representatives from each of the Defendants. At a 1980 meeting, this Task Force received a scientific warning that global warming would cause catastrophic harms, found that reductions in fossil fuel usage would result in the “immediate problem being considerably eased,” questioned the long-term “future of fossil fuel use,” and discussed internally “the technical implications of energy source changeover.”

5. However, disregarding the findings of their own internal scientists and scientific consultants, Defendants re-committed themselves to fossil fuel exploration, production, marketing, and sales over the ensuing decades. The significant majority of emissions resulting from fossil fuels produced and marketed by Defendants occurred after Defendants became aware of the consequences of climate change. The majority of emissions resulting from fossil fuels produced and marketed by the fossil fuel industry have occurred since 1988, by which time the Defendants knew that their fossil fuel products were causing a buildup of GHG pollution in the atmosphere that would cause dangerous global warming.

6. But in an effort to protect their market, Defendants orchestrated a campaign of deception and denial regarding climate change. Defendants sponsored publicity campaigns using front groups and paid “scientific” mouthpieces—including some of the same scientists that the tobacco industry had used to downplay the risks of cigarettes—to discredit the mainstream scientific consensus on global warming and downplay the risks of climate change. Defendants also employed large-scale, sophisticated advertising campaigns to promote pervasive fossil fuel

use, conducted either directly or through surrogates like their main U.S. trade association, the American Petroleum Institute (“API”), and to portray fossil fuels as environmentally responsible—a campaign that continues to this day.

7. Defendants are not only quantitatively different from other contributors to climate change given their massive and dangerous levels of fossil fuel production over many years—they are also qualitatively different from other contributors to climate change because of their in-house scientific resources, early knowledge of climate change impacts, commercial promotions of fossil fuels as beneficial despite their knowledge to the contrary, efforts to protect their fossil fuel market by downplaying the risks of climate change, and leadership roles in the API and other organizations that undertook a communications strategy for the fossil fuel industry. In this coordinated effort to discredit the science, which began in earnest during the 1990s and has continued in a subtler form even in recent years, Defendants and their agents and advocates have made the alleged “uncertainty” of climate science their constantly-repeated mantra. The purpose of this campaign of deception and denial was to increase sales and protect market share. It succeeded, and Defendants have profited enormously as a result.

8. Meanwhile, Defendants relied upon their knowledge about climate change science to protect their own business assets from expected rising seas and melting permafrost by incorporating climate change science into their engineering standards for construction of their pipelines, offshore oil platforms, and other projects.

9. To this day, Defendants continue to exacerbate global warming by producing and selling massive quantities of fossil fuels and marketing these fuels as environmentally beneficial—despite a scientific consensus that global warming has entered a critically dangerous phase. And they have continued in recent years to misleadingly tell the public that the science of

global warming is uncertain; as recently as 2016, Defendants' main U.S. trade association, the API, falsely referred to global warming on its website as "possible manmade warming." While Defendants pay lip service to global warming and offer minimal steps toward reducing the carbon footprint from their own operations as window dressing, their multi-decade business plans are based upon more of the same: exploration, production, and sale of fossil fuels at levels that are utterly inconsistent with keeping global warming from exceeding a 3.6 degrees Fahrenheit ("°F") (2 degrees Celsius ("°C")) increase over pre-industrial levels, an amount of warming that is commonly accepted as a point beyond which the most dangerous and even catastrophic consequences of climate change cannot be prevented, much less a 2.7°F (1.5°C) increase, which is the widely adopted target necessary to avoid dangerous global warming impacts. The City has committed to reducing its own emissions in line with this 2.7°F goal.

10. The very climate disruption and injuries that Defendants' scientists and consultants warned them about decades ago have now arrived. Climate change is here and is harming New York City. The temperature in the City is rapidly increasing, sea levels are rapidly rising, coastal storms are causing increased flooding, and extreme precipitation events are increasing throughout the Northeastern United States. Studies by the New York City Panel on Climate Change ("NPCC"), a body of more than a dozen independent leading climate and social scientists, demonstrate that global warming is already causing the City to suffer increased hot days, flooding of low-lying areas, increased shoreline erosion, and higher threats of catastrophic storm surge flooding even more severe than the flooding from Hurricane Sandy. Because there is a lag between emission of greenhouse gases and global warming impacts, these harms will continue and worsen in coming years, as previously emitted greenhouse gases from Defendants' products further heat the atmosphere. As the City has emphasized in its plans to deal with the

inevitable impacts, New York City is “particularly vulnerable to the effects of climate change” because it is built primarily on islands and has 520 miles of coastline.<sup>2</sup> Indeed, Mayor Bill de Blasio has declared that the City faces “an existential threat posed by climate change.”<sup>3</sup>

11. The City is taking action now to protect public safety, public health, and City property and infrastructure from the ravages of climate change through an extensive series of resiliency measures. For example, the City is implementing programs to protect vulnerable residents during increasingly severe heat waves, which already kill more New Yorkers each year than all other natural disasters combined. The City has begun to reinforce its coastline and elevate its infrastructure within the floodplain, and to pursue a vast array of additional measures to protect public health and welfare and avoid or minimize damage to City property from climate change. The City is spending billions of dollars on these resiliency measures.

12. The City must take many more resiliency actions to more fully protect the public and City property and services as the climate marches toward an overheated state that, according to all scientific data, will be unprecedented in the history of human civilization. To deal with what the future will inevitably bring, the City must build sea walls, levees, dunes, and other coastal armament, and elevate and harden a vast array of City-owned structures, properties, and parks along its coastline. For example, the City must enlarge existing storm and wastewater storage facilities and install additional facilities and associated pumping facilities and infrastructure to prevent flooding in low-lying areas that are vulnerable to rising seas and increasingly severe downpours. These are long-term design and construction projects that must

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<sup>2</sup> CITY OF NEW YORK, ONE NEW YORK: THE PLAN FOR A STRONG AND JUST CITY 166, *available at* <http://www.nyc.gov/html/onenyc/downloads/pdf/publications/OneNYC.pdf>.

<sup>3</sup> *Id.* at 3.



be built to last for decades, often up to fifty years or more. The City must take these actions as soon as possible in order to protect public health and safety and City property and infrastructure. The costs of these largely unfunded projects run to many billions of dollars and far exceed the City's resources.

13. This egregious state of affairs is no accident. Defendants' actions in producing, marketing, and selling fossil fuels for decades and at ever more dangerous levels while knowing of the harm that was substantially certain to result constitutes an unlawful public and private nuisance and an illegal trespass upon City property. The City brings such claims against Defendants in this action and seeks: (1) a money judgment for the costs already incurred by the City to protect City infrastructure and property, and to protect the public health, safety, and property of its residents from the effects of climate change; (2) a money judgment for the costs of actions the City is currently taking, and needs to take to protect City infrastructure and property, and to protect the health, safety, and property of its residents from the impacts of climate change; and (3) an equitable order ascertaining the damages and granting an injunction to abate the public nuisance and trespass that would become effective if Defendants fail to pay the court-determined damages for the past and permanent injuries inflicted.

14. The City does not seek to impose liability on Defendants for their direct emissions of greenhouse gases, and does not seek to restrain Defendants from engaging in their business operations.

## **II. PARTIES**

### **A. Plaintiff**

15. Plaintiff the City of New York is a municipal corporation organized under the laws of the State of New York, with its principal place of business located at City Hall, New York, New York. The City is responsible for the public health, safety, and welfare of its more

than 8.5 million residents and the millions of additional people who work in or visit New York City each day.

**B. Defendants**

16. Defendant BP is a public limited company incorporated in England and Wales with its headquarters in London, England, doing business in New York State. BP is a multinational, integrated oil and gas company that explores for, produces, refines, markets, and sells oil, natural gas, and fossil fuel products. On information and belief, Amoco Corporation (which merged into a predecessor of BP in approximately 1998), Atlantic Richfield Company (which merged into a predecessor of BP in approximately 2000), and BP America Inc. (a BP subsidiary that BP describes in an SEC filing as its “chief representative in the US” and “our agent in the US”) were members of the API at all relevant times.<sup>4</sup>

17. Defendant Chevron is a Delaware corporation with its principal place of business located at 6001 Bollinger Canyon Road, San Ramon, California, doing business in New York State. Chevron is a multinational, integrated oil and gas company that explores for, produces, refines, markets, and sells oil, natural gas, and fossil fuel products. On information and belief, Chevron has been a member of the API at all relevant times.

18. Defendant ConocoPhillips is a Delaware corporation with its principal place of business located at 600 North Dairy Ashford, Houston, Texas, doing business in New York State. ConocoPhillips is a multinational oil and gas company that produces, markets, and sells oil and natural gas and for many years also refined and sold finished oil products. On

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<sup>4</sup> See BP P.L.C., ANNUAL REPORT AND FORM 20-F 2016 59, 290, *available at* <https://www.sec.gov/Archives/edgar/data/313807/000119312517112384/d248481d20f.htm>.

information and belief, Conoco Inc. and Phillips Petroleum Company (the two companies which merged to become ConocoPhillips in 2002) were members of the API at all relevant times.

19. Defendant Exxon is a New Jersey corporation with its principal place of business located at 5959 Las Colinas Boulevard, Irving, Texas, doing business in New York State. Exxon is a multinational, integrated oil and gas company that explores for, produces, refines, markets, and sells oil, natural gas, and fossil fuel products and, as recently as 2009 produced, marketed, and sold coal. On information and belief, Exxon Company (an Exxon subsidiary) and Mobil Corporation (which merged into Exxon Corporation to form Defendant Exxon Mobil Corporation in 1999) were members of the API at all relevant times.

20. Defendant Shell is a public limited company incorporated in England and Wales with its headquarters in The Hague, Netherlands, doing business in New York State. Shell is a multinational, integrated oil and gas company that explores for, produces, refines, markets, and sells oil, natural gas, and fossil fuel products. On information and belief, Shell Oil Company was a member of the API at all relevant times, including the 1980s in particular. Shell Oil Company is Defendant Shell's main U.S. subsidiary; its president is Defendant Shell's "U.S. Country Chair."<sup>5</sup>

21. Each Defendant has controlled and continues to control all relevant decisions regarding fossil fuel production, fossil fuel reserves, fossil fuel promotion, and climate policy for their respective corporate families—indeed, these are some of the primary functions that Defendants have performed for their subsidiaries. This control is illustrated by the activities and statements by Defendants described herein. These include advertisements and statements by

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<sup>5</sup> *Our Leaders*, SHELL U.S., <https://www.shell.us/about-us/who-we-are/our-leaders.html> (last visited Jan. 9, 2018).

each Defendant promoting its company-wide production of fossil fuels, and by Defendants' public statements acknowledging their control of company-wide production levels, reserves, and climate policy. For example, Defendants—and not their subsidiaries—annually submit reports to the Carbon Disclosure Project addressing their group-wide climate change policies and actions.<sup>6</sup> Each Defendant, through its employees and/or agents, also controls the process by which its fossil fuels, including raw crude oil and natural gas, are produced, transported, refined, stored, distributed, marketed, and/or sold to consumers by and through its subsidiaries.

22. As a result of Defendants' control over all relevant decisions regarding fossil fuel production, fossil fuel reserves, fossil fuel promotion, and climate policy, Defendants are responsible for their subsidiaries' past and current production and promotion of fossil fuel products and future plans regarding production and promotion.

23. Defendants have at all relevant times controlled and acted through their subsidiaries as their agents concerning the conduct alleged in this complaint.

**C. Defendants' connections to New York.**

24. Defendants have contributed to the temperature increases and global warming induced sea level rise now affecting New York City. These impacts constitute severe harm now and a threat of future catastrophic harm.

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<sup>6</sup> See, e.g., BP Responses to Climate Change 2016 Information Request from Carbon Disclosure Project at 1; Chevron Corporation Responses to Climate Change 2016 Information Request from Carbon Disclosure Project at 2; ConocoPhillips Responses to Climate Change 2016 Information Request from Carbon Disclosure Project at 2; Exxon Mobil Corporation Responses to Climate Change 2016 Information Request from Carbon Disclosure Project at 1; Royal Dutch Shell Responses to Climate Change 2016 Information Request from Carbon Disclosure Project at 2; available at <https://www.cdp.net/en/companies>.

25. Each Defendant, directly and through its subsidiaries, substantially participates in the process by which raw crude oil is extracted from the ground, refined into fossil fuel products, and delivered, marketed, and sold to New York State residents for use.

26. BP's website maintains a page of "BP Amoco Stations Near Me" for New York listing numerous BP-branded gasoline stations in New York State, including stations located in New York City. BP offers credit cards to consumers on its interactive website to promote sales of gasoline and other products at its branded gasoline stations. BP promotes gasoline sales by offering consumers, through its interactive website, "cent-per-gallon rewards" for using BP credit cards that effectively discount gasoline sold at BP stations. BP, including through its subsidiaries acting as its agents, owned and operated the Texas City refinery in Texas from approximately 1999-2013. The Texas City refinery supplied gasoline to the New York Harbor area.

27. Chevron, through its subsidiaries, owns and operates a refinery in Pascagoula, Mississippi, that, upon information and belief, supplies gasoline to the New York Harbor area. Chevron offers credit cards to consumers through its interactive website to promote sales of gasoline and other products at its branded gasoline stations. Chevron promotes gasoline sales on its interactive web site by offering consumers three cents per gallon in fuel credits "every fill-up, every time at Chevron and Texaco stations." Chevron has used New York advertising firms to promote fossil fuel products, including the Chevron advertisements described in Section VIII, below.

28. ConocoPhillips, through its subsidiaries, produces oil in the Bakken formation in North Dakota. On information and belief, this crude oil is loaded onto railroad cars and shipped to locations including Albany, New York, where it is then loaded onto barges for delivery to

refineries. As of 2014, Albany received approximately 20% to 25% of the Bakken crude oil rail exports. ConocoPhillips, including through its subsidiaries acting as its agents, previously owned and operated four refineries that supplied gasoline to the New York Harbor area: the Bayway refinery in New Jersey from approximately 1993-2012, the Trainer refinery in Pennsylvania from approximately 1997-2011, the Sweeny refinery in Texas from approximately 1947-2012, and the Lake Charles refinery in Louisiana from approximately 1941-2012.

29. Exxon, through its subsidiaries, owns and operates gasoline refineries in Baton Rouge, Louisiana; Baytown, Texas; and Beaumont, Texas. Exxon supplies gasoline from those three refineries to the New York Harbor area via the Colonial Pipeline and other related pipelines. Exxon, through its subsidiaries, produces oil in the Bakken formation in North Dakota. On information and belief, this crude oil is loaded onto railroad cars and shipped to locations including Albany, New York, where it is then loaded onto barges for delivery to refineries. There also are numerous Exxon-branded gasoline stations in New York State, including in New York City. Exxon offers credit cards to consumers, through its interactive website, to promote sales of gasoline and other products at its branded gasoline stations. Exxon promotes gasoline sales by offering consumers discounts off every gallon of Synergy™ gasoline at Exxon™ or Mobil™ stations. On information and belief, Exxon also has used New York advertising firms to promote fossil fuel products.

30. Shell, including through its subsidiaries acting as its agents, owns and operates three refineries that supply gasoline to the New York Harbor area. Shell, through its subsidiaries, partially owns and operates a refinery in Deer Park, Texas, where crude oil is refined into finished fossil fuel products, including gasoline, that are supplied to the New York Harbor area. Shell has also owned and operated the Norco refinery in Louisiana, from 1929 to

the present, and the Convent refinery in Louisiana, from 1988 to the present, both of which supply gasoline to the New York Harbor area. Shell previously owned and operated the Port Arthur refinery in Texas from 2002 to 2017, which also supplied gasoline to the New York Harbor area. There are numerous Shell-branded gasoline stations in New York State, including in New York City. Shell offers credit cards to consumers on its interactive website to promote sales of gasoline and other products at its branded gasoline stations. Shell promotes gasoline sales by offering consumers, through its interactive website, twenty-five cents off every gallon of Shell fuel for the first two months after they open an account. In 2010, Shell acquired (through its purchase of a smaller producer known as East Resources) natural gas acreage in New York State. At the time, Shell described the purchased assets as the “premier shale gas play in the Northeast U.S.”<sup>7</sup> While New York State at present prohibits high-volume hydrofracking of natural gas, on information and belief, Shell continues to own and/or control this acreage for future potential exploitation. Shell’s subsidiary and agent, Shell Pipeline Company, LP, is a part-owner of the Colonial Pipeline, which begins in the Gulf Coast area and supplies substantial quantities of gasoline to the northeastern United States, including New York.

### III. JURISDICTION AND VENUE

31. The Court has jurisdiction over the subject matter of this action pursuant to 28 U.S.C. § 1332. Plaintiff is a citizen of New York for purposes of diversity jurisdiction while Defendants are citizens of California, Delaware, New Jersey, Texas, and foreign countries England and the Netherlands. The amount in controversy exceeds \$75,000, exclusive of interest and costs.

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<sup>7</sup> Chris V. Nicholson, *Shell Buying an Oil and Gas Firm for \$4.7 Billion*, N.Y. TIMES, May 28, 2010, available at <http://www.nytimes.com/2010/05/29/business/global/29shell.html>.

32. Venue is proper under 28 U.S.C. § 1391(b), because a substantial part of the events and omissions giving rise to the claims occurred in this district, and because a substantial part of the property that is the subject of the action is situated in this district.

#### IV. CLIMATE CHANGE IMPACTS ON NEW YORK CITY

33. Climate change is happening now and is injuring New York City. Because of the past and continuing conduct of Defendants and other fossil fuel companies that have followed Defendants' lead, and because recent and current emissions remain in the atmosphere for up to hundreds of years, more extreme and injurious impacts are unavoidable. Climate change impacts will continue and will be exacerbated well into the future.<sup>8</sup>

34. The year 2016 was the hottest in modern recorded history, 2015 was the second-hottest year on record, and 2014 was the third hottest; preliminary reports indicate that 2017 is on track to join the top three. Sixteen of the hottest years on record have all occurred since the year 2000. These recent, record-breaking years are part of a long-term trend: since 1970, each of the four decades has been hotter than the one that preceded it, and the last three decades have been hotter than any decade since 1850, when thermometer records began. The United States' most recent National Climate Assessment, a periodic review of the science and impacts in the United States of climate change, issued in November 2017, states that the period 1901 to 2016 "is now the warmest in the history of modern civilization."<sup>9</sup>

35. Global warming is most commonly expressed in terms of a global average temperature change. Until recently, the global average temperature was quite stable over the past

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<sup>8</sup> INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE ("IPCC"), CLIMATE CHANGE 2013, THE PHYSICAL SCIENCE BASIS 1033, *available at* [https://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5\\_Chapter12\\_FINAL.pdf](https://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5_Chapter12_FINAL.pdf).

<sup>9</sup> DONALD J. WUEBBLES ET AL., *2017: Executive Summary*, in CLIMATE SCIENCE SPECIAL REPORT: FOURTH NATIONAL CLIMATE ASSESSMENT, VOLUME I (2017), *available at* <https://science2017.globalchange.gov/chapter/executive-summary/>.

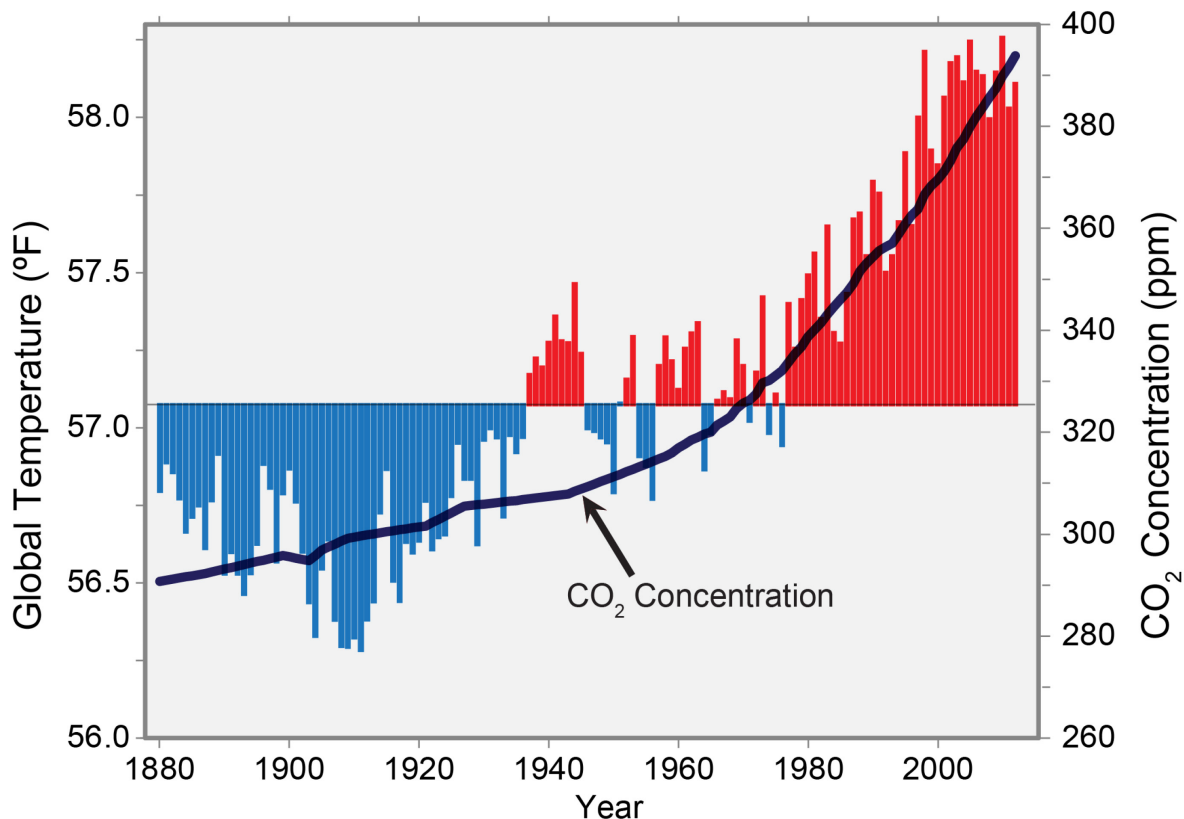


10,000 years. However, the global average temperature has increased over the last century by 1.8°F (1°C)—an extraordinarily rapid and unprecedented rate of change not seen in thousands of years of human history. Most of this warming has occurred since 1970. GHG pollution from the burning of fossil fuels is the dominant cause. By way of comparison, the global average temperature at the depths of the last ice age 20,000 years ago was only about 7°F to 11°F cooler than today, a time when New York City was buried under the Laurentide Ice Sheet. Thus, differences of just a few degrees in global average temperature constitute dramatic changes to our climate, and are the difference between our current climate, an ice age, and the catastrophic changes that global warming threatens to bring in the future. The following graph from the 2017 U.S. National Assessment shows the increase in global average temperature since 1880 with the corresponding buildup of carbon dioxide pollution in the atmosphere:<sup>10</sup>

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<sup>10</sup> John Walsh et al., 2014: *Ch. 2: Our Changing Climate*, in CLIMATE CHANGE IMPACTS IN THE UNITED STATES: THE THIRD NATIONAL CLIMATE ASSESSMENT Fig. 2.2 (J. M. Melillo et al., eds., 2014), available at <https://nca2014.globalchange.gov/report/our-changing-climate/observed-change#graphic-16678>.

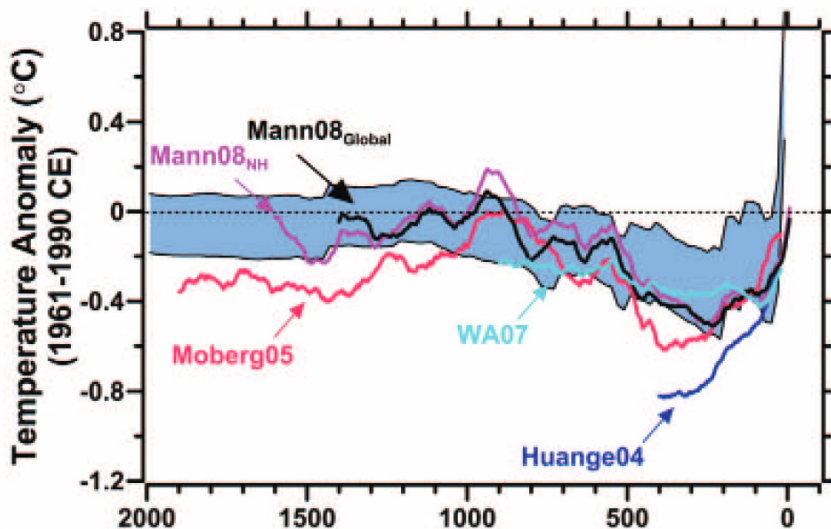
## Global Temperature and Carbon Dioxide



36. The recent, rapid rate of temperature increase compared to the last 2,000 years is shown in the following graph from an article published in the peer-reviewed literature<sup>11</sup> that the federal government relies upon in a website explaining climate change:<sup>12</sup>

<sup>11</sup> Shaun A. Marcott et al., *A Reconstruction of Regional and Global Temperature for the Past 11,300 Years*, 339 SCIENCE 1198, available at <http://science.sciencemag.org/content/339/6124/1198>.

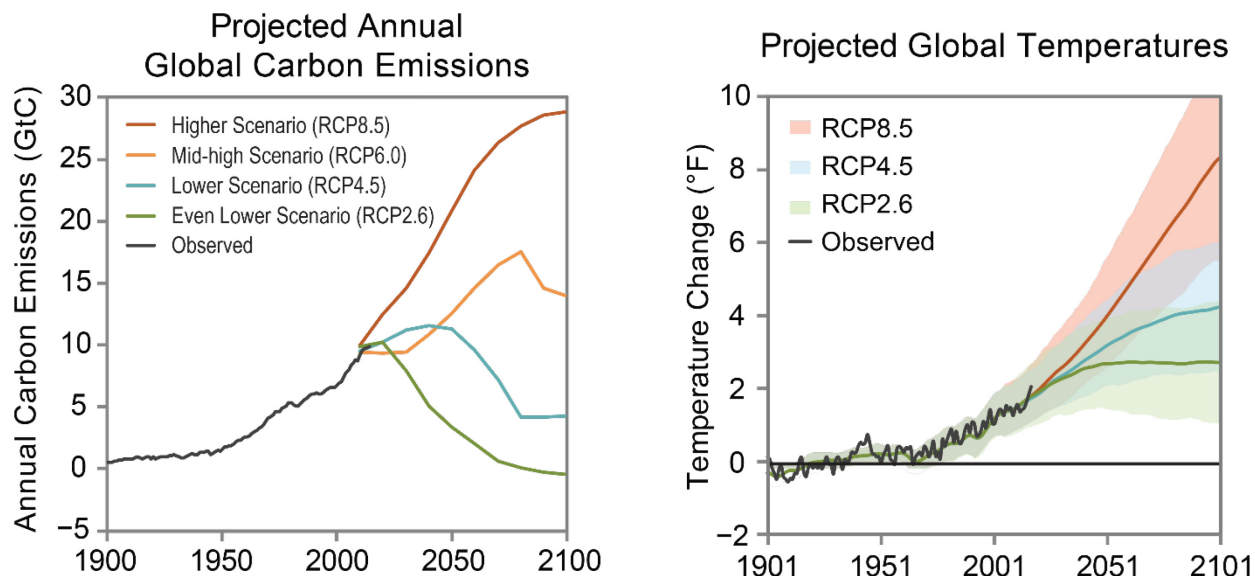
<sup>12</sup> Michon Scott, *What's the Hottest Earth Has Been "Lately"?*, NOAA (Sept. 17, 2014), <https://www.climate.gov/news-features/climate-qa/what%E2%80%99s-hottest-earth-has-been-%E2%80%9Clately%E2%80%9D>.



37. According to the federal government's 2017 U.S. National Assessment, by the end of the century, U.S. warming is projected to be approximately 3°F (1.67°C) to 5°F (2.78°C) for lower emissions scenarios involving substantial reductions in emissions, and 5°F (2.78°C) to 10°F (5.56°C) for higher emissions scenarios that assume continued increases in emissions.<sup>13</sup> This range of GHG pollution and correlating temperature increase is depicted in the following set of graphs from the 2017 National Assessment (with "RCP" standing for "representative concentration pathways," *i.e.*, the future GHG pollution levels):<sup>14</sup>

<sup>13</sup> John Walsh et al., 2014: *Ch. 2: Our Changing Climate*, in CLIMATE CHANGE IMPACTS IN THE UNITED STATES: THE THIRD NATIONAL CLIMATE ASSESSMENT 29 (J. M. Melillo et al., eds., 2014), available at <https://nca2014.globalchange.gov/report/our-changing-climate/recent-us-temperature-trends#narrative-page-16566>.

<sup>14</sup> DONALD J. WUEBBLES ET AL., *supra* note 9, at Fig. 3. The RCPs are standard greenhouse gas concentrations adopted by the IPCC for its fifth Assessment Report ("AR5"). They are based on greenhouse gas concentration trajectories in the atmosphere, and incorporate different assumptions about emissions over the coming decade.



38. With sustained warming in the upper end of the range, the polar ice sheets in Greenland and the West Antarctic would be committed to a long-term, irreversible process of disintegration, eventually resulting in thirty feet or more of sea level rise.<sup>15</sup>

39. The current rate of global warming presents a serious risk of dangerous and potentially catastrophic harms and is on track to exceed a warming of 3.6°F (2°C) within several decades, which is commonly accepted as a point beyond which the most dangerous and even catastrophic consequences of global warming cannot be prevented. The City has recognized that keeping global warming from exceeding a target of 2.7°F (1.5°C) increase is needed for “preventing the worst projected climate impacts, both locally and globally,”<sup>16</sup> and that in all

<sup>15</sup> IPCC, CLIMATE CHANGE 2014: IMPACTS, ADAPTATION, AND VULNERABILITY, SUMMARY FOR POLICYMAKERS 12 n. 35, available at [http://www.ipcc.ch/pdf/assessment-report/ar5/wg2/ar5\\_wgII\\_spm\\_en.pdf](http://www.ipcc.ch/pdf/assessment-report/ar5/wg2/ar5_wgII_spm_en.pdf) (Greenland – between 1 to 4 °C additional warming; 7 meters sea level rise); Jonathan L. Bamber et al., *Reassessment of the Potential Sea-Level Rise from a Collapse of the West Antarctic Ice Sheet*, 324 SCIENCE 901-03 (2009), available at <http://science.sciencemag.org/content/324/5929/901> (West Antarctic -- 3 meters sea level rise).

<sup>16</sup> CITY OF NEW YORK, 1.5 °C, ALIGNING NEW YORK CITY WITH THE PARIS CLIMATE AGREEMENT (Sept. 2017), available at

events keeping global warming below 3.6°F (2°C) is a “critical goal.”<sup>17</sup> For this reason, the City has committed, through issuance of Executive Order 26 of 2017 and via a collaborative effort with other cities, to do its part to reduce its emissions to a level consistent with the goal of keeping the global average temperature increase below 2.7°F (1.5°C).

40. According to the NPCC, the expert committee convened by the City to provide scientific advice, guidance, and projections on climate change and relied upon by the City in its sustainability and resiliency efforts, climate change is already affecting New York City. The average annual temperature in New York City has increased at a rate of 0.79°F per decade over the last 30 years. The NPCC also reported that extreme precipitation events have increased by approximately 70% in the Northeastern United States from 1958 to 2011. Sea level rise in New York City has averaged 1.2 inches per decade (total of 1.1 feet) since 1900, nearly twice the observed global rate of 0.5 to 0.7 inches per decade over a similar time period, and has risen more quickly in New York City in recent decades. While some of this relative sea level rise is attributable to land subsidence, approximately 60% is driven by climate-related factors.

41. The NPCC projects dramatic impacts on New York City in the future. Considering the NPCC’s projections, the City has recognized that “[r]ising sea levels, increased temperatures and precipitation, and a growing likelihood of more intense storms pose unique

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<http://www1.nyc.gov/assets/sustainability/downloads/pdf/publications/1point5-AligningNYCwithParisAgrmtFORWEB.pdf>.

<sup>17</sup> City of New York, Office of the Mayor, Exec. Order No. 26, Climate Action Executive Order (June 2, 2017), *available at* [http://www1.nyc.gov/assets/home/downloads/pdf/executive-orders/2017/eo\\_26.pdf](http://www1.nyc.gov/assets/home/downloads/pdf/executive-orders/2017/eo_26.pdf).

challenges to a coastal city like ours.”<sup>18</sup> It also has recognized that heat “presents a unique challenge to New York City.”<sup>19</sup>

42. The NPCC makes both “middle range” and “high end” projections. Middle range projections are those in the 25th to 75th percentile of possible outcomes, *i.e.*, 25% of the outcomes are at or below the lower end of the range, and 75% of the outcomes are at or below the upper end of the range. High end projections are those for which 90% of the outcomes are at or below the outcome. Middle range projections show that local average temperatures will increase over the 1971-2000 baseline period by 2.0 to 2.8°F by the 2020s, 4.0 to 5.7°F by the 2050s, 5.3 to 8.8°F by the 2080s, and 5.8 to 10.3°F by 2100.<sup>20</sup> This understates the human-driven/fossil fuel warming impact because the baseline period itself (*i.e.* 1971 to 2000) includes a period of significant human-induced warming. Under the “high end” projections, local average temperatures are expected to increase by 3.2°F by the 2020s, 6.6°F by the 2050s, 10.3°F by the 2080s, and 12.1°F by 2100.<sup>21</sup>

43. The projections also show that heat waves will become more frequent and more intense. The NPCC’s “middle range” projections show that the number of days above 90°F in New York City will increase from eighteen days per year in the baseline period (1971-2000) to twenty-six to thirty-one days per year in the 2020s, to thirty-nine to fifty-two days per year in the 2050s, and forty-four to seventy-six days per year in the 2080s. Again, these projections understate the warming impact from fossil fuels because the baseline period itself includes

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<sup>18</sup> CITY OF NEW YORK, *supra* note 2, at 216.

<sup>19</sup> *Id.* at 222.

<sup>20</sup> NEW YORK CITY PANEL ON CLIMATE CHANGE 2015 REPORT CHAPTER 1: CLIMATE OBSERVATIONS AND PROJECTIONS 29 (2015), *available at* <http://onlinelibrary.wiley.com/doi/10.1111/nyas.12586/epdf>.

<sup>21</sup> *Id.* at 30.

significant human-induced warming. The “high end” estimates show temperatures at or above 90°F for thirty-three days per year by the 2020s, for fifty-seven days by the 2050s, and for eighty-seven days by the 2080s.<sup>22</sup> Put differently, by the 2050s, today’s worst heat waves are expected to become ordinary summer days.

44. Heat has a direct impact on total daily deaths, with most heat-related deaths occurring on the same day or shortly after exposure to heat. Without mitigation, hotter summers projected for 2020 could cause an estimated 30% to 70% increase in heat-related deaths, or about 110 to 260 additional heat-related deaths per year on average in New York City. The health consequences of global warming disproportionately affect the City’s most vulnerable populations—the elderly, children, and low-income communities who already experience elevated instances of cardiovascular and respiratory diseases.

45. Global warming exacerbates extreme precipitation, including heavy downpours, because a warmer atmosphere holds more moisture than a cool one, and extreme precipitation from a saturated atmosphere is greater than precipitation from a drier atmosphere. Extreme precipitation events are expected to increase in frequency, intensity, and duration. Comparing the “high end” estimates to the 1971-2000 baseline, the number of days in New York City with rainfall at or above two inches is projected to increase by as much as 67% by the 2020s and the number of days with rainfall at or above four inches is projected to increase by as much as 67% by the 2020s and 133% by the 2080s.<sup>23</sup> This, again, understates the fossil fuel-caused warming impact because the baseline period itself includes human-induced warming.

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<sup>22</sup> *Id.* at 31.

<sup>23</sup> *Id.*

46. An increase in flooding and other climate impacts is expected to impact the City's water supply system by increasing turbidity and eutrophication in the City's reservoirs and their tributaries, necessitating changes to components of water supply operations and drinking water treatment in the future. Climate change threatens to increase the frequency of droughts that would diminish the water available to fill the City's upstate reservoirs. Climate extremes also harm City trees and park flora.

47. The City is exceptionally vulnerable to sea level rise, because its 520-mile coastline is longer than the coastlines of Boston, Los Angeles, Miami, and San Francisco combined, and because New York City has a large floodplain that is home to more than 218,000 New Yorkers, a floodplain that is already likely larger than any other city in the United States, and is growing in size due to global warming-induced sea level rise. The City's waterfront is among its greatest assets, but it is being harmed by global warming and is under dire threat from continued warming due to past and continuing GHG pollution.

48. Global warming-induced sea level rise is expected to be higher in areas surrounding New York City than in many other parts of the world. According to the NPCC's "high end" projection, the sea level surrounding the City is expected to rise above the 2000-2004 baseline level (which already includes climate-change related sea level rise) by ten inches by the 2020s, by thirty inches by the 2050s, by fifty-eight inches by the 2080s, and by seventy-five inches—more than six feet—by 2100.<sup>24</sup> Even the "middle range" projections are dire: four to eight inches by the 2020s, eleven to twenty-one inches by the 2050s, eighteen to thirty-nine

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<sup>24</sup> NEW YORK CITY PANEL ON CLIMATE CHANGE 2015 REPORT CHAPTER 2: SEA LEVEL RISE AND COASTAL STORMS 41 (2015), *available at* <http://onlinelibrary.wiley.com/doi/10.1111/nyas.12593/epdf>.



inches by the 2080s, and twenty-two to fifty inches by 2100. Even without storms, this sea level rise threatens low-lying areas of the City—for example, by the 2050s approximately forty-three miles of the City’s coastline (including many residential neighborhoods) could be at risk of daily or weekly tidal inundation, even during non-storm conditions. And a sea level rise of six feet would put parts of all five boroughs—including portions of the Financial District, Red Hook, and the vast majority of Coney Island and the Rockaways—under water. The City also owns significant infrastructure and numerous facilities along the coast, including roads, bridges, parks, waste transfer stations, and over a dozen wastewater treatment plants, that are at grave risk from sea level rise.

49. Along with sea level rise will come frequent flooding. It is “virtually certain” that sea level rise will lead to coastal flooding in New York City that is more frequent and more intense.<sup>25</sup> According to the NPCC’s “high end” estimate, by the 2080s, what would today be considered a 100-year flood (*i.e.*, a flood that has a 1% chance of occurring in any given year) could have as high as a 12% chance of occurring in any given year, and this flooding could be as much as 4.8 feet higher than today’s 100-year flood because of sea level rise. Even the middle range projections show that a 100-year flood is between two and five times as likely to occur in any given year by 2080, and that the flood will be 1.5 to 3.3 feet higher than today’s 100-year flood because of sea level rise.<sup>26</sup> More recent research published in 2017 indicates that the flood threat to the City is likely to be even worse. According to this research, what would ordinarily be considered a 100-year flood will be likely to occur more than six times per year by 2100 in

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<sup>25</sup> CITY OF NEW YORK, BUILDING A STRONGER, MORE RESILIENT NEW YORK 40-42 (2013), available at [http://s-media.nyc.gov/agencies/sirr/SIRR\\_singles\\_Hi\\_res.pdf](http://s-media.nyc.gov/agencies/sirr/SIRR_singles_Hi_res.pdf).

<sup>26</sup> NEW YORK CITY PANEL ON CLIMATE CHANGE, *supra* note 24, at 41.

the City, or approximately once every two months, under a future with continued high emissions of GHG pollution.<sup>27</sup> Under this same scenario, the 500-year flood—a truly massive flood that today would be associated with an apocalyptic storm—would be likely to occur in the City approximately every 18 months.<sup>28</sup>

50. The impacts of this flooding would be catastrophic. By the 2020s under the NPCC’s “high end” projections, the area that could be flooded in a 100-year storm would expand to 59 square miles, encompassing approximately 88,000 buildings and much of the City’s international airport.<sup>29</sup> By the 2050s, with more than 2.5 feet of sea level rise, the City’s 100-year floodplain would expand to 72 square miles, or nearly a quarter of the City, and would include approximately 114,000 buildings, 97% of the City’s power generation, 20% of its hospital beds, a large share of its public housing, and 10% of its overall population.<sup>30</sup> This is significantly more than the fifty-one square miles flooded during Hurricane Sandy. The map below shows the areas that are at risk of flooding from a 100-year storm under the NPCC’s “high end” sea level rise projections within reasonable scientific uncertainty ranges:

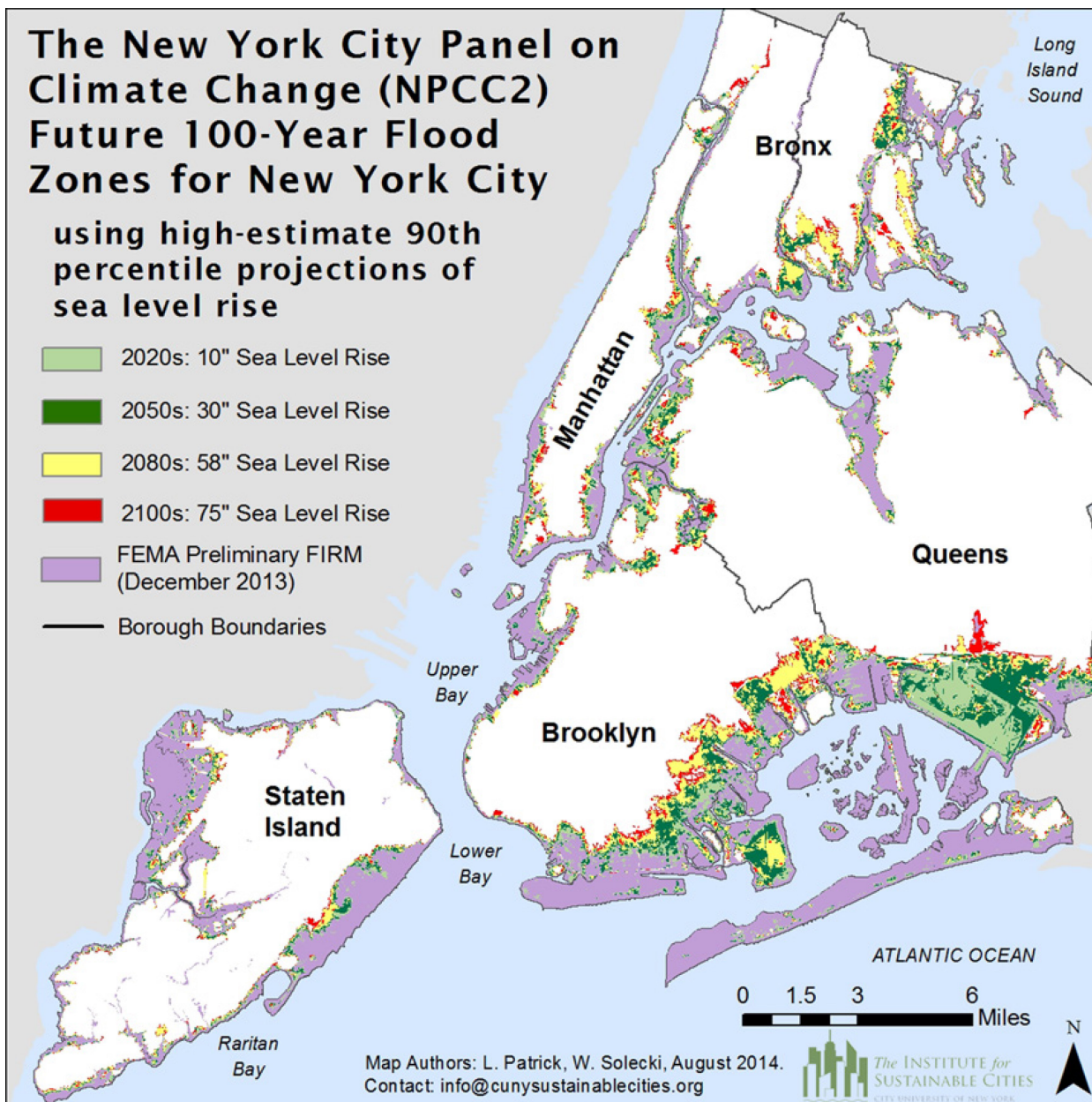
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<sup>27</sup> Maya K. Buchanan et al., *Amplification of Flood Frequencies with Local Sea Level Rise and Emerging Flood Regimes*, ENVTL. RES. LETT. S-11 (2017), available at [http://iopscience.iop.org/1748-9326/12/6/064009/media/ERL\\_12\\_6\\_064009\\_suppdata.pdf](http://iopscience.iop.org/1748-9326/12/6/064009/media/ERL_12_6_064009_suppdata.pdf).

<sup>28</sup> *Id.*

<sup>29</sup> NYC OFFICE OF EMERGENCY MANAGEMENT, 2014 NYC HAZARD MITIGATION PLAN 243-44 (2014), available at [http://www.nyc.gov/html/oem/downloads/pdf/hazard\\_mitigation/plan\\_update\\_2014/final\\_draft\\_nyc\\_hmp.pdf](http://www.nyc.gov/html/oem/downloads/pdf/hazard_mitigation/plan_update_2014/final_draft_nyc_hmp.pdf). These projections are based on the 2013 Preliminary Work Maps, a set of maps developed by FEMA in preparation for the promulgation of the 2015 Preliminary Flood Maps, which are now being revised by FEMA.

<sup>30</sup> *Id.* at 243-44.



51. The global warming-induced sea level rise caused by past fossil fuel consumption is an irreversible condition on any relevant time scale: it will last hundreds or even thousands of years. Temperature increases from GHG emissions take decades to manifest themselves because the oceans warm slowly. And once the temperature increases are fully realized, they are essentially irreversible. Time lags and inertia in the climate system mean that impacts will become more severe for years in the future due to past and continuing GHG pollution. Future

emissions will create long-term impacts that are even more dramatic, particularly now that the planet's natural buffering (such as ocean uptake of carbon that would otherwise be in the atmosphere) has begun to decline in efficacy. As the NPCC put it, "sea level rise is projected to accelerate into the 22nd century even if heat-trapping GHG concentrations stabilize later this century."<sup>31</sup> Defendants' current, continuing, and planned production of fossil fuels into the future will further exacerbate global warming, accelerate sea level rise, and require greater and more costly projects and actions to protect the City.

## V. FOSSIL FUELS ARE THE PRIMARY CAUSE OF CLIMATE CHANGE

52. Climate science clearly demonstrates that humans—and the burning of fossil fuels—are causing these changes to the climate. According to the Intergovernmental Panel on Climate Change ("IPCC"), "the leading international scientific authority on climate change" as even Exxon has admitted, it is "extremely likely" (*i.e.*, 95-100% certain) that "human influence has been the dominant cause of the observed warming since the mid-20th century."<sup>32</sup> Man-made climate change affects every aspect of the climate system. According to the IPCC, "[h]uman influence has been detected in warming of the atmosphere and the ocean, in changes in the global water cycle, in reductions in snow and ice, in global mean sea level rise, and in changes in some climate extremes."<sup>33</sup> The NPCC findings are in agreement with what the NASA Goddard Institute for Space Studies has described as the "numerous international and national reports" that recently "have concluded that human activities are changing the climate, leading to

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<sup>31</sup> NEW YORK CITY PANEL ON CLIMATE CHANGE, *supra* note 24, at 42.

<sup>32</sup> INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2014: SYNTHESIS REPORT 47 (2014), *available at* [http://www.ipcc.ch/pdf/assessment-report/ar5/syr/SYR\\_AR5\\_FINAL\\_full\\_wcover.pdf](http://www.ipcc.ch/pdf/assessment-report/ar5/syr/SYR_AR5_FINAL_full_wcover.pdf).

<sup>33</sup> *Id.*

increased vulnerability and risk.”<sup>34</sup> Similarly, NASA’s website states that a “scientific consensus” exists that “[c]limate-warming trends over the past century are extremely likely due to human activities,” noting agreement among more than 97% of climate scientists and “most of the leading scientific organizations,” including the American Association for the Advancement of Science, the American Geophysical Union, the American Meteorological Society, the American Physical Society, the Geological Society of America, and the National Academy of Sciences, as well as a large number of international scientific societies.<sup>35</sup>

53. And the science also shows that fossil fuel combustion is the primary driver of climate change. Carbon dioxide emitted from fossil fuel combustion bears a chemical fingerprint that differentiates it from natural sources of carbon dioxide. Thus, it is a scientific certainty that the current increase in carbon dioxide in the atmosphere is caused by fossil fuel pollution, and that natural processes, including human and animal exhalation, are not a cause of the problem. Atmospheric levels of carbon dioxide, a greenhouse gas, have increased by 40% since the pre-industrial era. These concentrations are now higher than at any time in the last three million years. As the IPCC has confirmed, this unprecedented increase in carbon dioxide levels constitutes “[t]he largest contribution” to climate change of any source, and comes “primarily from fossil fuel emissions.”<sup>36</sup> The National Academy of Sciences has also confirmed that “the

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<sup>34</sup> *Publication Abstracts: Horton et al. 2015*, NAT’L AERONAUTICS & SPACE ADMIN., <https://pubs.giss.nasa.gov/abs/ho00600i.html> (last visited Jan. 9, 2018) (citations omitted).

<sup>35</sup> *Scientific Consensus: Earth’s Climate is Warming*, NAT’L AERONAUTICS & SPACE ADMIN., <https://climate.nasa.gov/scientific-consensus/> (last visited Jan. 9, 2018).

<sup>36</sup> INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2013, THE PHYSICAL SCIENCE BASIS, SUMMARY FOR POLICYMAKERS 11, 13, *available at* [https://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5\\_SPM\\_FINAL.pdf](https://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5_SPM_FINAL.pdf).

rise in CO<sub>2</sub> is largely from combustion of fossil fuels.”<sup>37</sup> Warming from greenhouse gases has a signature, including a differential warming of the upper and lower levels of the atmosphere, that rules out natural explanations for climate change. According to the federal government’s Fourth National Climate Assessment, “human activities, especially emissions of greenhouse gases, are the dominant cause of the observed warming since the mid-20th century.”<sup>38</sup> The 2017 Assessment stated that there is a “*likely* human contribution of 93%–123% of the observed 1951–2010 change” in warming, with the range above 100% indicating that natural processes would have produced a cooling effect but were overwhelmed by man-made global warming.<sup>39</sup> “Likely” is a term defined by the US National Climate Assessment as a 66%-100% chance of being true.

54. In addition, atmospheric concentrations of methane, another important greenhouse gas emitted through fossil fuel use, are 150% higher than in pre-industrial times, and higher than any time in the last 800,000 years.

55. The basic facts of the greenhouse effect have been known for a long time. In 1896, Svante Arrhenius, a Nobel-prize winning scientist, published calculations projecting temperature increases that would be caused by burning fossil fuels.<sup>40</sup> By 1957, scientists at the Scripps Research Institute published a warning in peer-reviewed literature that global warming “may become significant during future decades if industrial fuel combustion continues to rise

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<sup>37</sup> THE ROYAL SOCIETY & THE NATIONAL ACADEMY OF SCIENCES, CLIMATE CHANGE: EVIDENCE AND CAUSES 6, 8 (2014), *available at* <http://dels.nas.edu/resources/static-assets/exec-office-other/climate-change-full.pdf>.

<sup>38</sup> WUEBBLES ET AL., *supra* note 9, at 1.

<sup>39</sup> *Id.* at 14.

<sup>40</sup> Svante Arrhenius, *On the Influence of Carbonic Acid in the Air Upon the Temperature of the Ground*, 41 PHIL. MAG. & J. OF SCIENCE 237, 237-76 (1896), *available at* [http://www.rsc.org/images/Arrhenius1896\\_tcm18-173546.pdf](http://www.rsc.org/images/Arrhenius1896_tcm18-173546.pdf).

exponentially” and that “[h]uman beings are now carrying out a large scale geophysical experiment” on the planet.<sup>41</sup> By 1960, published data established that carbon dioxide concentrations in the atmosphere were in fact rising.<sup>42</sup> In 1965, the President’s Science Advisory Committee reported that “[p]ollutants have altered on a global scale the carbon dioxide content of the air,”<sup>43</sup> and that the effects “could be deleterious from the point of view of human beings.”<sup>44</sup> The report stated that fossil fuel combustion is “measurably increasing the atmospheric carbon dioxide” and concluded that humans are “conducting a vast geophysical experiment” due to their massive fossil fuel consumption.<sup>45</sup> In 1979, the National Academy of Sciences, which is charged with providing independent scientific advice to the United States government, concluded that there was “incontrovertible evidence” that carbon dioxide levels were increasing in the atmosphere as a result of fossil fuel use, and predicted that a doubling of atmospheric carbon dioxide would cause a probable increase in global average surface temperatures of 3°C, or 5.4°F.<sup>46</sup> In 1988, NASA scientist Dr. James E. Hansen testified to the

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<sup>41</sup> Roger Revelle & Hans E. Suess, *Carbon Dioxide Exchange between Atmosphere and Ocean and the Question of an Increase of Atmospheric CO<sub>2</sub> During the Past Decades*, 9 TELLUS 18, 18-27 (1957), available at <http://onlinelibrary.wiley.com/doi/10.1111/j.2153-3490.1957.tb01849.x/epdf>.

<sup>42</sup> Charles D. Keeling, *The Concentration and Isotopic Abundances of Carbon Dioxide in the Atmosphere*, 12 TELLUS 200, 200-203 (1960), available at <http://onlinelibrary.wiley.com/doi/10.1111/j.2153-3490.1960.tb01300.x/epdf>.

<sup>43</sup> PRESIDENT’S SCIENCE ADVISORY PANEL, RESTORING THE QUALITY OF OUR ENVIRONMENT 1 (Nov. 1965), available at <http://dgs.stanford.edu/labs/caldeiralab/Caldeira%20downloads/PSAC,%201965,%20Restoring%20the%20Quality%20of%20Our%20Environment.pdf>.

<sup>44</sup> *Id.* at 126-27.

<sup>45</sup> *Id.* at 113, 126.

<sup>46</sup> See CARBON DIOXIDE AND CLIMATE: A SCIENTIFIC ASSESSMENT, REPORT OF AN AD HOC STUDY GROUP ON CARBON DIOXIDE AND CLIMATE TO THE CLIMATE RESEARCH BOARD, ASSEMBLY OF MATHEMATICAL AND PHYSICAL SCIENCES, NATIONAL RESEARCH COUNCIL vii, 16 (1979), available at <https://www.nap.edu/catalog/12181/carbon-dioxide-and-climate-a-scientific-assessment>.

U.S. Senate that “the greenhouse effect has been detected, and it is changing our climate now.”<sup>47</sup> In 1990, an international collaboration of scientists working under the auspices of the Stockholm Environment Institute to provide information to assist the work of the IPCC issued a report finding that “[a]n absolute temperature limit of 2.0 ° C can be viewed as an upper limit beyond which the risks of grave damage to ecosystems, and of non-linear responses, are expected to increase rapidly.” In 1990, the IPCC reported that increasing CO<sub>2</sub> concentrations from human activity “will enhance the greenhouse effect, resulting on average in an additional warming of the Earth’s surface,”<sup>48</sup> and would cause substantial sea level rise.<sup>49</sup> By 1995, the IPCC had identified “a discernible human influence on global climate,” *i.e.*, a global temperature change caused by GHG pollution, that was already occurring. The IPCC confirmed this finding in 2001, and it was reviewed and confirmed again that same year by the U.S. National Academy of Sciences.<sup>50</sup> Upon information and belief, Defendants have maintained scientific staffs for decades who have kept track of the climate science as these warnings and conclusions have been issued.

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<sup>47</sup> *Greenhouse Effect and Global Climate Change: Hearing Before the Comm. on Energy and Natural Resources* 40 (1988) (statement of Dr. James Hansen, Director, NASA Goddard Institute for Space Studies), *available at* <https://www.scribd.com/doc/260149292/Transcript-of-pivotal-climate-change-hearing-1988>.

<sup>48</sup> INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE: THE IPCC SCIENTIFIC ASSESSMENT, POLICYMAKERS SUMMARY xi (1990), *available at* [https://www.ipcc.ch/ipccreports/far/wg\\_I/ipcc\\_far\\_wg\\_I\\_spm.pdf](https://www.ipcc.ch/ipccreports/far/wg_I/ipcc_far_wg_I_spm.pdf).

<sup>49</sup> *Id.*

<sup>50</sup> NATIONAL ACADEMY OF SCIENCES, COMMISSION ON GEOSCIENCES, ENVIRONMENT & RESOURCES, CLIMATE CHANGE SCIENCE: AN ANALYSIS OF SOME KEY QUESTIONS 1 (2001), *available at* [https://download.nap.edu/cart/download.cgi?record\\_id=10139](https://download.nap.edu/cart/download.cgi?record_id=10139).



**VI. DEFENDANTS HAVE PRODUCED MASSIVE QUANTITIES OF FOSSIL FUELS—  
AND HAVE CONTINUED TO DO SO EVEN AS CLIMATE CHANGE HAS BECOME  
GRAVELY DANGEROUS**

56. For many years, Defendants have produced massive quantities of fossil fuels, including oil and natural gas. They have done so by extracting raw fossil fuels from the ground, refining and processing the raw fuels into forms that can be combusted, and marketing these products to consumers.

57. When combusted, these fossil fuels emit carbon dioxide. Additionally, one of Defendants' primary fossil fuel products, natural gas, is composed of methane, which is the second largest GHG contributor to global warming and which, as Defendants know, routinely escapes into the atmosphere from facilities operated by Defendants' customers and other fuel consumers.

58. Greenhouse gas molecules cannot be traced to their source, and greenhouse gases quickly diffuse and commingle in the atmosphere. However, because of their rapid and widespread global dispersal, greenhouse gas emissions from each of Defendants' fossil fuel products are present in the atmosphere in New York State.

59. Defendants are substantial contributors to the climate change that is causing injury to the City and thus are jointly and severally liable. Defendants' cumulative production of fossil fuels over many years makes each Defendant among the top sources of GHG pollution in the world. Upon information and belief, Defendants are, respectively, the first (Chevron), second (Exxon), fourth (BP), sixth (Shell), and ninth (ConocoPhillips) largest cumulative producers of fossil fuels worldwide from the mid-nineteenth century to present; most of Defendants' GHG pollution from the use of their fuels has occurred since 1980.

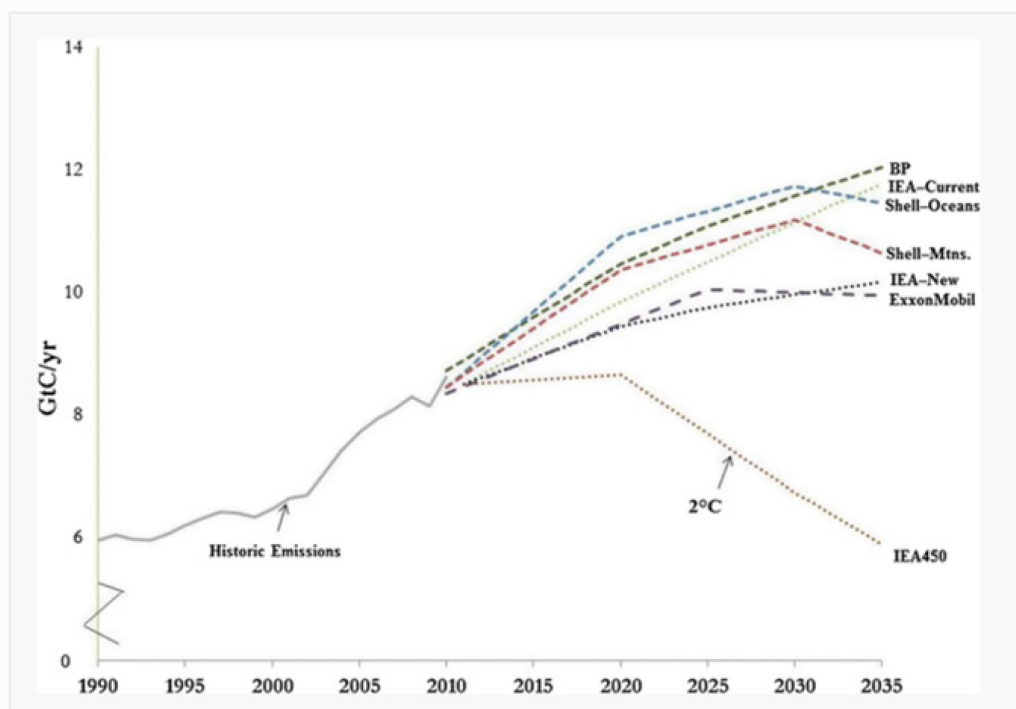
60. Individually and collectively, Defendants' production, marketing, sale, and promotion of fossil fuel products are responsible for climate change impacts which harm New York City.

61. Defendants have in the last ten years or more produced large amounts of unconventional, high carbon-intensity fossil fuels—*i.e.*, fuels that are responsible for more carbon emitted per unit of energy than other fuels, and that therefore contribute disproportionately to global warming. For example, Chevron, Exxon, BP, and ConocoPhillips produce significant amounts of fossil fuels from tar sands in Canada. Shell, until recently, was also responsible for significant tar sands production. Exxon has publicly promoted tar sands production as “a significant, secure energy source for the United States,” and ConocoPhillips has said this production is “a significant part of the world’s energy future.”<sup>51</sup>

62. Defendants' conduct will continue to cause ongoing and increasingly severe harm to the City because Defendants are committed to a business model of massive fossil fuel production that they know causes a gravely dangerous rate of climate change. The following graph from a 2015 study published in the peer-reviewed scientific literature demonstrates that the actions of Defendants BP, Shell, and Exxon dramatically diverge from those necessary to protect human safety and welfare.

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<sup>51</sup> *Canadian Oil Sands*, EXXON, <http://aboutnaturalgas.com/en/current-issues/oil-sands/canadian-oil-sands/overview> (last visited Jan. 9, 2018); *Oil Sands*, CONOCOPHILLIPS CANADA, <http://www.conocophillips.ca/our-operations/oil-sands/Pages/default.aspx> (last visited Jan. 9, 2018).



The graph compares BP, Exxon, and Shell’s projections of worldwide total future GHG emissions<sup>52</sup>—projections upon which they make long-term business plans—to the International Energy Agency (“IEA”) 450 trajectory. The IEA 450 emissions trajectory line shown in this graph represents the emissions reductions that would be necessary in the future to prevent global warming from exceeding a 2°C increase over the pre-industrial temperature, which, as stated above, is commonly accepted as a point beyond which the most dangerous and even catastrophic consequences of climate change cannot be prevented.<sup>53</sup> Upon information and belief, all Defendants base their long-term business plans upon similar projections.

## VII. DEFENDANTS HAD FULL KNOWLEDGE THAT FOSSIL FUELS WOULD CAUSE CATASTROPHIC HARM

63. For decades, Defendants have known that their fossil fuel products pose risks of “severe” and even “catastrophic” impacts on the global climate through the work and warnings

<sup>52</sup> In gigatons of carbon per year.

<sup>53</sup> Peter C. Frumhoff et al., *The Climate Responsibilities of Industrial Carbon Producers*, 132 CLIMATIC CHANGE 157, 167 (2015), available at <https://link.springer.com/article/10.1007/s10584-015-1472-5>.

of their own scientists and/or through their trade association, the API. Defendants, large and sophisticated companies devoted to researching significant issues relevant to fossil fuels, also were aware of significant scientific reports on climate change science and impacts at the time they were issued. Yet each Defendant decided to continue its conduct and commit itself to massive fossil fuel production. This deliberate decision placed company profits ahead of human safety, well-being, and property, and foisted onto the public the costs of abating and adapting to climate change.

64. The API is a national trade association that represents the interests of America's oil and natural gas industry, including foreign-based companies that produce and market fossil fuels in the United States.

65. Beginning in the 1950s, the API began warning its members that fossil fuels pose a grave threat to the global climate. The API's warnings to Defendants included the following:

a. In 1951, the API launched a project to research air pollution from petroleum products that examined the fossil fuel fingerprint of carbon dioxide emissions to determine the amount of atmospheric GHG pollution from fossil fuels.

b. In 1968, a scientific consultant retained by the API reported that carbon dioxide emissions were "almost certain" to produce "significant" temperature increases by 2000, and that these emissions were almost certainly attributable to fossil fuels. The report warned:

If the Earth's temperature increases significantly, a number of events might be expected to occur including the melting of the Antarctic ice cap, a rise in sea levels, warming of the oceans and an increase in photosynthesis. . . . It is clear that we are unsure as to what our long-lived pollutants are doing to our environment; however, there seems to be no doubt that the potential damage to

our environment could be severe . . . [T]he prospect for the future must be of serious concern.<sup>54</sup>

c. Between 1979 and 1983, the API and Defendants, their predecessors, and/or agents formed a task force to monitor and share climate research, initially called the “CO<sub>2</sub> and Climate Task Force” and later renamed the “Climate and Energy Task Force” (“Task Force”). The API kept and distributed meeting minutes to Task Force members. Task Force members included, in addition to API representatives, scientists from Amoco (a predecessor to BP); Standard Oil of California, Texaco, and Gulf Oil Corp. (predecessors to Chevron); Exxon Research and Engineering and Mobil (predecessors to or subsidiaries of current Exxon); Shell; and others. In 1980, the Task Force invited Dr. J.A. Laurman, a “recognized expert in the field of CO<sub>2</sub> and climate,” to make a presentation. Dr. Laurman’s written presentation informed the Task Force that there was a “SCIENTIFIC CONSENSUS ON THE POTENTIAL FOR LARGE FUTURE CLIMATIC RESPONSE TO INCREASED CO<sub>2</sub> LEVELS.” He further informed the Task Force that, though the exact temperature increases were difficult to predict, the “physical facts agree on the probability of large effects 50 years away.” He warned the Task Force of a 2.5°C (4.5°F) global temperature rise by 2038, which would likely have “MAJOR ECONOMIC CONSEQUENCES” and a 5°C (9°F) rise by 2067, which would likely produce “GLOBALLY CATASTROPHIC EFFECTS.” He also suggested that, despite lack of certainty,

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<sup>54</sup> ELMER ROBINSON & R.C. ROBBINS, SOURCES, ABUNDANCE, AND FATE OF GASEOUS ATMOSPHERIC POLLUTANTS, SRI Project PR-6755, prepared for American Petroleum Institute, at 109-110, *available at* <https://www.smokeandfumes.org/#/documents/document16>. In 1972, API members, including Defendants, received a summary of this report. AMERICAN PETROLEUM INSTITUTE, ENVIRONMENTAL RESEARCH: A STATUS REPORT (Jan. 1972), *available at* <http://files.eric.ed.gov/fulltext/ED066339.pdf>.

“THERE IS NO LEEWAY” in the time for acting. API minutes show that the Task Force discussed topics including “the technical implications of energy source changeover,” “ground rules for energy release of fuels and the cleanup of fuels as they relate to CO<sub>2</sub> creation,” and researching “the Market Penetration Requirements of Introducing a New Energy Source into World Wide Use.” The Task Force even asked the question “what is the 50 year future of fossil fuels?”<sup>55</sup>

d. In March 1982, an API-commissioned report estimated the average increase in global temperature from a doubling of atmospheric concentrations of CO<sub>2</sub> and projected, based upon computer modeling, global warming of between 2°C and 3.5°C (3.6°F and 6.3°F). The report projected potentially “serious consequences for man’s comfort and survival,” and noted that “the height of the sea level can increase considerably.”<sup>56</sup>

66. On information and belief, Defendants were aware of the industry Task Force and API findings described above, which were distributed by the API to its members. Each Defendant (or its predecessor) was a member of the API at relevant times, or had a subsidiary that was a member of the API at relevant times. Each subsidiary passed on information it learned from the API on climate change to its parent Defendant (or Defendant’s predecessor) and acted as the agent for its parent company, which remained in charge of setting overall production levels in light of climate change and other factors.

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<sup>55</sup> CO<sub>2</sub> and Climate Task Force, Minutes of Meeting, 1-2 & Attachment B (1980) (emphasis in original), *available at* <http://insideclimatenews.org/sites/default/files/documents/AQ-9%20Task%20Force%20Meeting%20%281980%29.pdf>.

<sup>56</sup> AMERICAN PETROLEUM INSTITUTE, CLIMATE MODELS AND CO<sub>2</sub> WARMING: A SELECTIVE REVIEW AND SUMMARY (March 1982), *available at* <https://assets.documentcloud.org/documents/2805626/1982-API-Climate-Models-and-CO2-Warming-a.pdf>.

67. On information and belief, each Defendant was also actually aware (at the time they were made) of public statements on climate change described above, including the 1979 National Academy of Science findings and Dr. Hansen's 1988 testimony. Because these statements were centrally relevant to Defendants' ongoing investment of billions of dollars in fossil fuel production and billions of dollars in profits, and because Defendants employed many experts charged with evaluating climate change and other energy and regulatory trends, Defendants were in a superior position to appreciate the threat described in these statements. Defendants' representatives attended congressional hearings on climate change beginning as early as the late 1970s.

68. In addition to the API information, some of Defendants produced their own internal analyses of climate change. For example, newly disclosed documents demonstrate that Exxon knew in the late 1970s and early 1980s that its products posed a "catastrophic" threat to the global climate, and that fossil fuel use would have to be significantly reduced to avoid severe harm.

69. Exxon management was informed by its scientists in 1977 that there was an "overwhelming[]" consensus that fossil fuels were responsible for atmospheric carbon dioxide increases. The presentation summarized a warning from a recent international scientific conference that "IT IS PREMATURE TO LIMIT USE OF FOSSIL FUELS BUT THEY SHOULD NOT BE ENCOURAGED." The scientist presenting the material warned management, "Present thinking holds that man has a time window of five to ten years before the need for hard decisions regarding changes in energy strategies might become critical."<sup>57</sup>

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<sup>57</sup> Memorandum from J.F. Black, Products Research Division, Exxon Research and Engineering Co., to F.G. Turpin, Vice President, Exxon Research and Engineering Co. (June 6, 1978),

70. In a 1979 Exxon internal memo, an Exxon scientist calculated that 80% of fossil fuel reserves would need to remain in the ground and unburned to avoid greater than a doubling of atmospheric carbon dioxide.<sup>58</sup>

71. In a 1981 internal Exxon memo, a scientist and director at the Exxon Research and Engineering Company, Roger Cohen, warned that “it is distinctly possible” that CO<sub>2</sub> emissions from Exxon’s fifty-year Corporate Planning Department scenario of fossil fuel use “will later produce effects which will indeed be catastrophic (at least for a substantial fraction of the earth’s population).”<sup>59</sup>

72. A year later, the same scientist wrote another memo to Exxon headquarters, which reported on a “clear scientific consensus” that “a doubling of atmospheric CO<sub>2</sub> from its pre-industrial revolution value would result in an average global temperature rise of  $(3.0 \pm 1.5) ^\circ\text{C}$  [2.7 °F to 8.1 °F].” The clear scientific consensus was based upon computer modeling, a technique Exxon would later publicly attack over a period of decades as unreliable and uncertain in an effort to undermine public confidence in climate science. The memo continued: “There is unanimous agreement in the scientific community that a temperature increase of this magnitude

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*available at*

[https://insideclimatenews.org/system/files\\_force/documents/James%20Black%201977%20Presentation.pdf?download=1](https://insideclimatenews.org/system/files_force/documents/James%20Black%201977%20Presentation.pdf?download=1).

<sup>58</sup> Memorandum from W.L. Ferrall to R. L. Hirsch, Exxon Research and Engineering Co. (Oct. 16, 1979), at 5, *available at*

<http://insideclimatenews.org/sites/default/files/documents/CO2%20and%20Fuel%20Use%20Projections.pdf>.

<sup>59</sup> Memorandum from R. W. Cohen to W. Glass, Exxon Research and Engineering Co. (Aug. 18, 1981), *available at*

<http://insideclimatenews.org/sites/default/files/documents/%2522Catastrophic%2522%20Effects%20Letter%20%281981%29.pdf>.



would bring about significant changes in the earth's climate, including rainfall distribution and alterations in the biosphere.”<sup>60</sup>

73. In November 1982, an Exxon internal report to management warned that “substantial climatic changes” could occur if the average global temperature rose “at least 1 °C [1.8 °F] above [1982] levels,” and that “[m]itigation of the ‘greenhouse effect’ would require major reductions in fossil fuel combustion.” The report then warned Exxon management that “there are some potentially catastrophic events that must be considered,” including the risk that “if the Antarctic ice sheet which is anchored on land should melt, then this could cause a rise in sea level on the order of 5 meters.” The report included a graph demonstrating the expected future global warming from the “CO<sub>2</sub> effect” demonstrating a sharp departure from the “[r]ange of natural fluctuations.”<sup>61</sup> This graph is attached as Exhibit 1.

74. By 1983, Exxon had created its own climate models, which confirmed the main conclusions from the earlier memoranda. Starting by at least the mid-1980s, Exxon used its own climate models and governmental models to gauge the impact that climate change would have on its own business operations. Exxon and other major oil and gas companies, including Mobil and Shell, subsequently took actions to protect their own business assets based on these modeling results, including raising the decks of offshore platforms, protecting pipelines from increasing coastal erosion, and designing helipads, pipelines, and roads in the warming Arctic.<sup>62</sup> In 1994, for example, Shell, Exxon, Conoco, and other oil and gas companies included climate change

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<sup>60</sup> Memorandum from M. B. Glaser to R. W. Cohen et al. (Nov. 12, 1982), at 2, 12-13, 28, available at <https://insideclimatenews.org/sites/default/files/documents/1982%20Exxon%20Primer%20on%20CO2%20Greenhouse%20Effect.pdf>.

<sup>61</sup> *Id.*

<sup>62</sup> Amy Lieberman & Susanne Rust, *Big Oil Braced for Global Warming While it Fought Regulations*, L.A. TIMES, Dec. 31, 2015, available at <http://graphics.latimes.com/oil-operations/>.

projections in their design of a natural gas pipeline leading from a North Sea offshore platform to the German coastline. In other words, the oil and gas industry, including Defendants, were engaging in climate change adaptation and resiliency measures decades ago, at the very same time they were pursuing a campaign designed to convince the public that the science was too uncertain to warrant fossil fuel reductions. These are precisely the same kinds of climate change adaptation and resiliency measures—elevating and hardening infrastructure to protect against sea level rise—that the City must now undertake in order to protect itself.

75. Exxon’s early research and understanding of the climate change impacts of its business was not unique among Defendants. For example, at least as far back as 1970, Defendants Shell and BP began funding scientific research in England to examine the possible future climate changes from greenhouse gas emissions. Shell produced a film on climate change in 1991, in which it admitted that there had been a “marked increase [in global temperatures] in the 1980s” and that the increase “does accord with computer models based on the known atmospheric processes and predicted buildup of greenhouse gases.” It acknowledged a “serious warning” that had been “endorsed by a uniquely broad consensus of scientists” in 1990. In the film, Shell further admitted that by 2050 continued emissions of greenhouse gases at high levels would cause a global average temperature increase of 1.5 to 4°C (2.7 to 7.2°F); that one meter of sea level rise was likely in the next century; that “this could be disastrous;” and that there is a “possibility of change faster than at any time since the end of the ice age, change too fast, perhaps, for life to adapt without severe dislocation.”<sup>63</sup>

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<sup>63</sup> *Royal Dutch Shell, Climate of Concern* (1991), available at <https://www.youtube.com/watch?v=0VOWi8oVXmo>.

**VIII. DESPITE THEIR EARLY KNOWLEDGE THAT CLIMATE CHANGE POSED GRAVE THREATS, DEFENDANTS PROMOTED FOSSIL FUELS FOR PERVASIVE USE, WHILE DENYING OR DOWNPLAYING THESE THREATS**

76. Defendants have extensively promoted fossil fuel use in two ways. First, Defendants misled the public about climate change by over-emphasizing the uncertainties of climate science despite their knowledge that the fundamental science of climate change was well established and amply sufficient to warrant reductions in fossil fuel usage, including by using paid denialist groups and individuals. Defendants' campaign inevitably and intentionally encouraged fossil fuel consumption at levels that were (as Defendants knew) certain to severely harm the public. Second, Defendants promoted fossil fuels through frequent advertising, including promotions claiming that consumption at current and even expanded levels is "responsible" or even "respectful" of the environment. These promotions encouraged continued fossil fuel consumption at levels that Defendants knew would harm the public.

**A. Defendants engaged in an overt public relations campaign intended to cast doubt on climate science and promote their products.**

77. Notwithstanding Defendants' early knowledge of climate change, Defendants have engaged in advertising and communications campaigns intended to promote their fossil fuel products by downplaying the harms and risks of climate change. Initially, the campaign tried to show that climate change was not occurring or was not caused by Defendants' products. More recently, the campaign has sought to minimize the risks and harms from climate change. The campaign's purpose and effect has been to help Defendants continue to produce fossil fuels and sell their products on a massive scale. This campaign was executed in large part by front groups funded by Defendants, either directly or through the API, and through statements made by Defendants directly.

78. One front group was the Global Climate Coalition (“GCC”). The GCC operated between 1989 and 2002. Its members included the API and predecessors or subsidiaries of Defendants, with such subsidiaries acting as Defendants’ agents. On information and belief, these members included BP America Inc. (a BP subsidiary that BP identifies as its U.S. agent); Amoco Corporation and the Atlantic Richfield Company (predecessors of BP); Texaco Inc. (a predecessor of Chevron) as well as Chevron itself; Phillips Petroleum (a predecessor of ConocoPhillips) and later ConocoPhillips itself; Exxon and its predecessors; and Shell Oil Company (Shell’s main U.S. subsidiary). William O’Keefe, former president of the GCC, was also a former executive of the API; the first GCC director was an executive employed by Phillips Petroleum.

79. The GCC spent millions of dollars on campaigns to discredit climate science, including \$13 million on one advertising campaign alone. In this campaign, the GCC distributed a video to hundreds of journalists claiming that carbon dioxide emissions would increase crop production and feed the hungry people of the world.

80. However, internal GCC documents admitted that their “contrarian” climate theories were unfounded. In December 1995, the GCC’s Science and Technology Advisory Committee (“GCC-STAC”), whose members included employees of Mobil Oil Corporation (an Exxon predecessor) and the API, drafted a primer on the science of climate change for GCC members. The primer concluded that the GCC’s contrarian theories “do not offer convincing arguments against the conventional model of greenhouse gas emission-induced climate change.”<sup>64</sup> Faced with this inconvenient conclusion, at its next meeting in January 1996 the

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<sup>64</sup> Global Climate Coalition, Science and Technology Advisory Committee, Primer on Climate Change Science (Jan. 18, 1996), at 16, *available at*

GCC-STAC decided simply to drop this seven-page section of the report. For years afterward, the GCC and its members continued to tout their contrarian theories about climate change, even though the GCC had admitted internally these arguments were invalid.

81. In February 1996, an internal GCC presentation stated that a doubling of carbon dioxide levels over pre-industrial concentrations would occur by 2100 and cause “an average rate of warming [that] would probably be greater than any seen in the past 10,000 years.” The presentation noted “potentially irreversible” impacts that could include “significant loss of life.”<sup>65</sup>

82. Certain Defendants also funded another front group in the 1990s, the Global Climate Science Communications Team (“GCSCT”). GCSCT members included Exxon, Chevron, and the API. A 1998 GCSCT task force memo outlined an explicit strategy to invest millions of dollars to manufacture uncertainty on the issue of climate change, directly emulating a similar disinformation campaign by the tobacco industry. The memo stated: “*Victory Will Be Achieved When,*” among other things, “*Average citizens ‘understand’ (recognize) uncertainties in climate science,*” public “*recognition of uncertainty becomes part of the ‘conventional wisdom.’*”<sup>66</sup> and the “*Media ‘understands’ (recognizes) uncertainties in climate science.*”<sup>66</sup> The plan stated that progress would be measured by the percentage of news articles that raise questions about climate change.

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[https://www.ucsusa.org/sites/default/files/attach/2015/07/Climate-Deception-Dossier-7\\_GCC-Climate-Primer.pdf](https://www.ucsusa.org/sites/default/files/attach/2015/07/Climate-Deception-Dossier-7_GCC-Climate-Primer.pdf).

<sup>65</sup> John Kinsman, Edison Electric Institute, Global Climate Change Science – Overview of Recent Developments (Feb. 13, 1996).

<sup>66</sup> Global Climate Science Communications: Action Plan (Apr. 3, 1998), *available at* <https://assets.documentcloud.org/documents/784572/api-global-climate-science-communications-plan.pdf>.

83. Defendant Exxon played a lead role in the campaign of deception and denial. Exxon paid researchers and front groups to create uncertainties about basic climate change science and used denialist groups to attack well-respected scientists. These were calculated business decisions by Exxon to undermine climate change science and bolster production of fossil fuels. Between 1998 and 2014, Exxon paid millions of dollars to organizations to promote disinformation on climate change. During the early- to mid-1990s, Exxon directed some of this funding to Dr. Fred Seitz, Dr. Fred Singer, and/or Seitz and Singer's Science and Environmental Policy Project ("SEPP") in order to launch repeated attacks on mainstream climate science and IPCC conclusions, even as Exxon scientists participated in the IPCC process. Dr. Seitz and Dr. Singer were not climate scientists. Dr. Seitz, Dr. Singer, and SEPP had previously been paid by the tobacco industry to create doubt in the public mind about the hazards of smoking.

84. In 2000, Exxon took out an advertisement, one among a series of advertisements, on the Op-Ed page of the *New York Times* entitled "Unsettled Science." The advertisement claimed that "scientists remain unable to confirm" the proposition that "humans are causing global warming."<sup>67</sup> This was six years after the IPCC had confirmed the causal link between planetary warming and anthropogenic greenhouse gas emissions and eighteen years after Exxon itself had admitted in a 1982 internal memoranda to corporate headquarters that there was "a clear scientific consensus" that greenhouse gas emissions would cause temperatures to rise.

85. Exxon also used denialist groups to attack well-respected scientists. In response to the IPCC's historic conclusion in 1995 that humans were causing global warming, Exxon funded a group that launched a vicious smear attack on Dr. Benjamin Santer, the lead IPCC

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<sup>67</sup> ExxonMobil, *Unsettled Science*, available at <https://assets.documentcloud.org/documents/705605/xom-nyt-2000-3-23-unsettledscience.pdf>.

scientist in charge of this finding. Dr. Santer was a MacArthur Fellow working in California at the Lawrence Livermore National Laboratory. An Exxon-funded scientist, Dr. Fred Seitz, who formerly had worked for R.J. Reynolds and founded organizations to deny tobacco science, published a *Wall Street Journal* op-ed that falsely claimed that Dr. Santer had violated IPCC protocol in changing a draft version of the report—a claim subsequently refuted by the IPCC chairman.<sup>68</sup> Nonetheless, Dr. Seitz and another scientist funded by Exxon, Dr. Fred Singer (who also had been a tobacco denier, infamous for attacking EPA’s draft secondhand smoke rule as “junk science”), launched a dizzying array of attacks on Dr. Santer that to this day remain alive and well on the web. In short, Exxon funded a smear campaign that misleadingly convinced the public that the IPCC’s historic causal conclusion was the subject of legitimate scientific controversy. It did so even though Exxon participated in the IPCC process through its scientists—a point that Exxon recently highlighted as evidence that it supposedly has always been in the scientific mainstream.

86. In the early 2000s, Exxon again attacked a respected scientist, Dr. Michael Mann. Dr. Mann had published a paper in peer-reviewed literature of what has come to be known as the “hockey stick” graph, which shows modern temperature sharply diverting from the temperatures of the last 1,000 years, and which was relied on by the IPCC in its 2001 report for its strengthened finding that humans were causing global warming, a report in which Exxon scientists participated. In response to the IPCC’s causal finding, Exxon sponsored its own bogus scientific research by paying \$120,000 over the course of two years (2003–2004) to the Fraser Institute, a Canadian organization that specializes in climate denialism. Senior Fraser Institute

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<sup>68</sup> See Susan K. Avery et al., Special Insert: An Open Letter to Ben Santer (July 25, 1996), available at [http://www.realclimate.org/docs/BAMS\\_Open\\_Letter.pdf](http://www.realclimate.org/docs/BAMS_Open_Letter.pdf).

Fellow Dr. Ross McKittrick and a co-author then published a supposed refutation of Dr. Mann’s “hockey stick” graph.<sup>69</sup> Dr. McKittrick was an economist, not a scientist, and his co-author was a mining company executive. In 2003, the McIntyre and McKittrick paper was rushed into print, without peer review and, in a departure from the standard scientific practice, without offering Dr. Mann and his co-authors an opportunity to respond prior to publication. The McIntyre and McKittrick paper was subsequently debunked,<sup>70</sup> but the smear of Dr. Mann’s work remains available on the web today and continues to be cited by climate deniers.<sup>71</sup> Exxon’s promotion by deception thus lives on.

87. One of Defendants’ most frequently used denialists has been an aerospace engineer named Dr. Wei Hock Soon. Between 2001 and 2012, various fossil fuel interests, including Exxon and the API, paid Dr. Soon over \$1.2 million. Dr. Soon was the lead author of a 2003 article that argued that the climate had not changed significantly. The article was widely promoted by other denial groups funded by Exxon, including via “Tech Central Station,” a website supported by Exxon. Soon published other bogus “research” in 2009, attributing climate change to solar activity, for which Exxon paid him \$76,106. This 2009 grant was made several years after Exxon had publicly committed not to fund climate change deniers.

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<sup>69</sup> Stephen McIntyre & Ross McKittrick, *Corrections to the Mann et al. (1998) Proxy Database and Northern Hemispheric Average Temperature Series*, 14 ENERGY & ENVIRONMENT 751 (2003), available at

[http://stephenschneider.stanford.edu/Publications/PDF\\_Papers/mcintyre\\_02.pdf](http://stephenschneider.stanford.edu/Publications/PDF_Papers/mcintyre_02.pdf).

<sup>70</sup> See, e.g., *False Claims by McIntyre and McKittrick Regarding the Mann et al. (1998) Reconstruction*, REALCLIMATE (Dec. 4, 2004),

<http://www.realclimate.org/index.php/archives/2004/12/false-claims-by-mcintyre-and-mckittrick-regarding-the-mann-et-al-1998reconstruction/>.

<sup>71</sup> *Hockey Stick, 1998-2005, R.I.P.*, WORLD CLIMATE REPORT (Mar. 3, 2005),

<http://www.worldclimaterreport.com/index.php/2005/03/03/hockey-stick-1998-2005-rip/>;

Anthony Watts, *McIntyre and McKittrick to Receive Award*, WATTS UP WITH THAT? (June 14, 2010),

<https://wattsupwiththat.com/2010/06/14/mcintyre-and-mckittrick-to-receive-award/>.



88. As noted above, in 1982 Exxon's scientific staff had relied on climate models to conclude that there was a "clear scientific consensus" on projected future climate change and starting shortly thereafter Exxon relied upon these projections to protect its own business assets.<sup>72</sup> But that did not stop Exxon from engaging in a long effort to discredit the climate models as unreliable. For example, in 1999, former CEO Lee Raymond stated at an annual Exxon meeting that future climate "projections are based on completely unproven climate models, or, more often, on sheer speculation."<sup>73</sup> In a 2005 corporate citizenship report, even as Exxon admitted "the risk that greenhouse gas emissions may have serious impacts justifies taking action" (action it still has not taken), it still attacked the climate models in an effort to discredit the basic causal connection between its products and climate change: "gaps in the scientific basis for theoretical climate models and the interplay of significant natural variability make it very difficult to determine objectively the extent to which recent climate changes might be the result of human actions."<sup>74</sup> This was several years after the IPCC's 2001 report concluding that human-induced warming had been detected, a report in which Exxon scientists participated. Exxon has recently kept up the attacks on the models: in May 2015, at Exxon's annual shareholder meeting, then-CEO Rex Tillerson misleadingly stated: "What if everything we do it turns out our models were really lousy and we achieved all of our objectives and it turned out the planet behaved differently because the models just weren't good enough to predict it?"

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<sup>72</sup> See also Geoffrey Supran & Naomi Oreskes, *Assessing ExxonMobil's Climate Change Communications (1977-2014)*, 12 ENVTL. RES. LETT. (2017), available at <http://iopscience.iop.org/article/10.1088/1748-9326/aa815f/pdf>.

<sup>73</sup> Sara Jerving et al., *What Exxon Knew About the Earth's Melting Arctic*, L.A. TIMES, Oct. 9, 2015, available at <http://graphics.latimes.com/exxon-arctic/>.

<sup>74</sup> EXXONMOBIL CORPORATION, 2005 CORPORATE CITIZENSHIP REPORT 23.

89. Until recently, the API's website referred to climate change as "possible man-made warming" and claimed that the human contribution is "uncertain."<sup>75</sup> The API removed this statement from its website in 2016 when journalistic investigations called attention to the API's misleading statements on climate change and its participation in the climate change Task Force during the late 1970s and early 1980s.

90. Similarly, until recently Exxon's website continued to emphasize the "uncertainty" of climate change science and impacts: "current scientific understanding provides limited guidance on the likelihood, magnitude, or time frame" of events like temperature extremes and sea level rise.<sup>76</sup> Exxon's insistence on crystal-ball certainty was clear misdirection, since Exxon knew at this time that the fundamentals of climate science were well settled and that climate change presented a clear and present danger.

**B. Defendants directly promoted fossil fuels.**

91. Despite their knowledge that fossil fuels cause severe climate change injuries, Defendants continue to promote massive fossil fuel use. Defendants promote fossil fuels through advertisements that laud fossil fuels as "responsible" and "respectful" to the environment, identify fossil fuels as the only way to sustain modern standards of living, and promote sales of fossil fuels without qualification. The API also promotes the benefits of fossil fuel products on behalf of Defendants and its other members. Defendants' message to consumers is that fossil fuels may continue to be burned in massive quantities without risking significant harm.

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<sup>75</sup> Formerly found at [http://www.api.org/policy-and-issues/policy-items/environment/climate\\_change](http://www.api.org/policy-and-issues/policy-items/environment/climate_change).

<sup>76</sup> Formerly found at <http://corporate.exxonmobil.com/en/current-issues/climatepolicy/meeting-global-needs/managing-climate-change-business-risks>.

92. Defendants continue to bombard the public and consumers with these advertisements, which build on the decades of misleading statements on climate change described above. Defendants' advertisements have included the following:

a. Exxon's "Lights Across America" website advertisement states that natural gas is "helping dramatically reduce America's emissions,"<sup>77</sup> even though natural gas is a fossil fuel causing widespread planetary warming and harm, and the use of natural gas competes with wind and solar, which have no greenhouse gas emissions.

b. A Shell website promotion states: "We are helping to meet the world's growing energy demand while limiting CO2 emissions, by delivering more cleaner-burning natural gas."<sup>78</sup>

c. BP touts natural gas on its website as "a vital lower carbon energy source" and as playing a "crucial role" in a transition to a lower carbon future.<sup>79</sup>

d. Chevron's website tells the public that "we produce safe, reliable energy products for people around the world."<sup>80</sup> Chevron also says in its advertising that "[o]il and natural gas will continue to fulfill a significant portion of global energy demand for decades to come – even in a carbon-constrained scenario."<sup>81</sup> A prior Chevron

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<sup>77</sup> *ExxonMobil, Lights Across America* (2015) (at 0:46), available at [https://www.youtube.com/watch?v=tMu1CBjXfq4&list=PLirXIHj7zayYGaExiTp\\_B4t6gqTtkGf9A&index=6\\_](https://www.youtube.com/watch?v=tMu1CBjXfq4&list=PLirXIHj7zayYGaExiTp_B4t6gqTtkGf9A&index=6_).

<sup>78</sup> *Transforming Natural Gas*, SHELL UNITED STATES, <http://www.shell.us/energy-and-innovation/transforming-natural-gas.html> (last visited Jan. 1, 2018).

<sup>79</sup> BP SUSTAINABILITY REPORT 2016, available at <https://www.bp.com/content/dam/bp/en/corporate/pdf/sustainability-report/group-reports/bp-sustainability-report-2016.pdf>; <http://www.bp.com/energytransition/shifting-towards-gas.html>.

<sup>80</sup> *Products and Services*, CHEVRON, <https://www.chevron.com/operations/products-services> (last visited Jan. 1, 2018).

<sup>81</sup> *Managing Climate Change Risks*, CHEVRON, <https://www.chevron.com/corporate-responsibility/climate-change/managing-climate-risk>.

advertisement that is still available on the web, and that was never disavowed by Chevron promotes Chevron fossil fuels on a massive scale by stating that “our lives demand oil.”<sup>82</sup>

e. ConocoPhillips promotes its fossil fuel products by stating that it “responsibly suppl[ies] the energy that powers modern life.”<sup>83</sup>

93. Defendants BP and Exxon have also used long-term energy forecasts and similar reports as advocacy pieces to promote their products under the guise of expert, objective “analysis.” These forecasts have repeatedly sought to justify heavy reliance on fossil fuels by overstating the cost of renewable energy.

94. Defendants’ energy forecasts are aimed in substantial part at consumers and are promoted to the public through their respective websites and other direct media. Exxon continues to promote its annual “Outlook for Energy” reports in videos currently available on the internet. But Exxon’s energy “analyses” are self-serving means of promoting fossil fuels and undercutting renewable energy and clean technologies. For example, Exxon has misleadingly claimed in a recent forecast that natural gas is a cheaper way to reduce carbon dioxide emissions than wind or solar power. Similarly, BP has claimed that solar and wind power will be more expensive in 2050 than natural gas or coal—even though wind and solar are *already* cheaper than natural gas or coal in some circumstances and their prices are dropping precipitously. Exxon and BP also have understated in recent “forecasts” the expected market share of electric vehicles, even though electric vehicle technology has taken off, prices have dropped, and GM announced (in 2015) that it was investing billions in electric cars because the “future is electric.”

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<sup>82</sup> *Chevron, Human Energy* (2009), available at <https://www.youtube.com/watch?v=-KyjTGMVTkA>.

<sup>83</sup> *Formerly found at* <http://www.conocophillips.com/who-we-are/our-company/spirit-values/responsibility/Pages/the-changing-energy-landscape.aspx>.

95. Defendants' energy forecast reports also promote their fossil fuel products by warning consumers of supposed downsides to reducing fossil fuel use and carbon dioxide emissions. For example, Exxon's most recent report claims that the costs of carbon dioxide reductions are "ultimately borne by consumers and taxpayers."<sup>84</sup>

96. These reports by BP and Exxon, and a similar one by Shell, predict massive increases in fossil fuel use over roughly the next 15 years. These reports are part of a larger strategy of "mak[ing] the case for the necessary role of fossil fuels," as BP's chief executive stated in a moment of candor in 2015.<sup>85</sup>

97. Yet this "case for the necessary role" is a recipe for disaster—as one of Defendants has now finally admitted. On November 28, 2017, Shell finally acknowledged the importance of "keeping the rise in global temperatures below 2 degrees C," and also acknowledged that this "means that, *over time*, we as society must stop adding to the stock of greenhouse gases in the atmosphere," *i.e.*, a phase down of fossil fuels to net zero emissions. But, critically, Shell did not say when this should occur. While Shell also announced on the same day that it would be reducing the carbon footprint of its energy products by "around" half by 2050, Shell in fact was merely agreeing to reduce the carbon "intensity" of its mix of energy products (*i.e.*, the carbon emissions per unit of energy). Shell has said nothing to alter the fact that its total fossil fuel production and sales, and hence the total GHG pollution from its products, may well, and likely will, go up in absolute terms. Shell's announcement is too little and too late to avert the climate change impacts that already are occurring, and that will

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<sup>84</sup> EXXONMOBIL, 2017 OUTLOOK FOR ENERGY: A VIEW TO 2040 31 (2017).

<sup>85</sup> Bob Dudley, BP, 2015 Annual General Meeting: Group Chief Executive (Apr. 16, 2015), *available at* <http://www.bp.com/en/global/corporate/media/speeches/2015-annual-general-meeting-group-chief-executive.html>.

inevitably grow worse over the coming decades based in substantial part upon Shell and other Defendants' past and continuing conduct and future business plans.

98. On December 11, 2017, Exxon filed a notice with the U.S. Securities & Exchange Commission that it "has decided to further enhance the Company's disclosures" consistent with a 2017 shareholder proposal requesting that Exxon more fully disclose the impacts of climate change policies on its business, and stated that it "will seek to issue" disclosures on "energy demand sensitivities, implications of two degree Celsius scenarios, and positioning for a lower-carbon future" in the "near future."<sup>86</sup> Shareholders have been calling on Exxon to make further detailed disclosures on how climate change will impact its business for years. Exxon's brief announcement—which says nothing about reducing oil and gas production—will do nothing to avert climate change impacts that already are occurring, and that will inevitably grow more severe based upon Exxon and other Defendants' past and continuing conduct and future business plans.

99. The bottom line is that Defendants continue to double down on the production of massive amounts of oil and natural gas, and encourage consumers to use unlimited amounts of fossil fuel products, despite having known for decades that this conduct was substantially certain to cause grave harm, including by putting coastal cities like New York City on the front lines of climate disaster.

**IX. THE CITY IS EXPENDING SUBSTANTIAL FUNDS, AND WILL CONTINUE TO DO SO, TO PROTECT ITSELF AGAINST CLIMATE CHANGE**

100. Given New York City's particular vulnerability to climate change, the City has been forced to take proactive steps to protect itself and its residents from its dangers and impacts.

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<sup>86</sup> Exxon, Regulation FD Disclosure to the United States Securities and Exchange Commission, *available at* <https://www.sec.gov/Archives/edgar/data/34088/000003408817000057/r8k121117.htm>.

101. The City's first formal planning endeavor occurred with the issuance in 2007 of "PlaNYC: A Greener, Greater New York," a pioneering effort to accommodate a growing population, enhance the quality of life for all New Yorkers, and plan for climate change. PlaNYC included a recommendation that the City convene the NPCC, which the City did. The analysis and commitments contained in PlaNYC are now embodied in "OneNYC: The Plan For A Strong And Just City," which incorporates equity considerations into the foundation set forth in PlaNYC to consider how to make the City more resilient and sustainable.

102. The City made a further unprecedented commitment to climate adaption and resiliency in the aftermath of Hurricane Sandy, when it launched a \$20 billion-plus multilayered investment program in climate resiliency across all five boroughs.<sup>87</sup> These first steps of the City's resiliency effort will take many years to complete, and include constructing levees and seawalls, elevating City facilities and streets, waterproofing and hardening City infrastructure, and modifying or reconstructing sewers and stormwater infrastructure to handle additional stormwater and adapt to interference with outfalls from sea level rise.

103. For example, the East Side Coastal Resiliency Project, currently budgeted at \$760 million, is designed to protect Manhattan's lower east side neighborhoods from flood risk due to coastal storms and sea level rise by constructing a 2.4 mile-long barrier along the City's East River. The Two Bridges Project, currently budgeted at \$203 million, will extend that protection

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<sup>87</sup> *Mayor Announces New Resiliency Guidelines to Prepare City's Infrastructure and Buildings for Effects of Climate Change* (Apr. 28, 2017), <http://www1.nyc.gov/office-of-the-mayor/news/271-17/mayor-new-resiliency-guidelines-prepare-city-s-infrastructure-buildings-for>.

south to the Brooklyn Bridge. A barrier to be constructed along the southeast shore of Staten Island will protect some of the communities most devastated by Hurricane Sandy.<sup>88</sup>

104. The City is undertaking Cool Neighborhoods NYC, a comprehensive program to keep City communities safe in extreme heat, at a cost of over \$100 million to the City; multiple resiliency measures implemented by Health + Hospitals, the City's public health care network, with over \$100 million of City funds; and the Raised Shorelines Program, which will elevate shorelines throughout the City to protect low-lying areas, at a City budget of \$100 million to fund 9 initial sites, among 91 identified. To protect the City's solid waste-management program from sea level rise and storm surge, the City hardened two marine transfer stations and raised platforms in one of them. Many such City projects have not yet been fully funded.

105. In addition to these already-identified and commenced resiliency efforts, the City must promptly take a wide array of more robust measures to make the City more resilient and protect the public and City property from the dire threat of climate change. Indeed, the coastal flood protection projects initiated after Sandy largely protect areas of the City that were flooded during that storm, but do not protect other low-lying areas of the City that are vulnerable to flooding from storms that can come from other directions, such as northwest Queens and the Bronx. The City must build sea walls, levees, dunes, and other coastal armaments and must elevate, solidify, and adapt a vast array of City-owned structures, properties, and parks along its whole coastline, not only the stretches flooded by Sandy. The City must enlarge existing storm and wastewater storage facilities and install additional new facilities, as well as associated infrastructure and pumping facilities, to prevent flooding in low-lying areas that are vulnerable to rising seas or could potentially be overwhelmed by increasingly severe downpours. Making the

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<sup>88</sup> CITY OF NEW YORK, *supra* note 25, at 283-87.



City's storm and wastewater infrastructure more robust will, in certain locations, require building high-level storm sewers and modifying other related infrastructure.

106. The City owns and maintains dozens of parks located partially or entirely on the shoreline (including the Hudson River and the East River estuaries). These include Rockaway Beach and Boardwalk, with 7 miles of City-owned beach and 5.5 miles of boardwalk; Coney Island Beach and Boardwalk, consisting of 399 acres with almost 3 miles of coastline; Franklin D. Roosevelt Boardwalk and Beach, with 2.5 miles of coastline; Pelham Bay Park; Ferry Point Park's Wolfe's Pond Park; Flushing Meadows-Corona Park; the Battery; and Riverside Park. These are just some of the City-owned properties threatened by rising sea levels and higher storm surges, and many are being hardened or will need to be hardened against these threats in the near future.

107. Addressing climate change hazards means that the City has to change the way it designs and builds City capital projects, and requires the City to fund modifications and additional protections. The City has developed preliminary Climate Resiliency Design Guidelines ("Guidelines") to provide an approach for using forward-looking climate data in the design of City capital projects. The Guidelines will help ensure that the City's investments in buildings and infrastructure are more resilient to climate change hazards, including rising sea levels and changes in extreme precipitation and heat.<sup>89</sup> These Guidelines are needed to protect the City from extreme weather associated with climate change and threats such as sea level rise. Although preliminary, the Guidelines are already influencing design decisions. For example, the

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<sup>89</sup> CITY OF NEW YORK, MAYOR'S OFFICE OF RECOVERY & RESILIENCY, PRELIMINARY CLIMATE RESILIENCY DESIGN GUIDELINES (2017), *available at* [http://www1.nyc.gov/assets/orr/images/content/header/ORR\\_ClimateResiliencyDesignGuidelines\\_PRELIMINARY\\_4\\_21\\_2017.pdf](http://www1.nyc.gov/assets/orr/images/content/header/ORR_ClimateResiliencyDesignGuidelines_PRELIMINARY_4_21_2017.pdf).

Department of Environmental Protection, which builds and operates the City's water and wastewater infrastructure, is now using the Guidelines to inform the design of their infrastructure to be resilient in a changing climate.

108. Because of the severe public health impacts of extreme weather that will worsen with climate change, the City has launched a number of public health preparedness programs to reduce the public health impacts to its citizens from heat waves, sea level rise, and coastal storms. The City is spending millions of dollars on programs to help vulnerable City residents stay safe during dangerous weather emergencies that will be exacerbated by climate change, and expects these programs will need to grow exponentially in the future because they are critical to saving lives during heat waves and other climate change-related hazards.

109. The City has also increased its efforts to plan temporary protections against climate change-related risks. In 2016, the City's Department of Emergency Management and the Mayor's Office of Recovery and Resiliency launched the Interim Flood Protection Measures program, a multi-million dollar program that provides for the temporary installation and deployment of protective measures, such as HESCO barriers and water-filled tubes, in low-lying areas and adjacent to vulnerable City assets to reduce overland flooding from coastal flood events. These programs will need to expand, and will become more costly, as the floodplains continue to grow as a result of climate change.

110. The costs of all these measures will only increase as climate change worsens. Most these projects are long-term design and construction projects—and they must be built to last for several decades, often as long as fifty years or more. The design and construction of these projects must begin now in order to complete them in time to protect the safety, health, and welfare of City residents and municipal property and infrastructure from the increasing dangers

of climate change, given the pace of global warming. The City is seeking the additional costs incurred in taking actions that, without climate change, would not have been necessary, could have been deferred or postponed, or would have otherwise been less costly. The cost of needed resiliency projects runs to many billions of dollars.

111. As noted, Defendants themselves have been taking climate change impacts into account when planning for and building their own operations and infrastructure, the same thing that the City now must do. Exxon has stated that since its operations may be disrupted by “severe weather events” and “natural disasters,” to protect business assets such as its offshore production facilities, coastal refining operations, and petrochemical plants in vulnerable areas, its designs should account for the “engineering uncertainties that climate change and other events may potentially introduce.”<sup>90</sup> Chevron also takes into account potential risks to its operations and assets, including “storm severity and frequency” and “sea level rise” to “plan for their resiliency.”<sup>91</sup> Likewise, ConocoPhillips has warned that it could incur increased expenses for its assets and operations if there are “significant changes in the Earth’s climate, such as more severe or frequent weather conditions.”<sup>92</sup> Defendants thus recognize that protecting infrastructure and operations from climate change is necessary and entails additional planning and costs than would otherwise be required. In the same way, the City seeks to be able to more fully protect itself from climate change impacts to which Defendants have substantially contributed.

#### **X. DEFENDANTS’ CONDUCT IS ONGOING, AND IS CAUSING CONTINUOUS AND RECURRING INJURIES TO THE CITY**

112. Defendants’ conduct is causing a continuous encroachment upon and interference with the City’s property. For example, areas of the City that were once above the mean high tide

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<sup>90</sup> Exxon Mobil Corporation, Form 10-K for the Fiscal Year Ended Dec. 31, 2016, at 4.

<sup>91</sup> Chevron Corporation, Form 10-K for the Fiscal Year Ended Dec. 31, 2016, at 20.

<sup>92</sup> ConocoPhillips, Form 10-K for the Fiscal Year Ended Dec. 31, 2016, at 25.

line now experience regular tidal inundation. This sea level rise will inevitably grow worse, regularly inundating additional City-owned property, and eventually portions of coastal areas owned by the City may be continuously submerged.

113. Defendants' conduct is also causing recurring harms to the City. These harms include encroachments upon and interferences with the City's property from higher storm surges and more intense storms, as well as injuries to public health resulting from more frequent and more intense heat waves and flooding. These recurring harms will also grow worse and more frequent in the future.

114. Defendants' conduct that has caused and is causing these harms to City property and public health has also been continuous and ongoing. As described above, Defendants continue to produce, market, distribute, and sell fossil fuels in massive quantities; to promote fossil fuel consumption in these massive quantities; and to downplay the threat posed by climate change. This ongoing conduct will cause increasingly severe injuries to the City, including new and more significant continuous encroachments upon and interferences with City property, and increasingly severe threats to public health.

#### **AS A FIRST CAUSE OF ACTION – PUBLIC NUISANCE**

115. The City realleges and reaffirms each and every allegation set forth in all the preceding paragraphs as if fully stated herein.

116. Defendants' production, marketing, and sale of massive quantities of fossil fuels, and their promotion of pervasive use of these fossil fuels, have caused, created, assisted in the creation of, maintained, and/or contributed to the current and threatened climate change impacts on the City described above. These impacts are indivisible injuries, and include but are not limited to harms to the safety, health, and welfare of City residents and to the City's property and infrastructure from sea level rise, increased flooding and storm surge, higher temperatures,

greater heat waves, and increases in the frequency and intensity of precipitation. Defendants' conduct continues to cause, create, assist in the creation of, maintain, and/or contribute to these impacts.

117. The City has suffered injuries beyond those of the community at-large. For example, the City has the primary responsibility to elevate, harden, and/or adapt existing municipally-owned infrastructure (much of it on City-owned property) damaged or threatened by climate change, including roads, pumping stations, beaches, parks, sewers, aqueducts, marine transfer stations, and wastewater treatment facilities. The City also has the primary responsibility to build new infrastructure to protect its residents from climate change. The City also protects public hospitals and medical facilities and funds programs to protect New Yorkers from the health consequences of climate change. Each Defendant has at all relevant times been aware, and continues to be aware, that the inevitable emissions of greenhouse gases from the fossil fuels it produces combine with the greenhouse gas emissions from fossil fuels produced by the other Defendants, among others, to result in dangerous levels of global warming with grave harms, including the harms to coastal cities like New York. Defendants have promoted the use of fossil fuels at unsafe levels with knowledge of the hazard that such use would create. Defendants' conduct has been the actual and proximate cause of harm to New York City. Defendants' conduct, individually and collectively, has been a substantial factor in causing climate change in New York City, which has caused (and will continue to cause) sea level rise, increased flooding, more frequent and extreme weather events, temperature increases, and the other impacts described above. These injuries are the foreseeable result of Defendants' conduct and Defendants were substantially certain at the relevant times that they would occur as a result of their conduct.

118. Defendants continue to produce, market, and sell massive quantities of fossil fuels, and, as they know, the use of their fossil fuel products continues to emit greenhouse gases and exacerbate global warming and the City's injuries. Defendants' actions are causing recurring, intermittent, continuous, and/or ongoing harm to the City, including flooding and erosion of City property.

119. Defendants' conduct constitutes a substantial and unreasonable interference with and obstruction of public rights and property, including the public rights to health, safety, and welfare of a considerable number of people who reside in and visit New York City. The safety and property of these people and the safety of municipal property have been harmed, are being harmed, and will be harmed in the future by sea level rise, increased storm surge flooding, extreme heat, and other climate change impacts.

120. Defendants are jointly and severally liable to the City for committing a public nuisance.

121. The City is entitled to relief as set forth below.

**AS A SECOND CAUSE OF ACTION – PRIVATE NUISANCE**

122. The City realleges and reaffirms each and every allegation set forth in all the preceding paragraphs as if fully stated herein.

123. Defendants' production, marketing, and sale of massive quantities of fossil fuels, and their promotion of pervasive use of these fossil fuels, have caused, created, assisted in the creation of, maintained, and/or contributed to the current and threatened climate change impacts on the City described above. These impacts are indivisible injuries, and include harms to City property from sea level rise, increased flooding, higher temperatures, increased costs to protect the City's water supply, and increases in the frequency and intensity of precipitation.

Defendants' conduct continues to cause, create, assist in the creation of, maintain, and/or contribute to these impacts.

124. Each Defendant has at all relevant times been aware, and continues to be aware, that the inevitable emissions of greenhouse gases from the fossil fuels it produces combines with the greenhouse gas emissions from fossil fuels produced by the other Defendants, among others, to result in dangerous levels of global warming with grave harms for coastal cities like New York City. Defendants have promoted the use of fossil fuels at unsafe levels even though they should have known, and in fact have known for many years, of the hazard that such use would create.

125. Defendants' conduct has been the actual and proximate cause of harm to New York City. Defendants' conduct, individually and collectively, has been a substantial factor in causing climate change in New York City, which has caused (and will continue to cause) sea level rise, increased flooding, temperature increases, and the other impacts described above. These injuries are the foreseeable result of Defendants' conduct and Defendants were substantially certain at the relevant times that they would occur as a result of their conduct.

126. Defendants continue to produce, market, and sell massive quantities of fossil fuels, and, as they know, the use of their fossil fuel products continues to emit greenhouse gases and exacerbate global warming and the City's injuries. Defendants' actions are causing recurring, intermittent, continuous, and/or ongoing harm to the City, including flooding and erosion of City property.

127. Defendants' conduct constitutes a substantial and unreasonable interference with the City's rights to the use and enjoyment of its property. City-owned property has been harmed,

is being harmed, and will continue to be harmed in the future by sea level rise, increased storm surge flooding, extreme heat, and other climate change impacts.

128. Defendants are jointly and severally liable to the City for committing a private nuisance.

129. The City is entitled to relief as set forth below.

**AS A THIRD CAUSE OF ACTION – TRESPASS**

130. The City realleges and reaffirms each and every allegation set forth in all the preceding paragraphs as if fully stated herein.

131. Defendants have intentionally produced, marketed, and sold massive quantities of fossil fuels, and promoted their pervasive use, despite their knowledge that such fuels would lead to climate change-related injuries.

132. This conduct was substantially certain to result in the invasion of property owned by the City, without permission or right of entry, by way of increased heat, sea level rise, storm surge flooding, and flooding from increased intensity and frequency of precipitation. These invasions are now occurring, and will continue to occur onto additional City-owned property in the future.

133. Defendants' conduct, individually and collectively, was a substantial factor in causing global warming impacts, including accelerated sea level rise, increased flooding, increased storm inundation, and increased intensity and frequency of precipitation, and was the actual and proximate cause of the invasion of the City's property.

134. Defendants continue to produce, market, and sell massive quantities of fossil fuels, and, as they know, the use of their fossil fuel products continues to emit greenhouse gases and exacerbate global warming and the City's injuries. Defendants' actions are causing



recurring, intermittent, continuous, and/or ongoing harm to the City, including flooding and erosion of City property.

135. Defendants' conduct constitutes a continuing, unauthorized intrusion and a continuing trespass onto the City's property. Defendants' continued trespass has caused, and will continue to cause, substantial damage to the City.

136. The City is entitled to relief as set forth below.<sup>93</sup>

**JURY TRIAL DEMANDED**

137. Plaintiff demands a trial by jury for all issues triable by jury.

**RELIEF REQUESTED**

**WHEREFORE**, the City respectfully requests a judgment against all Defendants awarding the City:

1. Compensatory damages in an amount according to proof, for the costs already incurred by the City to protect City infrastructure and property, and to protect the public health, safety, and property of its residents from the impacts of climate change;
2. Compensatory damages in an amount according to proof, of the costs of actions the City is currently taking and needs to take to protect City infrastructure and property, and to protect the public health, safety, and property of its residents from the impacts of climate change;
3. An equitable order ascertaining the damages and granting an injunction to abate the public nuisance and trespass that would not be effective unless Defendants fail to pay the court-determined damages for the past and permanent injuries inflicted;
4. Costs and disbursements of this action as permitted by law;
5. Attorneys' fees as permitted by law;

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<sup>93</sup> The City does not seek equitable relief or damages with respect to any federal land under any of its causes of action.

6. Pre- and post-judgment interest as permitted by law; and
7. Such other relief as this Court deems just and proper.

Dated: January 9, 2018  
New York, New York

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