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URBAN FLOODING: LEGAL TOOLS TO ADDRESS A GROWING CRISIS

MICHAEL B. GERRARD^(*)

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While sea level rise has long received a great deal of attention, another impact of climate change is now getting greater notice—increases in extreme precipitation. As the atmosphere warms, it can hold more moisture; for every increase of one degree

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Celsius, seven percent more water vapor is carried in the air.¹ When that moisture is quickly released as intense rainstorms, stormwater systems can be overwhelmed, and cities can suffer devastating floods.²

The frequency and intensity of heavy precipitation events have increased since the 1950s over most of the world's land areas.³ One 2023 study—generally consistent with several prior works—projected a 51.6% increase in extreme precipitation in the northeastern United States by the end of the 21st Century.⁴ What have historically been called 100-year storms (indicating that a storm of that magnitude has a one-in-one-hundred chance of occurring in a given year) are now occurring as often as every five or ten years.⁵ In one five-week period in 2022, places in several different parts of the U.S. (St. Louis, eastern Kentucky, eastern Illinois, Death Valley, California, and Dallas-Fort Worth) were all struck by what were called 1,000-year rain events—storms with a one-in-one-thousand chance of occurring in a given year.⁶ On top of extreme rainfall, storm surge worsened by sea level rise can devastate coastal cities, but even inland locations that are near—or

1. Dim Coumou & Stefan Rahmstorf, *A Decade of Weather Extremes*, *Nature Climate Change*, SPRINGER NATURE (Mar. 25, 2012), https://www.pik-potsdam.de/~stefan/Publications/Nature/Coumou_Rahmstorf_NCC2012.pdf; see also *Wettest Seasons in U.S. Regions*, CLIMATE CENT. (Oct. 18, 2023), <https://www.climatecentral.org/climate-matters/wettest-seasons-in-us-regions-2023>; Andreas F. Prein et al., *The Future Intensification of Hourly Precipitation Extremes*, 7 *NATURE CLIMATE CHANGE* 48 (2017); Jiabo Yin et al., *Large Increase in Global Storm Runoff Extremes Driven by Climate and Anthropogenic Changes*, 9 *NATURE COMMUN.* 4389 (2018).

2. Mathew Barlow, *How Climate Change Intensifies the Water Cycle, Fueling Extreme Rainfall and Flooding – the Northeast Deluge Was Just the Latest*, THE CONVERSATION (July 11, 2023), <https://theconversation.com/how-climate-change-intensifies-the-water-cycle-fueling-extreme-rainfall-and-flooding-the-northeast-deluge-was-just-the-latest-209476>.

3. INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2021: THE PHYSICAL SCIENCE BASIS. CONTRIBUTION OF WORKING GROUP I TO THE SIXTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (2021), p. 8, ¶A.3.2, <https://www.ipcc.ch/report/sixth-assessment-report-working-group-i/>.

4. Christopher J. Picard et al., *Twenty-First Century Increases in Total and Extreme Precipitation Across the Northeastern USA*, 176 *CLIMATE CHANGE* 72 (2023); see, e.g., U.S. *Precipitation is Becoming More Intense*, U.S. GLOB. CHANGE RSCH. PROGRAM, <https://www.globalchange.gov/indicators/heavy-precipitation#:~:text=Heavy%20precipitation%20is%20becoming%20more,of%20floods%20and%20flash%20floods>.

5. FIRST ST. FOUND., THE 8TH NATIONAL RISK ASSESSMENT: THE PRECIPITATION PROBLEM 4 (June 26, 2023), <https://report.firststreet.org/8th-National-Risk-Assessment-The-Precipitation-Problem.pdf>.

6. Matthew Cappucci, *Five 1,000-Year Rain Events Have Struck the U.S. in Five Weeks. Why?*, WASH. POST (Aug. 23, 2022), <https://www.washingtonpost.com/climate-environment/2022/08/23/flood-united-states-climate-explainer/>.

not so near⁷—rivers can see similar destruction.⁸ In addition to the disruption of property, many illnesses can result when stormwater causes the release of untreated sewage onto the surface of, and into, waterways.⁹ Ecological impacts, such as increased fish mortality caused by the polluting runoff, also occur.¹⁰

There is ample literature on flooding caused by sea level rise.¹¹ The focus of this article, however, is on flooding in cities caused primarily by rain combined with land-use patterns and inadequate stormwater drainage. Though, of course, the two often combine.

This article proceeds as follows. Part I discusses the nature of the growing crisis in urban flooding, how precipitation is estimated, and how expected flooding is (or is not) disclosed in maps and otherwise. Part II shows the roles of the different levels of government—federal, state, and local—in addressing urban flooding. Part III goes through the various physical methods of coping with urban flooding (grey infrastructure, infiltration, storage, defense, accommodation, and retreat), and some of the associated legal implications. Part IV concerns how the physical methods discussed in Part III can be financed. Part V concludes with thoughts on setting priorities.

7. Christopher Flavelle & Rick Rojas, *Vermont Floods Show Limits of America's Efforts to Adapt to Climate Change*, N.Y. TIMES (July 11, 2023), <https://www.nytimes.com/2023/07/11/climate/climate-change-floods-preparedness.html>.

8. This is distinct from the phenomenon of chronic, disruptive flooding, often called “nuisance flooding.” A 2020 study found that the frequency of coastal flooding at high tide without storms was more than twice that in the year 2000, and could be double or triple that by 2030. WILLIAM SWEET ET AL., 2019 STATE OF U.S. HIGH TIDE FLOODING WITH A 2020 OUTLOOK (2020), https://tidesandcurrents.noaa.gov/publications/Techrpt_092_2019_State_of_US_High_Tide_Flooding_with_a_2020_Outlook_30June2020.pdf; see also Philip R. Thompson et al., *Rapid Increases in Extreme Months in Projections of United States High Tide Flooding*, 11 NATURE CLIMATE CHANGE 584 (2021) (noting that the situation could worsen in mid-2030s due to combination of sea level rise and where the earth will be in the 18.6-year nodal cycle, concerning the alignment of the earth, the moon and the sun).

9. William Addison-Atkinson et al., *Modelling Urban Sewer Flooding and Quantitative Microbial Risk Assessment: A Critical Review*, 15(4) J. FLOOD RISK MGMT. (2022), <https://onlinelibrary.wiley.com/doi/full/10.1111/jfr3.12844>.

10. B.F. French et al., *Urban Roadway Runoff is Lethal to Juvenile Coho, Steelhead, and Chinook Salmonids, But Not Congeneric Sockeye*, 9 ENV'T SCI. TECH. LETTERS 733 (2022); Perry Wheeler, *What's Killing the Salmon in Our Urban Streams? A Mystery Is Now Solved*, EARTHJUSTICE (Aug. 1, 2023), <https://earthjustice.org/article/whats-killing-the-salmon-in-our-urban-streams-a-mystery-is-now-solved>.

11. See, e.g., JEFF GOODELL, *THE WATER WILL COME: RISING SEAS, SINKING CITIES, AND THE REMAKING OF THE CIVILIZED WORLD* (2017).

I. THE GROWING CRISIS

A. Events and Impacts

In the words of a 2018 academic report, *The Growing Threat of Urban Flooding: A National Challenge*:

In much of the United States, urban flooding is occurring and is a growing source of significant economic loss, social disruption, and housing inequality. Extensive suburban development that creates higher flood flows into urban areas, aging and frequently undersized infrastructure in older sections of communities, an inability to maintain existing drainage systems, increases in intense rainfall events, and uncoordinated watershed management all contribute to these increases in urban flooding.¹²

Over the last century, annual precipitation has increased across most of the eastern and central United States and decreased in parts of the Southwest.¹³ However, extreme rain events have increased for most sections of the country.¹⁴ This is due mostly to warming caused by the accumulation of greenhouse gas emissions.¹⁵ This affects inland areas as well as the coasts; flooding across the Midwest and South during 2019 affected nearly 14 million people,¹⁶ and flooding in California's Central Valley devastated crops in 2023.¹⁷ Every continent has recently experienced similar phenomena.¹⁸

12. CTR. FOR DISASTER RESILIENCE, UNIV. OF MD., & CTR. FOR TEX. BEACHES & SHORES, TEX. A&M UNIV., THE GROWING THREAT OF URBAN FLOODING: A NATIONAL CHALLENGE 42 (2018), https://cdr.umd.edu/sites/cdr.umd.edu/files/resource_documents/COMPRESSEDurban-flooding-report-online-compressed-0319.pdf.

13. U.S. GLOB. CHANGE RSCH. PROGRAM, FIFTH NATIONAL CLIMATE ASSESSMENT 2-11 (2023), <https://nca2023.globalchange.gov/>.

14. *Id.* at 2-18.

15. U.S. GLOB. CHANGE RSCH. PROGRAM, FOURTH NATIONAL CLIMATE ASSESSMENT 74, 88-91 (2018), https://nca2018.globalchange.gov/downloads/NCA4_2018_FullReport.pdf; Megan C. Kirchmeier-Young & Xuebin Zhang, *Human Influence has Intensified Extreme Precipitation in North America*, 117 PNAS 13308 (2020), <https://www.pnas.org/content/117/24/13308>.

16. Sarah Almukhtar et al., *The Great Flood of 2019: A Complete Picture of a Slow-Motion Disaster*, N.Y. TIMES (Sept. 11, 2019), <https://www.nytimes.com/interactive/2019/09/11/us/midwest-flooding.html>.

17. Jonathan Viggiani, *Severe storms have devastating impact on Central California crops*, CBS NEWS (May 11, 2023, 8:57 PM), <https://www.cbsnews.com/news/california-crops-storm-impact/>.

18. See Aijaz Hussain & Sibi Arasu, *What are Cloudbursts and is Climate Change Making Them More Frequent?*, ASSOCIATED PRESS (July 30, 2023, 11:35 AM), <https://apnews.com/article/cloudbursts-india-climate-change-extreme-weather-kashmir->

The First Street Foundation found that 14.6 million properties across the United States (more than ten percent of all properties) now have at least a one-in-one-hundred risk of flooding each year.¹⁹ Another study found that by the end of the 21st century, flooding that occurs at least twenty-six times a year could affect nearly 2.4 million residential properties (currently housing about 4.7 million people) and 107,000 commercial properties, collectively valued at over \$1 trillion.²⁰ But this counts only the buildings that already exist; new construction continues across the country, even in areas already devastated by floods.²¹ Some areas that are at high flood risk are seeing up to three times more construction than safer areas.²²

Hurricanes have been getting more intense since the 1980s, and that trend will continue.²³ While climate change is making hurricanes stronger, it can also slow their movement and even make them almost stand still, continuously drawing water from the ocean like a massive pump and dumping torrents of rain on a single location for days on end.²⁴ That is what happened with Hurricane Harvey over the Houston area in 2017 and Hurricane Dorian over the Bahamas in 2019. As Kerry Emanuel has written, Hurricane Harvey produced the largest rainfall of any U.S. hurricane on record: “[B]y the standards of the average climate during 1981-2000, Harvey’s rainfall in Houston was ‘biblical’ in the sense that it likely

d67ef786514bbe04bad8b48c0f34ae73; Shuai Zhang, *China Sees Record Flooding in Beijing, with 20 Deaths and Mass Destruction Blamed on Typhoon Doksuri*, CBS NEWS (Aug. 2, 2023, 8:05 AM), <https://www.cbsnews.com/news/china-flooding-beijing-2023-deaths-evacuations-typhoon-doksuri/>; Angela Dewan, *Germany’s Deadly Floods were up to 9 Times More Likely because of Climate Change*, study estimates, CNN (Aug. 24, 2021, 5:30 AM), <https://www.cnn.com/2021/08/23/europe/germany-floods-belgium-climate-change-intl/index.html>; Jordis S. Tadrowsky et al., *Attribution of the Heavy Rainfall Events Leading to Severe Flooding in Western Europe during July 2021*, 176 CLIMATIC CHANGE 90 (June 29, 2023); *Australia flood crisis: ‘Once in a century’*, BBC NEWS (Jan. 8, 2023), <https://www.bbc.com/news/av/world-australia-64206297>; Diane Jeantet et al., *Climate change brings extreme, early impact to South America*, ASSOCIATED PRESS (Mar. 1, 2022, 2:01 AM), <https://apnews.com/article/climate-science-caribbean-forests-environment-and-nature-fdb886a31959ad3b30c57bc677a2a8be>.

19. FIRST ST. FOUND., THE FIRST NATIONAL FLOOD RISK ASSESSMENT, (Jun. 28, 2020). A 2023 study by the First Street Foundation increased the 14.6 million figure to 17.7 million for properties currently at significant risk, but did not have a projection for 2050. *See supra* note 5.

20. KRISTINA DAHL ET AL., UNION OF CONCERNED SCIENTISTS, UNDERWATER: RISING SEAS, CHRONIC FLOODS, AND THE IMPLICATIONS FOR US COASTAL REAL ESTATE 4-5 (2018), <https://www.ucsusa.org/sites/default/files/attach/2018/06/underwater-analysis-full-report.pdf>.

21. *Id.*

22. *Id.* at 7; *Ocean at the Door: New Homes and the Rising Sea*, CLIMATE CENT. (July 30, 2019), <https://www.climatecentral.org/report/ocean-at-the-door-new-homes-in-harms-way-zillow-analysis-21953>.

23. FIFTH NATIONAL CLIMATE ASSESSMENT, *supra* note 13, at 2-16.

24. James P. Kossin, *A Global Slowdown of Tropical-cyclone Translation Speed*, 558 NATURE 104 (2018).

occurred around once since the Old Testament was written.”²⁵ Similarly, a low pressure system carrying moisture from the Mediterranean stalled over central Europe in July 2021 and caused devastating flooding over parts of Germany and Belgium.²⁶ Another phenomenon that can cause deluges is “atmospheric rivers”—long streams of water vapor that form approximately one mile up in the atmosphere and can extend thousands of miles before touching down. These, too, are increasing.²⁷

While hurricanes are often thought to do most of their damage through storm surge, some hurricanes, like Harvey did in Houston, cause most of their damage through rain, or “pluvial flooding”. This type of rain-caused flooding “occurs when precipitation intensity exceeds the capacity of natural and engineered drainage systems.”²⁸ This kind of flooding led to destruction in New York City in 2021. Hurricane Ida made landfall as a Category 4 hurricane in Lafourche Parish, east of New Orleans, on August 29, 2021, generating high winds and storm surge.²⁹ It traveled north across inland areas of Alabama, Tennessee, Kentucky, West Virginia, Maryland, Pennsylvania, and New Jersey, and (in what has been called its “second act”) reached New York City on September 1st.³⁰ Just ten days earlier, New York had been hit by Hurricane Henri, which set a record for the most intense rain event in the city’s history at 1.94 inches in one hour.³¹ But Ida shattered Henri’s record by dumping as much as 3.15 inches of rain on the city in one hour.³² The ground was already saturated with water from Henri, causing the flooding from Ida to overwhelm the drainage system and leading to thirteen

25. Kerry Emanuel, *Assessing the Present and Future Probability of Hurricane Harvey’s Rainfall*, 114 PNAS 12681 (2017), <https://doi.org/10.1073/pnas.1716222114>.

26. Kai Kornhuber et al., *When Record-Breaking is the Norm: Mitigating the Impacts of Extreme Rainfall Events in a Changing Climate*, COLUM. CLIMATE SCH.: CLIMATE, EARTH & SOC’Y (Sept. 20, 2021), <https://news.climate.columbia.edu/2021/09/20/when-record-breaking-is-the-norm-mitigating-the-impacts-of-extreme-rainfall-events-in-a-changing-climate/>; Wolfgang Kron et al., *The July 2021 Flood Disaster in Germany*, in HELP GLOB. REP. ON WATER & DISASTERS 12 (2022), https://www.researchgate.net/publication/365375445_The_July_2021_flood_disaster_in_Germany; Mona Hemmati et al., *Enhanced Urban Adaptation Efforts Needed to Counter Rising Extreme Rainfall Risks*, 2 NPJ URB. SUSTAINABILITY 1, 1 (2022), <https://www.nature.com/articles/s42949-022-00058-w>.

27. Xingying Huang et al., *Future precipitation increase from very high resolution ensemble downscaling of extreme atmospheric river storms in California*, 6 SCI. ADVANCES 1, 1 (2020), <https://doi.org/10.1126/sciadv.aba1323>; Michael D. Dettinger & B. Lynn Ingram, *Megastorms Could Drown Massive Portions of California*, SCI. AM. (Jan. 1, 2013), <https://www.scientificamerican.com/article/megastorms-could-down-massive-portions-of-california/>.

28. Bernice R. Rosenzweig et al., *Pluvial flood risk and opportunities for resilience*, 5 WIRES WATER 1, 1 (2018), <https://wires.onlinelibrary.wiley.com/doi/10.1002/wat2.1302>.

29. Kornhuber et al., *supra* note 26.

30. *See id.*

31. Hemmati et al., *supra* note 26, at 1.

32. *Id.*

deaths.³³ The damage in New York was caused by rain alone; storm surge was not involved.³⁴

Where inadequate stormwater controls are in place, extreme rains can lead to desperate measures. In August 2023, Beijing, an inland city, experienced its worst rains in at least 140 years.³⁵ Authorities diverted much of the water to the nearby (and much less politically powerful) city of Zhuozhou, where the water rose up to twenty-three feet, requiring the evacuation of 850,000 people and destroying many homes and businesses.³⁶ Had Beijing had adequate stormwater controls, it might have been able to handle its stormwater without diverting it and overwhelming a neighboring city.

There are four types of flooding: coastal, riverine (also called fluvial), pluvial, and compound (a combination of two or more of the first three).³⁷ All are on the rise.³⁸ Compared to the other types, pluvial flooding has received little attention from the government. It is rarely reflected in official flood maps.³⁹ Unlike coastal flooding, these pluvial floods tend to arrive with little warning, target relatively small areas, and involve a major pounding that might only last a few minutes but can cause sudden and unexpected

33. Kornhuber et al., *supra* note 26.

34. N.Y.C. DEPT OF ENV'T PROT., INCREASING STORMWATER RESILIENCE IN THE FACE OF CLIMATE CHANGE: OUR LONG TERM VISION 2, <https://www.nyc.gov/assets/dep/downloads/pdf/climate-resiliency/increasing-stormwater-resilience-in-the-face-of-climate-change.pdf>; *Hurricane Ida: A Storm of Two Acts*, JBA RISK MGMT., <https://www.jbarisk.com/products-services/event-response/hurricane-ida-a-storm-of-two-acts/> (last visited Mar. 15, 2024).

35. Andy Wong & Huizhong Wu, *Beijing records heaviest rainfall in at least 140 years, causing severe flooding and 21 deaths*, ASSOCIATED PRESS (Aug. 2, 2023, 11:27 PM), <https://apnews.com/article/china-beijing-rainfall-floods-1a8f968799bd539d11f3421010b8f2a9>.

36. Keith Bradsher, *Anger Builds in China as Areas Are Deliberately Flooded to Save Beijing*, N.Y. TIMES (Mar. 5, 2023); Yuanyue Dang, *"The Capital's Moat": Thousands Forced from Homes in China's Hebei Province to ease Flooding in Beijing*, S. CHINA MORNING POST (Aug. 3, 2023, 6:46 PM), <https://www.scmp.com/news/china/politics/article/3229896/capitals-moat-thousands-forced-homes-hebei-ease-flooding-beijing>; Lily Kuo et al., *Rural Areas Sacrificed for Xi Jinping's New City, Satellite Imagery Shows*, WASH. POST (Aug. 31, 2023), <https://www.washingtonpost.com/world/2023/08/31/china-floods-beijing-rain/>.

37. NAT'L CLIMATE TASK FORCE, FEDERAL FLOOD RISK MANAGEMENT STANDARD CLIMATE-INFORMED SCIENCE APPROACH (CISA) STATE OF THE SCIENCE REPORT, at x (2023), <https://www.whitehouse.gov/wp-content/uploads/2023/03/Federal-Flood-Risk-Management-Standard-Climate-Informed-Science-Approach-CISA-State-of-the-Science-Report.pdf> (hereinafter STATE OF THE SCIENCE REPORT).

38. Zbigniew W. Kundzewicz & Iwona Piskwar, *Are Pluvial and Fluvial Flooding on the Rise?*, 14 WATER 1, 2 (2022).

39. STATE OF THE SCIENCE REPORT, *supra* note 37, at 58-59; GOV'T ACCT. OFF., FEMA FLOOD MAPS: BETTER PLANNING AND ANALYSIS NEEDED TO ADDRESS CURRENT AND FUTURE FLOOD HAZARDS 15-16 (2021) <https://www.gao.gov/assets/gao-22-104079.pdf>; Samuel Oakford et al., *America underwater: Extreme floods expose the flaws in FEMA's risk maps*, WASH. POST (Dec. 6, 2022, 11:50 AM) <https://www.washingtonpost.com/climate-environment/interactive/2022/fema-flood-risk-maps-failures/>.

flooding to streets and buildings.⁴⁰ The most intense rainstorms, called *cloudbursts*, pose special challenges to cities whose stormwater systems cannot handle all that water, as discussed below.⁴¹ The damages especially hit disadvantaged communities located in low-lying areas, as those tend to have older infrastructure and fewer resources for recovery.⁴²

B. Precipitation Estimates

The pipes, drainage ditches, pumps, and other elements of a stormwater system all have a finite capacity. The engineers designing the systems decide what size pipes to use and how large to make all of the other elements. This requires the engineers to estimate how much rain will fall. To help them do that, in 1961, the National Oceanic and Atmospheric Administration (“NOAA”) issued Technical Paper 40 (TP-40), Rainfall Frequency Atlas of the United States, which estimated the intensity, duration and frequency of rain for each part of the country.⁴³ This was based on the records of weather stations through 1958.⁴⁴ In 2004, NOAA began updating TP-40 and other interim reports with a new set of publications

40. N.Y.C. MAYOR'S OFF. OF RESILIENCY, NEW YORK CITY STORMWATER RESILIENCY PLAN 11 (2021), <https://www.nyc.gov/assets/orr/pdf/publications/stormwater-resiliency-plan.pdf>.

41. See *infra* note 318 and accompanying text (discussing the implementation of the City of Copenhagen's Cloudburst Management Plan).

42. Thomas Frank, *Flooding Disproportionately Harms Black Neighborhoods*, E&E NEWS (June 2, 2020), <https://www.eenews.net/articles/flooding-disproportionately-harms-black-neighborhoods/>; see Laura Gersony, *In Chicago, Flooding Overwhelmingly Strikes Communities of Color*, CIRCLE OF BLUE (June 29, 2021), <https://www.circleofblue.org/2021/world/in-chicago-flooding-overwhelmingly-strikes-communities-of-color/>; Aydali Campa, *Record-Breaking Rains in Chicago Underscore the Urgency of Flood Resiliency Projects, City Officials Say*, INSIDE CLIMATE NEWS (July 28, 2023), <https://insideclimate.org/news/28072023/record-rain-chicago-flood-resiliency/>; Raymond Zhong, *Many Thousands Facing Risk If Floods in L.A. Are Extreme*, N.Y. TIMES, Nov. 1, 2022, at A11; Juliana Maantay & Andrew Maroko, *Mapping Urban Risk: Flood Hazards, Race, & Environmental Justice in New York*, 29 APPLIED GEOGRAPHY 111 (2009); KATY LACKEY, U.S. WATER ALL., WATER RISING: EQUITABLE APPROACHES TO URBAN FLOODING (2020), https://www.smartcitiescouncil.com/sites/default/files/main/public_resources/water_rising_aper_0.pdf; Kari Lydersen, *Inundation and Injustice: Flooding Presents a Formidable Threat to the Great Lakes Region*, BORDERLESS (Aug. 3, 2023), <https://borderlessmag.org/2023/08/03/inundation-and-injustice-flooding-presents-a-formidable-threat-to-the-great-lakes-region/>.

43. See U.S. DEPT OF COM., TECHNICAL PAPER 40, RAINFALL FREQUENCY ATLAS OF THE UNITED STATES (1961).

44. ENGINEERING FIELD HANDBOOK CHAPTER 2: ESTIMATING RUNOFF AND PEAK DISCHARGES PENNSYLVANIA NOTICE 34 SUPPLEMENT, NAT. RES. CONSERVATION SERV. 1 (2011), <https://www.nrcs.usda.gov/sites/default/files/2022-12/EFH%20page%202-15.A-N%20%28Shown%20as%20202-14.A-N%29.pdf>.

called Atlas 14.⁴⁵ The new estimates were issued one or a few states at a time over a period of twenty years.⁴⁶

For sixty years, engineers have been using TP-40 and, where available, Atlas 14, to help them design stormwater systems. However, like the Federal Environmental Management Agency (“FEMA”) flood maps discussed below, these rain estimates are entirely backward-looking. They are based on the historical record of rainfall for particular places, and some of that record (even in Atlas 14) is quite old for many places. But as a result of climate change, the amount of rainfall in most parts of the country has been increasing.⁴⁷ Atlas 14 is already out of date and will become more so with each passing year. This is now well understood in the engineering community, and some cities and states now undertake their own more refined analysis. However, until at least 2021, there was considerably more wringing-of-hands than action to devise forward-looking projections at a level of detail that can be used in designing stormwater systems.⁴⁸ Most existing drainage systems were designed before Atlas 14, and many even before TP-40.⁴⁹ Sewer infrastructure has a design life of approximately fifty years and a useful life of approximately 100 years,⁵⁰ and therefore many sewer components that were designated even before TP-40 will be in use for decades more to come. Moreover, these studies focused on *average* precipitation over a 24-hour period, and generally did not report on shorter-duration cloudbursts that could cause rapid flooding.⁵¹

Some states have adopted their own rainfall standards. For example, the Illinois State Water Survey published one set of standards in 1989 and updated it in 2020.⁵² The new survey found

45. Jungho Kim et al., *Assessment of the Standard Precipitation Frequency Estimates in the United States*, 44 J. HYDROLOGY: REG'L STUD. 101276, *4 (2022).

46. *Id.*

47. Daniel B. Wright et al., *U.S. Hydrologic Design Standards Insufficient Due to Large Increases in Frequency of Rainfall Extremes*, 46 GEOPHYSICAL RSCH. LETTERS 8144 (2019).

48. *Id.*; Daniel B. Wright et al., *Resilience to Extreme Rainfall Starts With Science*, AM. METEOROLOGICAL SOC'Y (2021); Erfan Ghasemi Tousi et al., *Climate Changes Impact on Stormwater Infrastructure Design in Tucson Arizona*, 72 SUSTAINABLE CITIES & SOC'Y 103014 (2021); e.g., Lauren M. Cook et al., *The Effect of Modeling Choices on Updating Intensity-Duration-Frequency Curves and Stormwater Infrastructure Designs for Climate Change*, 159 CLIMATIC CHANGE 289 (2020).

49. Thomas Frank, *Climate Change Overtakes Archaic NOAA Rain Records*, E&E NEWS, (Jan. 7, 2022).

50. N.Y.C. MAYOR'S OFFICE OF RESILIENCY, *supra* note 40, at 14.

51. FIRST ST. FOUND., *supra* note 5.

52. See HUFF, F. A. & J. R. ANGEL, RAINFALL DISTRIBUTIONS AND HYDROCLIMATIC CHARACTERISTICS OF HEAVY RAINSTORMS IN ILLINOIS (BULLETIN 70), ILLINOIS STATE WATER SURVEY (1989), <https://www.isws.illinois.edu/statecli/rf/download.htm>; JAMES R. ANGEL & MOMCILLO MARKUS, PRAIRIE RSCH. INST: ILL. STATE WATER SURV., ISWS BULLETIN 75:

a substantial increase in storm frequency and intensity in the intervening years, and the new figures are now being used in the design of drainage systems and other facilities in the state.⁵³

The Infrastructure Investment and Jobs Act (IIJA), also known as the Bipartisan Infrastructure Law, signed by President Biden in November 2021, provided money to NOAA to prepare a new version of the rainfall frequency reports, to be called Atlas 15, with volumes to be published in 2026 and 2027.⁵⁴ In December 2022, President Biden signed into law, as part of a short-term spending bill, the Providing Research and Estimates of Changes in Precipitation (PRECIP) Act, which requires NOAA to update its precipitation estimates and the methods it uses to prepare them. The law also requires NOAA to “update probable maximum precipitation estimates for the United States, such that each update considers non-stationarity . . .”⁵⁵ That same month, Biden signed the Flood Level Observation, Operations and Decision Support (FLOODS) Act, calling on NOAA to establish a national integrated flood information system and to research “the role of extreme weather events and climate variability in floods . . .”⁵⁶

Many assumptions go into the calculations about flooding from storms and sometimes disputes arise. In 2017, Wisconsin officials lured the Taiwanese electronics company Foxconn (which makes iPhones and many other devices) to build a massive manufacturing facility, mostly on farmland.⁵⁷ But officials across the border in Lake County, Illinois, were concerned that covering the land with buildings would increase flooding from Wisconsin rivers that had recently damaged more than 3,000 structures in Illinois.⁵⁸ Wisconsin designed its drainage system to handle what it calculated to be the expected rains, but Illinois used different rain data and concluded the drainage system was much too small.⁵⁹ With a dispute brewing between these two states, legislation was introduced in

PRECIPITATION FREQUENCY STUDY FOR ILLINOIS ii, 2 (2020), <https://www.ideals.illinois.edu/items/114209>

53. See Angel & Markus, *supra* note 52; Tiffany Jolley, *The Impact of Bulletin 75, PRAIRIE RSCH. INST: ILL. STATE WATER SURV.* (July 8, 2020, 11:00AM), <https://blogs.illinois.edu/view/7447/2024148035>.

54. NAT'L OCEANIC & ATMOSPHERIC ADMIN., OFF. OF WATER PREDICTION, *NOAA Atlas 15: Update to the National Precipitation Frequency Standard*, https://www.weather.gov/media/owp/hdsc_documents/NOAA_Atlas_15_Flyer.pdf (last visited Feb. 17, 2024).

55. Further Continuing Appropriations and Extensions Act (2023), Pub. L. 117-229, § 602(a)(1).

56. Flood Level Observation, Operations, and Decision Support Act, Pub. L. 117-316, § 3(b)(6)(B).

57. Jim Morrison, *As rainstorms grow more severe and frequent, communities fail to prepare for risks*, WASH. POST (April 9, 2021), <https://www.washingtonpost.com/climate-environment/2021/04/09/climate-change-rainfall/>.

58. *Id.*

59. *Id.*

Congress to fund NOAA to prepare a more comprehensive national rainfall database, and to update it frequently.⁶⁰ This particular dispute faded when Foxconn's plan fizzled for other reasons,⁶¹ but the need for this database remains. With the passage of the IIJA in 2021 and the PRECIP Act in 2022, perhaps it will come to be.

C. Maps and Disclosures

The most important way that many people, including some real estate professionals, assess flood risk is by seeing whether a property is on FEMA's 100-year flood maps. These maps are a misleading and partial guide for several reasons. While most coastal areas are mapped, roughly half of all the flood disaster declarations since 1990 were in landlocked states.⁶² Flood risk maps only exist for about one-third of the nation and many of the maps that do exist are several decades old, or were updated based on obsolete methods.⁶³ One study found that almost 41 million people in the United States live in places with a one-in-one-hundred annual chance of flooding, but only 13 million live in areas on the FEMA 100-year maps.⁶⁴

Without accurate flood maps, many people are unwittingly exposed to floods. For example, Hurricane Harvey damaged more than 204,000 homes and apartment buildings in Harris County, Texas (which includes Houston); almost three-quarters of them were outside the FEMA 100-year flood maps and about 80% of them had no flood insurance.⁶⁵ In 2018, Hurricane Michael demolished

60. *Id.*

61. See Scott Cohn, *After Wisconsin's Foxconn debacle, states and companies rethink giant subsidies*, CNBC (June 29, 2021), <https://www.cnbc.com/2021/06/29/after-wisconsins-foxconn-debacle-states-rethink-giant-subsidies.html>.

62. *Preparing for the Storm: Reauthorization of the National Flood Insurance Program: Hearing Before the H. Comm. on Fin. Servs.*, 116th Cong. 68-73 (2019) [hereinafter *Preparing for the Storm: Hearing*] (testimony of Mabel Guzman, Broker, Nat'l Assoc. of Realtors).

63. Michael Keller et al., *Outdated and Unreliable: FEMA's Faculty Flood Maps Put Homeowners at Risk*, BLOOMBERG (Oct. 6, 2017), <https://www.bloomberg.com/graphics/2017-fema-faulty-flood-maps/>; *Preparing for the Storm: Hearing*, *supra* note 62, at 81-97 (testimony of Maria Cox Lamm, Chair, Ass'n of State Floodplain Managers); *see also FEMA Needs to Improve Management of Its Flood Mapping Programs*, DEPT OF HOMELAND SEC., OFF. OF INSPECTOR GEN. (Sept. 27, 2017), <https://www.oig.dhs.gov/sites/default/files/assets/2017/OIG-17-110-Sep17.pdf>.

64. Oliver E.J. Wing et al., *Estimates of Present and Future Flood Risk in the Conterminous United States*, 13 ENV'T RSCH. LETTERS 1, 1, 3 (2018). Using different methodologies, another study concluded that a total of 14.6 million properties have a 1% annual risk of flooding, but 5.9 million of these are not on the FEMA 100-year flood maps. FIRST ST. FOUND., THE FIRST NATIONAL FLOOD RISK ASSESSMENT *supra* note 19.

65. David Hunn et al., *In Harvey's deluge, most damaged homes were outside the flood plain, new data show*, HOUS. CHRON. (March 30, 2018), <https://www.houstonchronicle.com/news/article/In-Harvey-s-deluge-most-damaged-homes-were-12794820.php>; Bernard

70% of the homes on the coast in Mexico Beach, Florida, in an area where FEMA had characterized the flood risks as minimal.⁶⁶ More than twenty square miles of the area of New York City that was inundated by Hurricane Sandy were outside the mapped flood zone.⁶⁷ A study of flood insurance coverage in Illinois found that over 90% of insurance claims for urban flooding damage from 2007 to 2014 were outside the mapped floodplain.⁶⁸

Some cities and states are acting on their own to protect residents from flooding. New York City is cooperating with FEMA to prepare its own flood maps—but only after having successfully beaten back an earlier effort by FEMA to expand the maps' coverage.⁶⁹ The states of New York and Connecticut have adopted laws requiring the state environmental agencies to adopt their own official sea level rise projections, but these are not specific geographically and do not translate readily into flood maps.⁷⁰ North Carolina has developed maps that divide the state into a grid of 140 million parcels of roughly a quarter-acre each. The maps display the flood risk for each parcel, giving real estate buyers, sellers, and financers a fine-grained sense of the vulnerability of individual properties.⁷¹

Many people buy houses without knowing they are in a flood zone or have been previously damaged by floods. Thirty-one states

Condon & Ken Sweet, *About 80% of Hurricane Harvey Victims do Not Have Flood Insurance, Face Big Bills*, USA TODAY (Aug. 29, 2017), <https://www.usatoday.com/story/money/2017/08/29/hurricane-harvey-houston-flood-insurance-damages-claims/611910001/>.

66. James Bruggers, *FEMA Flood Maps Ignore Climate Change, and Homeowners Are Paying the Price*, INSIDE CLIMATE NEWS (Nov. 1, 2018), <https://insideclimatenews.org/news/01112018/fema-flood-map-climate-change-hurricane-mexico-beach-florida-sea-level-rise/>.

67. KIM KNOWLTON & MIRIAM ROTKIN-ELLMAN, NAT'L RES. DEFENSE COUNCIL, PREPARING FOR CLIMATE CHANGE: LESSONS FOR COASTAL CITIES FROM HURRICANE SANDY 6 (2014).

68. BRAD A. WINTERS, ILL. DEPT' OF NAT. RES., REPORT FOR THE URBAN FLOODING AWARENESS ACT 8 (2015), <https://dnr.illinois.gov/content/dam/soi/en/web/dnr/water/resources/documents/final-ufaa-report.pdf>.

69. Liz Koslov, *How Maps Make Time: Temporal Conflicts of Life in the Flood Zone*, 23 CITY 658 (2019); 100 RESILIENT CITIES, STRENGTHENING THE NATIONAL FLOOD INSURANCE PROGRAM 9 (2017).

70. Michael B. Gerrard & Edward McTiernan, *New York's New Sea Level Rise Projections Will Affect Land Use, Infrastructure*, N.Y. L.J. (Mar. 9, 2017), <http://columbiaclimatelaw.com/files/2017/03/070031715-Arnold.pdf>; 2018 Conn. Pub. Acts No. 18-82; E.A. Cruden, *Acknowledging Sea Level Rise, Connecticut Legislature Passes Sweeping Climate Change Bill*, THINK PROGRESS (May 9, 2018, 4:04 PM); see also James Bruggers, *Not Trusting FEMA's Flood Maps, More Storm-Ravaged Cities Set Tougher Rules*, INSIDECLIMATE NEWS (Mar. 19, 2019), <https://insideclimatenews.org/news/19032019/fema-flood-maps-risk-zones-cities-climate-change-mexico-beach-houston-outer-banks/>.

71. Thomas Frank, *Precise Flood Maps Lure Insurers into Risky Market*, CLIMATEWIRE (Dec. 19, 2019), <https://www.eenews.net/climatewire/stories/1061847687?t=https%3A%2F%2Fwww.eenews.net%2Fstories%2F1061847687>; NORTH CAROLINA FLOOD RISK INFORMATION SYSTEM, <https://fris.nc.gov/fris/Home.aspx?ST=NC> (last visited Mar. 16, 2024).

have some sort of law requiring disclosure of flood risks to buyers,⁷² but the quality of flood-risk information that must be disclosed varies widely. Often, the disclosures can be waived if the seller pays a modest fee.⁷³ Without legal compulsion or liability risk, real estate brokers have little incentive to make sure buyers are fully aware of flood risks, because doing so could kill a sale and most brokers are paid only at the time of sale. Seven states require disclosure of flood risk not only to prospective buyers but also prospective tenants.⁷⁴ At least one county (Miami-Dade, Florida) requires notice to buyers if the property is in the county's special flood hazard area.⁷⁵ In 2021, Hawaii went even further by enacting a law requiring sellers of residential properties to inform prospective buyers if the land is in an area that has been officially identified as vulnerable to sea level rise.⁷⁶

In 2015, President Obama issued an executive order, inspired by the experience with 2012's Hurricane Sandy, which provided:

agencies which guarantee, approve, regulate, or insure any financial transaction which is related to an area located in an area subject to the base flood shall, prior to completing action on such transaction, inform any private parties

72. *How States Stack Up on Flood Disclosure*, NAT. RES. DEF. COUNCIL (Aug. 31, 2023), <https://www.nrdc.org/resources/how-states-stack-flood-disclosure>; see Michael B. Gerrard & Edward McTiernan, *New York, New Jersey Adopt Laws Requiring Flood Disclosure to Homebuyers, Tenants*, N.Y. L.J. (Nov. 9, 2023), https://scholarship.law.columbia.edu/cgi/viewcontent.cgi?article=5200&context=faculty_scholarship.

73. Kevin Wozniak et al., *Florida's Coastal Hazards Disclosure Law: Property Owner Perceptions of the Physical and Regulatory Environment*, FLA. SEA GRANT (2012), <https://repository.library.noaa.gov/view/noaa/35330>. In 2023 the New York and New Jersey legislatures increased the required flood disclosures. Gerrard & McTiernan, *supra* note 72.

74. Dan Mathis, *Risky Renting: Renters Should Have the Right to Know their Flood Risk*, NEXT100 (May 26, 2022), <https://thenext100.org/risky-renting-renters-should-have-the-right-to-know-their-flood-risk/>; Thomas Frank, *Texas Enacts Nation's Strongest Flood Disclosure Law*, CLIMATEWIRE (Jan. 6, 2022), <https://www.eenews.net/articles/texas-enacts-nations-strongest-flood-disclosure-law/>; Niki L. Pace, *Unaware, Unprepared, and Unexpectedly Flooded: Improving Louisiana's Capacity to Respond to Flood Hazards*, 6 LA. STATE U. J. ENERGY L. & RES. 121 (2017); Governor Murphy Signs Bill Requiring Provision of Critical Flood Risk Information for Homeowners and Renters, STATE OF N.J., OFF. OF GOVERNOR PHIL MURPHY, (July 3, 2023), <https://www.nj.gov/governor/news/news/562023/20230703d.shtml>; Samantha Maldonado, *Landlords Will Soon Have to Inform Tenants About Flood Risks*, THE CITY (May 30, 2023, 5:00 AM), <https://www.thecity.nyc/2023/05/30/renting-nyc-flood-risks-landlords-tenants/>.

75. Thomas Ruppert, *Reasonable Investment-Backed Expectations: Should Notice Of Rising Seas Lead To Falling Expectations For Coastal Property Purchasers?*, 26 J. LAND USE & ENV'T L. 239, 265 (2011).

76. S. 474, 31st Leg. (Haw. 2021); see also Sophie Cocke, *Some Hawaii Homeowners Damage Beaches to Protect Their Homes. A New Law Could Help Change That*, HONOLULU STAR-ADVERTISER (July 2, 2021), <https://www.propublica.org/article/some-hawaii-home-owners-damage-beaches-to-protect-their-homes-a-new-law-could-help-change-that>.

participating in the transaction of the hazards of locating structures in the area subject to the base flood.⁷⁷

In 2017, two weeks before Hurricane Harvey, President Trump rescinded this order.⁷⁸ President Biden reinstated it in 2021.⁷⁹

A federal law requiring disclosures to buyers of flood risks and prior flood damage would make a great deal of sense.⁸⁰ Homes that already have a history of flooding have been found to incur, on average, tens of thousands of dollars in damages over a 30-year period, depending on location.⁸¹ In 2023, New York adopted a law requiring disclosure of prior flooding history in home sales.⁸² One bill to reauthorize the National Flood Insurance Program would make such insurance available only in places where the state or city has adopted a requirement that flood hazards be disclosed to prospective property buyers.⁸³

For starters, Congress should modify the provision of the Privacy Act of 1974 that bars FEMA from revealing a property's flood insurance claim history to anyone but the homeowner, and that prevents local governments from disclosing the addresses of properties that have suffered repetitive flood losses.⁸⁴ Additionally, federal agencies should revisit practices they adopted after 9/11 restricting the public availability of maps showing which areas

77. Exec. Order No. 13,690, 80 Fed. Reg. 6425 (Jan. 30, 2015); *see also* Kathryn Firsching, *The New Federal Flood Risk Management Standard: Will It Lead to Improved Resiliency in America's Floodplains?*, 31 NAT. RES. & ENV'T 26 (2017).

78. Kriston Capps, *Trump Rolled Back the Government's Best Flood Protection Standard*, BLOOMBERG CITYLAB (Aug. 28, 2017), <https://www.bloomberg.com/news/articles/2017-08-28/trump-removed-flood-protection-standard-weeks-before-harvey>.

79. Exec. Order No. 14030, 80 Fed. Reg. 6425 (May 20, 2021).

80. Laura Lightbody, *Home Sellers Should Disclose Flood History and Risk to Buyers*, PEW TRUSTS (Jan. 17, 2017), <https://www.pewtrusts.org/en/research-and-analysis/articles/2017/01/17/home-sellers-should-disclose-flood-history-and-risk-to-buyers>.

81. David D. Evans & Larry Baeder, *Estimating Undisclosed Flood Risk in Real Estate Transactions: Financial Implications for Single-Family Home Buyers in New Jersey, New York, and North Carolina*, MILLIMAN (Aug. 1, 2022), https://www.milliman.com-/media/milliman/pdfs/2022-articles/7-29-22_nrdc-estimating-undisclosed-flood-risk.ashx.

82. 2023 N.Y. LAWS 484, amending N.Y. REAL PROP. LAW §462(2) (McKinney 2023).

83. A Bill to Reauthorize the National Flood Insurance Program, S. 2143, 118th Cong. §416 (2023), https://www.menendez.senate.gov/imo/media/doc/nfip_reauthorization_act_of_2023.pdf. There has long been a federal law requiring disclosure of lead paint,⁸⁵ and some states require disclosure to sellers of other "specified conditions such as asbestos, lead paint, termites, septic systems", and toxic contamination. Lead-Based Paint Poisoning Prevention in Certain Residential Structures, 24 C.F.R. pt. 35; 40 C.F.R. pt. 745; Dennis Binder, *The Duty to Disclose Geologic Hazards in Real Estate Transactions*, 1 CHAPMAN L. REV.13 (1998).

84. 5 U.S.C. § 552a(b); Abigail Darlington, *Little-Known Federal Law Keeps Buyers from Finding Out if a Home Routinely Floods*, POST & COURIER (Aug. 9, 2018), https://www.postandcourier.com/news/little-known-federal-law-keeps-buyers-from-finding-out-if-a-home-routinely-floods/article_9e348564-9b13-11e8-934c-6ffa499e136b.html; *One Question Every Homebuyer Should Ask But Never Does*, BETTER FLOOD INSURANCE (June 18, 2021), <https://betterflood.com/blog/one-question-every-homebuyer-should-ask-but-never-does/>.

could be inundated if a dam or levee broke.⁸⁵ Agencies have successfully argued in court that this kind of information is exempt from disclosure under the Freedom of Information Act because it would help terrorists find the best targets,⁸⁶ but this policy also means people are unaware of the flood risk they face.

Governments are not the only sources of this information. Several private companies in the U.S. are now combining their own fine-grained flood mapping with geographic information system coordinates and real estate transaction data to offer information to the public about the flood and wildfire risk of specific addresses.⁸⁷ Some services require payment, while some are free. New York City has developed its own website that provides address-specific flood information.⁸⁸

It is not yet standard practice in real estate transactions to look beyond FEMA flood maps in examining flood risk. In contrast, sophisticated buyers of commercial or industrial property will typically use one of the commercial services that identifies the known locations of soil or groundwater contamination on or near the site, as acquisition of contaminated property could lead to a legal obligation to clean it up, or to liability to third parties.⁸⁹ But no such obligation or liability is usually associated with acquisition or sale of property that is prone to flooding. In the U.K., unlike the U.S., land surveyors not only check the metes and bounds of a property, but also the environmental conditions and suitability of that property, including flood risk.⁹⁰

FEMA flood maps tend not to show flooding caused by overwhelmed stormwater systems. A 2019 report from the National Academies of Science, prepared at the request of FEMA, found that a “new generation of flood maps and visualizations that integrate

85. *Preparing for the Storm: Hearing*, *supra* note 62, at 81-97 (testimony of Maria Cox Lamm, Ass'n of State Floodplain Managers).

86. *Living Rivers v. U.S. Bureau of Reclamation*, 272 F. Supp. 2d 1313, 1321 (D. Utah 2003); *Pub. Emps. for Env't. Resp. v. U.S. Section, Int'l Boundary & Water Comm'n*, 740 F.3d 195, 202 (D.C. Cir. 2014).

87. See Jesse M. Keenan, *A Climate Intelligence Arms Race in Financial Markets*, 365 SCI. 1240 (2019); Madison Condon, *Climate Services: The Business of Physical Risk*, 55 ARIZ. STATE L.J. 147 (2023).

88. N.Y.C. FLOOD HAZARD MAPPER, <https://www.nyc.gov/site/planning/data-maps/flood-hazard-mapper.page>.

89. See generally Joseph Philip Forte, *Environmental Due Diligence: A Guide to Liability Risk Management in Commercial Real Estate Transactions*, 5 FORDHAM L. REV 349 (2011).

90. *Choosing a Flood Surveyor – Flood Protection Solutions*, FLOOD PROT. SOLS. (Jan. 30, 2019), <https://www.floodprotectionsolutions.co.uk/free-flood-surveys/>; RESIDENTIAL PROP. SURVEYORS ASSOC., <https://www.rpsa.org.uk/>.

predictions and local observations of flood extent and impact is needed to communicate urban flood risk.”⁹¹ It also declared,

The current costs and impacts of urban flooding merit national attention. Further, flood problems are likely to get worse with continued urban development and population growth in urban areas, as well as with climate change, which is increasing sea-level rise and the frequency of heavy precipitation events. Multiagency and cross-jurisdictional efforts are needed to analyze urban flood hazard, advance understanding of social impacts, and communicate urban flood hazard and flood risk.⁹²

In 2021, New York City released a set of maps showing the locations most vulnerable to rain-driven flooding under two different greenhouse gas emissions scenarios, and announced that it was working on integrating those maps with coastal maps.⁹³ Cambridge, Massachusetts, has posted a set of maps with similar information.⁹⁴ Reasonably accurate maps of expected flooding (as opposed to rainfall) would benefit greatly from detailed information about the city’s stormwater systems, such as the size and location of pipes and outfalls; this information is seldom available.

II. GOVERNANCE

The United States has nothing approaching a comprehensive law on urban flooding. The closest thing we have is the Clean Water Act’s stormwater rules, but those are chiefly about water quality, not quantity. Each level of government plays a role, but the sum of all these roles is immensely less than what is needed to address the problem. This is partly due to the challenges posed by climate change. There are increasing calls for “adaptive governance”—ongoing adjustments to the way we manage resources to reflect new developments and learning—but that is beyond the scope of this article.⁹⁵

91. COMM. ON URBAN FLOODING IN THE U.S., NAT’L ACADS. OF SCIS., ENG’G, MED., FRAMING THE CHALLENGE OF URBAN FLOODING IN THE UNITED STATES 6 (2019).

92. *Id.* at 7.

93. N.Y.C. MAYOR’S OFFICE OF RESILIENCY, *supra* note 40.

94. *Understanding Flood Risks & Protecting Your Property*, CITY OF CAMBRIDGE, <https://www.cambridgema.gov/Services/FloodMap>.

95. See Jonathan Rosenbloom, *Fifty Shades of Gray Infrastructure: Land Use and the Failure to Create Resilient Cities*, 93 WASH. L. REV. 317, 371 (2018); Carl Folke et al., *Adaptive Governance of Social-Ecological Systems*, 30 ANN. REV. ENV’T & RES. 441 (2005).

A. Federal Government

The National Flood Insurance Act of 1968,⁹⁶ the Flood Disaster Protection Act of 1973,⁹⁷ and later amendments made FEMA the federal agency that is most concerned with flooding. It spends billions of dollars assisting communities in recovering from floods and other disasters. It also administers the National Flood Insurance Program (NFIP), which provides subsidized flood insurance to owners of property located in Special Flood Hazard Areas if their communities adopt certain land use policies, including building and zoning codes that reduce flood risks, among other requirements.⁹⁸ The office of the Federal Insurance Administrator (a FEMA official) has established various land use and building standards that communities are supposed to adopt in order to be eligible for federal flood insurance.⁹⁹ Communities are rarely audited for compliance with this requirement, and a 2020 study found that, in the prior decade, FEMA had paid more than \$1 billion in flood claims for damage to homes in communities that were in violation of the standards—an amount far larger than what a good auditing program would have cost.¹⁰⁰ If a city is somehow found to be in violation, it seldom receives serious penalties; reflecting its limited enforcement powers, FEMA instead has a “cooperative enforcement” model, which sounds like a contradiction in terms.¹⁰¹

Most of these standards have not been updated since the 1970s but, in 2021, FEMA launched a rulemaking process to update them in response to a petition from NRDC and the Association of State Floodplain Managers.¹⁰²

For places that go above and beyond the minimum requirements, FEMA provides steep insurance discounts through

96. National Flood Insurance Act of 1968, Pub. L. 90-448, 83 Stat. 572 (1968).

97. Flood Disaster Protection Act of 1973, Pub. L. 93-234, 87 Stat. 975 (1973).

98. 44 C.F.R. §§ 59.22, 60 (2009). It should be noted that not all NFIP and private flood insurance policies cover all sewer back-ups; separate riders may need to be purchased. WINTERS, *supra* note 68, at 57-59.

99. 44 C.F.R. pt. 60 (2009); *see also* FED. EMERGENCY MGMT. AGENCY, FLOODPROOFING NON-RESIDENTIAL BUILDINGS (July 2013), https://www.fema.gov/sites/default/files/2020-07/fema_p-936_floodproofing_non-residential_buildings_110618pdf.pdf.

100. Christopher Flavelle & John Schwartz, *Cities Are Flouting Flood Rules. The Cost: \$1 Billion.*, N.Y. TIMES (Apr. 9, 2020), <https://www.nytimes.com/2020/04/09/climate/fema-flood-insurance.html>.

101. Dena Adler et al., *Changing the National Flood Insurance Program for a Changing Climate*, 49 ENV'T L. REP. 10320, 10331-32 (2019); Mark Collette, *Flood Games: Manipulation of Flood Insurance Leads to Repeat Disasters*, HOUS. CHRON. (July 9, 2018), <https://www.houstonchronicle.com/business/article/Flood-Games-How-victims-local-officials-and-an-13031069.php>.

102. Joel Scata, *FEMA Moves to Reform Flood Insurance Program*, NAT'L RES. DEF. COUNCIL (Oct. 14, 2021), <https://www.nrdc.org/bio/joel-scata/fema-moves-reform-flood-insurance-program>.

its Community Rating System. Very few municipalities have joined the program; of more than 22,000 communities participating in the NFIP, only five percent get credits under the Community Rating System.¹⁰³ The Community Rating System's involvement in stormwater is focused on erosion and runoff controls at new developments and on maintenance of drainage systems.¹⁰⁴

Owners of properties in Special Flood Hazard Areas with federally backed mortgages are supposed to buy flood insurance policies, but there is widespread noncompliance.¹⁰⁵

The EPA also plays an important role in flood response management, though its role is driven more by pollution than flooding. After Congress enacted what is now called the Clean Water Act in 1972 (over President Nixon's veto), the newly formed EPA focused on "point sources" of water pollution, such as pipes, and exempted "nonpoint sources" such as stormwater from the need for permits. But stormwater is a significant source of pollution; it picks up oil and other contamination as it washes over streets, construction sites, and other surfaces on its way to the river. In 1977, the D.C. Circuit ruled this exemption to be unlawful.¹⁰⁶ The EPA still moved slowly in regulating stormwater and, in 1987, Congress amended the Clean Water Act and put the EPA on a strict timetable to implement stormwater regulations.¹⁰⁷ The EPA started by requiring larger cities, and then smaller cities and towns as well as industrial and construction sites, to come up with plans to control stormwater.¹⁰⁸ In 1994, the EPA issued its Combined Sewer Overflow Policy to specify how cities are supposed to make sure untreated sewage is not released during storms¹⁰⁹ and, in 2000, Congress further amended the Clean Water Act to require compliance with this policy.¹¹⁰ Not all cities complied, and the EPA began taking limited enforcement action. The principal concern, as discussed below, was that stormwater combined with sewage can

103. Adler et al., *supra* note 101, at 10325.

104. FED. EMERGENCY MGMT. AGENCY, NATIONAL FLOOD INSURANCE PROGRAM COMMUNITY RATING SYSTEM COORDINATOR'S MANUAL, OMB NO. 1660-0022, §§450 (stormwater management), 540 (drainage system maintenance) (2017).

105. Thomas Frank, *Thousands of FHA-Backed Mortgages Lack Flood Insurance*, CLIMATEWIRE, (Apr. 1, 2022), <https://www.eenews.net/articles/thousands-of-fha-backed-mortgages-lack-flood-insurance/>; U.S. GOV'T ACCOUNTABILITY OFF., NATIONAL FLOOD INSURANCE PROGRAM: CONGRESS SHOULD CONSIDER UPDATING THE MANDATORY PURCHASE REQUIREMENT (2021).

106. Nat. Res. Def. Council v. Costle, 568 F.2d 1369, 1379 (D.C. Cir. 1977).

107. 33 U.S.C. § 1342(p)(3).

108. Caswell F. Holloway et al., *Solving the CSO Conundrum: Green Infrastructure and the Unfulfilled Promise of Federal-Municipal Cooperation*, 38 HARV. ENV'T L. REV. 335 (2014).

109. Combined Sewer Overflow (CSO) Control Policy, 59 Fed. Reg. 18688 (Apr. 19, 1994).

110. 33 U.S.C. § 1342(q).

exceed the capacity of wastewater treatment plants, causing untreated sewage to flow into rivers, lakes, and oceans. The EPA also worries about the pollution that stormwater picks up along the way. Its focus is on the quality of the water, not the quantity—on pollution, not flooding.

The U.S. Army Corps of Engineers has major responsibility for civil works such as dams and levees, and it issues permits for construction in navigable waterways under the Rivers and Harbors Act of 1899¹¹¹ and for dredging and filling in “waters of the United States” under the Clean Water Act.¹¹² It will generally only get involved in urban water damage problems under its flood control authorities if the flood discharge is greater than 800 cubic feet per second for a flood that has a ten percent chance of happening in a given year.¹¹³

In January 2015, President Obama issued Executive Order 13690, Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input, which declared, “It is the policy of the United States to improve the resilience of communities and Federal assets against the impacts of flooding. These impacts are anticipated to increase over time due to the effects of climate change and other threats.”¹¹⁴ Substantively, it strengthened the process of protecting federal buildings and other federal assets from flooding. President Trump rescinded this order in August 2017,¹¹⁵ and President Biden reinstated it in May 2021.¹¹⁶

The IIJA provides approximately \$34.7 billion toward enhanced flood mitigation, resilience, and disaster preparedness programs.¹¹⁷ The Inflation Reduction Act, signed by President Biden in August 2022, is not specifically aimed at flooding but includes several billion

111. 33 U.S.C. § 403.

112. 33 U.S.C. § 1344.

113. 33 C.F.R. § 238.7(a); U.S. ARMY CORPS OF ENG’RS, FLOOD DAMAGE REDUCTION MEASURES IN URBAN AREAS, <https://www.nap.usace.army.mil/Portals/39/docs/Civil/Takoony/Flood%20Damage%20Reduction%20Measures.pdf> (last visited Feb. 16, 2024).

114. Exec. Order No. 13690, 80 Fed. Reg. 6425 (Jan. 30, 2015).

115. Exec. Order No. 13807, 82 Fed. Reg. 40463 (Aug. 15, 2017).

116. Exec. Order No. 14030, 86 Fed. Reg. 27967 (May 20, 2021). The evolution of Presidential executive orders on climate change is traced in Robin Kundis Craig, *Climate Adaptation Law and Policy in the United States*, 9 FRONTIERS IN MARINE SCI. 1059734 (2022).

117. *The bipartisan infrastructure bill will create flood-resilient communities – here’s how*, AM. FLOOD COAL. (Nov. 15, 2021), <https://floodcoalition.org/2021/11/the-bipartisan-infrastructure-bill-will-create-flood-resilient-communities-heres-how/>.

dollars for a variety of programs that could be used for climate adaptation, including to address flooding.¹¹⁸

B. States

The Clean Water Act operates under a system of “cooperative federalism” in which the states may implement the federal permit programs. Most states have delegation agreements with the EPA to implement EPA stormwater rules.¹¹⁹

Several states have taken positive actions on their own to prepare for the impacts of climate change.¹²⁰ For example, in 2014, New York enacted the Community Risk and Resiliency Act,¹²¹ which required the state to adopt official sea level rise projections (which it did¹²²) and to consider sea level rise in state government decisions (which it has sometimes done¹²³). The state legislatures of Connecticut¹²⁴ and Florida¹²⁵ enacted statutes and the governor of Rhode Island signed an executive order¹²⁶ calling for systematic action to prepare for sea level rise. Some of the most comprehensive actions have been taken by California, which has adopted and periodically updates a detailed climate adaptation strategy, as required by an executive order by former governor Jerry Brown.¹²⁷

118. Sarah Gimont, *Legislative Analysis for Counties: The Inflation Reduction Act*, NAT'L ASSOC. OF CNTYS. (Feb. 22, 2023), <https://www.naco.org/resources/legislative-analysis-counties-inflation-reduction-act>; *What the Inflation Reduction Act means for flood resilience*, AM. FLOOD COAL. (Aug. 30, 2022), <https://floodcoalition.org/2022/08/what-the-inflation-reduction-act-means-for-flood-resilience/#:~:text=Specifically%20the%20Inflation%20Reduction%20Act,technical%20assistance%20within%20underserved%20communities>.

119. *NPDES Stormwater Program*, ENV'T PROT. AGENCY, <https://www.epa.gov/npdes/npdes-stormwater-program> (last visited Feb. 16, 2024).

120. This is different from state laws to reduce greenhouse gas emissions; about 25 states have those. *U.S. State Greenhouse Gas Emissions Targets*, CTR. FOR CLIMATE & ENERGY SOLS., <https://www.c2es.org/document/greenhouse-gas-emissions-targets/> (last visited Feb. 16, 2024).

121. A6558B, Assemb., 2013-2014 Reg. Sess. (N.Y. 2013); Michael B. Gerrard, *New Statute Requires State Agencies to Consider Climate Risks*, N.Y. L.J. (Nov. 13, 2014).

122. Gerrard & McTiernan, *supra* note 70.

123. See *New York State Climate Law Tracker*, SABIN CTR. FOR CLIMATE CHANGE L., <https://climate.law.columbia.edu/content/new-york-state-climate-law-tracker>.

124. Conn. Pub. Act No. 18-82 (2018); see also E.A. Cruden, *Acknowledging sea level rise, Connecticut legislature passes sweeping climate change bill*, THINK PROGRESS, (May 9, 2018), <https://archive.thinkprogress.org/connecticut-climate-change-sea-level-rise-6ec048453ad3/>; Erin Flannery Keith, *New England Laws Meet Rising Seas with Yankee Ingenuity*, 37 NAT. RES. & ENV'T 50, 50-52 (2023).

125. S.B. 178 (2020); S.B. 1954 (2021); see also Zachary T. Sampson & Kirby Wilson, *DeSantis signs landmark Florida sea level rise bills into law*, TAMPA BAY TIMES (May 12, 2021), <https://www.tampabay.com/news/florida-politics/2021/05/12/desantis-signs-landmark-florida-sea-level-rise-bills-into-law/>.

126. R.I. Executive Order No. 17-10: *Action Plan to Stand up To Climate Change*, (Sep. 15, 2017), <https://governor.ri.gov/executive-orders/executive-order-17-10>.

127. CAL. NAT. RES. AGENCY, *SAFEGUARDING CALIFORNIA PLAN: 2018 UPDATE – CALIFORNIA CLIMATE ADAPTATION STRATEGY*, 1 (2018), <https://www.srta.ca.gov/DocumentCenter/View/4762/Safeguarding-California-Plan-2018-Update>.

Louisiana has also taken comprehensive action. Its Comprehensive Master Plan for a Sustainable Coast was mandated by the state legislature after Hurricanes Katrina and Rita in 2005, and has been periodically updated.¹²⁸

But these are exceptions. While about 20 states have issued climate adaptation plans of some sort,¹²⁹ only a few state legislatures have enacted laws addressing climate change adaptation, and the vast majority of municipalities are laggards. This is especially so with respect to waterfront areas where property values are high and owners often have the political clout to block restrictions on development.¹³⁰

States must prepare hazard mitigation plans as a condition of receiving certain federal grants to help them prepare for and recover from future disasters. In 2016, FEMA issued guidance making it clear that these plans should consider future climate conditions.¹³¹ A 2019 survey of these plans from all 50 states and three U.S. territories found that 49 of the 53 jurisdictions explicitly recognize and discuss climate change in their plans, and most had improved the plans' consideration of climate change since a prior survey six years earlier.¹³² The quality of the plans varied considerably, with Kentucky, South Carolina, Texas, and Wyoming at the bottom of the heap, and California, Colorado, Connecticut, Hawaii, Massachusetts, Minnesota, Oregon, New York, Rhode Island, Vermont, and Washington getting the top rating.¹³³

C. Local Governments

Local governments have the principal responsibility for dealing with urban flooding. They build and operate the sewage and drainage systems, sometimes with federal assistance.¹³⁴ But the increased precipitation that will be caused by climate change in the coming decades will put enormous strains on systems that are

128. LA. REV. STAT. § 49:214.5.3 (2018).

129. See *State Adaptation Progress Tracker*, GEO. CLIMATE CTR., <https://www.georgetownclimate.org/adaptation/plans.html>.

130. See Sarah J. Adams-Schoen, *Beyond Localism: Harnessing State Adaptation Lawmaking to Facilitate Local Climate Resilience*, 8 MICH. J. ENV'T. & ADMIN. L. 185 (2018).

131. See Dena P. Adler & Emma Gosliner, *State Hazard Mitigation Plans & Climate Change: Rating the States 2019 Update*, SABIN CTR. FOR CLIMATE CHANGE L. 4-6 (2019).

132. *Id.*

133. *Id.*

134. See, e.g., *Local Government Strategies for Mitigating the Risks of Flooding*, CMTY. & ECON. DEV. IN N.C. & BEYOND (Feb. 24, 2015), <https://ced.sog.unc.edu/2015/02/local-government-strategies-for-mitigating-the-risks-of-flooding/>; LOCAL ELECTED AND APPOINTED OFFICIALS GUIDE: ROLE AND RESOURCES IN EMERGENCY MANAGEMENT, FED. EMERGENCY MGMT. AGENCY (2022), https://www.fema.gov/sites/default/files/documents/fema_local-elected-officials-guide_2022.pdf.

poorly equipped to deal with even today's storms. Retrofitting existing drainage systems or building new ones is extremely expensive and would strain or break many municipal budgets.

Responsibility for dealing with flooding tends to be spread across multiple local agencies. In New York, for example, the Department of Environmental Protection maintains the sewer system; the Department of Emergency Management activates emergency plans and coordinates agencies; the Department of Transportation maintains the catch basins on arterial roads; the Department of Sanitation clears catch basins on minor roadways; the Metropolitan Transportation Authority maintains the subways, and so on.¹³⁵ These agencies plan in silos with limited coordination and general oversight.¹³⁶

Some cities and counties have elaborate plans to reduce storm flows. In places where flooding is a regional problem, some municipalities have come together to form regional stormwater management boards or at least plans to form such boards.¹³⁷ Several counties in Illinois were found to have effective stormwater plans.¹³⁸ New York City has several consent decrees with the state environmental department to bring it into compliance with Clean Water Act requirements for stormwater. In 2022, the city adopted a Unified Stormwater Rule, which applies to all development projects that involve the disturbance of 20,000 square feet or more of soil or the creation of 5,000 square feet or more of impervious surface, and to all projects requiring a new sewer connection. Subject projects must use vegetated retention projects (discussed below) to the maximum extent practical.¹³⁹ A severe but necessary limitation is that the rule only applies to new construction projects, and 70% of

135. REBUILD BY DESIGN & ONE ARCHITECTURE, TOWARD A RAINPROOF NEW YORK CITY: TURNING THE CONCRETE JUNGLE INTO A SPONGE 20 (July 2022), <https://rebuildbydesign.org/wp-content/uploads/2022/09/Toward-a-Rianproof-NYC-Compressed.pdf> (hereinafter TOWARD A RAINPROOF NEW YORK CITY).

136. *Id.* at 24.

137. *E.g.*, Passaic Valley (New Jersey) Regional Flood Control Board, BOROUGH OF WOODLAND PARK, <http://www.wpnj.us/content/167/337/default.aspx> (last visited Mar. 16, 2024); Feather River Region (California) Regional Flood Management Plan, CAL. DEP'T OF WATER RES., <https://www.yubawater.org/DocumentCenter/View/3223/Feather-River-Region-Regional-Flood-Management-Plan?bidId=->; Clark County (Nevada) Regional Flood Control District, FED. EMERGENCY MGMT. AGENCY, <https://www.fema.gov/es/node/453824> (last visited Mar. 16, 2024); Pajaro (California) Regional Flood Management Agency, CALIFORNIALOCAL <https://californialocal.com/localnews/monterey/ca/government/show/185-pajaro-regional-flood-management-agency/overview/> (last visited Mar. 16, 2024). Texas has formed fifteen Regional Flood Planning Groups; *see Lower Red Basin, LOWER RED-SULPHUR-CYPRESS*, <https://lowerreddsulphurcypress.halff.com/> (last visited Mar. 16, 2024).

138. WINTERS, *supra* note 68, at 33-38.

139. 15 R.C.N.Y. § 19.1-03.4; *see* Karen Mintzer et al., *New Unified Stormwater Rule in NYC: Why Now and What Developers Need to Know*, 42 N.Y. ENV'T L. at 27 (2022); *infra* Section III(C) ("Storage") (describing vegetated retention projects and other storage measures).

the city—the “concrete jungle”—is already built up with impervious surface.¹⁴⁰

III. PHYSICAL COPING MECHANISMS

The physical means by which cities can cope with flooding can be divided into six categories:

1. Grey infrastructure: pipes and other devices to convey water to a receiving water body
2. Infiltration: having the water seep into the ground
3. Storage: holding the water for a time and releasing it gradually
4. Defense: barriers to hold back the water
5. Accommodation: arrangements that allow the water to enter without inflicting damage
6. Retreat: moving residences and other activities away from flood-prone areas

The magnitude of current and future floods is such that no one or two of these methods will be sufficient; some combination of all six will be needed. Each of these measures and its legal implications will now be discussed in turn.

A. Grey Infrastructure

Just about every city has street drains and pipes that carry rainwater to a nearby river or other body of water. In more than seven hundred (mostly older) cities, the pipes also receive sewage and send the combined flows to a sewage treatment plant.¹⁴¹ When it rains, the combination of rainwater and sewage can exceed the capacity of the collection system and the plant, and untreated sewage needs to flow into the river; the plants are designed to let that happen.¹⁴² That’s why it is a particularly bad idea to swim near a sewage treatment plant outfall after it rains. Whether the stormwater pipes are separate or combined, they can only handle a certain amount of water. If it rains so hard as to exceed the capacity

140. *Info Box “Did You Know?”*, RESILIENT NYC PARTNERS, N.Y.C. DEP’T OF ENV’T PROT., <https://www.nyc.gov/site/dep/whats-new/resilient-nyc-partners.page>; 15 R.C.N.Y § 19.1-01.1 (stating that the rules apply to “covered development projects”); id. § 19.1-01.2 (defining “covered development project”).

141. U.S. ENV’T PROT. AGENCY, GREENING CSO PLANS: PLANNING AND MODELING GREEN INFRASTRUCTURE FOR COMBINED SEWER OVERFLOW (CSO) CONTROL 5 (2014), https://www.epa.gov/sites/default/files/2015-10/documents/greening_cso_plans.pdf.

142. *Combined Sewer Overflow Basics*, U.S. ENV’T PROT. AGENCY, <https://www.epa.gov/npdes/combined-sewer-overflow-basics>.

of the pipes before the water reaches the river, the system backs up and water flows out of rather than into the street drains, and manholes can become geysers. Then the streets flood, and if there is enough rain, so do buildings. Most pipes—and, in older cities, just about all pipes—are, at best, of a size that would handle the rains that we experienced when they were installed (the “design storm”). In New York City, many of the sewers were built to handle 1.5 inches of rain per hour and the City wants to upgrade all sewers to about 1.75 inches per hour, which would handle what was thought of as a “five-year storm” based on rainfall data from 1903-1951.¹⁴³ But, under some new projections, a five-year storm could produce 2.15 inches per hour in the years 2040-2069.¹⁴⁴ As noted above, Hurricane Ida had a peak of 3.15 inches per hour. As Detroit Mayor Mike Duggan said after a storm overwhelmed his city’s sewer system, “[t]he infrastructure in this country was built for the climate of the 20th century. It was not built for what we have today.”¹⁴⁵

In coastal areas, storm surge and tidal flooding make all of this worse; if the sea level rises higher than the height of sewer outfalls, the water has nowhere to discharge and backs up.¹⁴⁶

Installing more or larger sewers is one approach to dealing with more intense rainfall, though it is very expensive, especially if buildings or other infrastructure have been erected above. It is sometimes impeded by protracted environmental permitting processes.¹⁴⁷

Street drains have grates to keep out large debris. If the drains are large enough and do not have grates, people are sometimes sucked in, with tragic results.¹⁴⁸ The debris accumulates outside the grates and must be removed from time to time; otherwise, the drain becomes clogged. One inspection of the New York City subway

143. N.Y.C. DEPT OF ENV’T PROT., *supra* note 34, at 8; N.Y.C. MAYOR’S OFF. OF RESILIENCY, *supra* note 40, at 5.

144. N.Y.C. MAYOR’S OFFICE OF RESILIENCY, *supra* note 40, at 5; ARTHUR T. DEGAETANO & CHRISTOPHER M. CASTELLANO, NE. REG’L CLIMATE CTR., DOWNSCALED PROJECTIONS OF EXTREME RAINFALL IN NEW YORK STATE (2015), http://ny-idf-projections.nrcc.cornell.edu/idf_tech_document.pdf.

145. Kyle Baginstose & Kevin Crowe, *Climate change brings a perfect storm of raw sewage and rainfall in cities that can least afford it*, USA TODAY, (Dec. 3, 2021, 11:28 AM), <https://www.usatoday.com/in-depth/news/investigations/2021/11/30/sewer-systems-climate-change/6201425001/>.

146. TOWARD A RAINPROOF NEW YORK CITY, *supra* note 135, at 10.

147. N.Y.C.: OFF. OF THE DEPUTY MAYOR FOR ADMIN., THE NEW NORMAL: COMBATING STORM-RELATED EXTREME WEATHER IN NEW YORK CITY 64 (2021), https://www.nyc.gov/assets/em/downloads/pdf/combatting_extreme_weather_in_nyc_report.pdf (hereinafter THE NEW NORMAL).

148. Topher Sanders, *Storm Drains Keep Swallowing People During Floods*, PROPUBLICA (Dec. 9, 2021, 6:00 AM), <https://www.propublica.org/article/storm-drains-keep-swallowing-people-during-floods>.

system found that at the targeted pace for cleaning drains—150,000 linear feet a year—it would require fifteen years to clean the entire system.¹⁴⁹ As is probably typical of cities nationwide, many of the flood control channels in Los Angeles become clogged with sediment and vegetation, impeding flows.¹⁵⁰

B. Infiltration

As discussed above, the usual way to control stormwater has involved “grey infrastructure”—pipes, concrete sewers and other hard structures. This has traditionally been required or at least encouraged by state and local governments on both public and private property.¹⁵¹ But another method is simply to let the water seep into the ground.

The problem of impervious surfaces has long been recognized. In 1789, Benjamin Franklin wrote that in his home city of Philadelphia:

[C]overing a ground plot with buildings and pavements, which carry off most of the rain and prevent its soaking into the Earth and renewing and purifying the Springs...the water of wells must gradually grow worse, and in time be unfit for use as I find has happened in all old cities.¹⁵²

Starting around 2008, the EPA increasingly included community-based green infrastructure in the combined sewer overflow plans that it negotiated with cities.¹⁵³ In 2019, Congress amended the Clean Water Act to provide that the EPA “shall promote the use of green infrastructure in, and coordinate the integration of green infrastructure into, permitting and enforcement under this Act, planning efforts, research, technical assistance, and funding guidance.”¹⁵⁴ Congress defined “green

149. Anne Barnard et al., *How Can New York City Prepare for the Next Ida? Here’s a To-Do List.*, N.Y. TIMES (Sept. 22, 2021), <https://www.nytimes.com/2021/09/20/nyregion/nyc-flooding-infrastructure.html>.

150. Raymond Zhong, *Aging Infrastructure May Create Higher Flood Risk in L.A., Study Finds*, N.Y. TIMES (Oct. 31, 2022), <https://www.nytimes.com/2022/10/31/climate/los-angeles-flood-risk.html?searchResultPosition=1>.

151. Rosenbloom, *supra* note 95.

152. Bruce Stutz, *With a Green Makeover, Philadelphia Is Tackling Its Stormwater Problem*, YALE ENV’T 360 (March 29, 2018), <https://e360.yale.edu/features/with-a-green-makeover-philadelphia-tackles-its-stormwater-problem>.

153. Arthur Smith, *Climate Change Impact on Sewer Overflow Litigation: A Spark for Sustainability and Justice*, 36 NAT. RES. & ENV’T 23 (2021).

154. 33 U.S.C.A. § 137(a). Pursuant to a 2011 Clean Water Act settlement with the EPA and the Pennsylvania state environmental agency, Philadelphia has embarked on a \$2.4

infrastructure" as "the range of measures that use plant or soil systems, permeable pavement or other permeable surfaces or substrates, stormwater harvest and reuse, or landscaping to store, infiltrate, or evapotranspire stormwater and reduce flows to sewer systems or to surface waters."¹⁵⁵

Among the methods used are rain gardens (depressed areas in the landscape, planted with grasses or flowering perennials) that collect rain water from a roof or street and allow it to soak into the ground; bluebelts (similar in function to rain gardens, but linear, larger, and often connecting wetlands); grassy highway medians; permeable pavements; green roofs; infiltration trenches; disconnecting downspouts from sewers, so that the rainwater can run across the land and be absorbed by the soil; and bioswales, which drain runoff into vegetated areas that slow and filter stormwater, allowing it to seep into the soil. To save the cities some of the expense in building sewers and to encourage these more nature-based approaches, the EPA has entered into consent decrees with about thirty cities, allowing them to meet at least part of their stormwater compliance obligation by using green infrastructure.¹⁵⁶ Other cities and developers have employed green infrastructure voluntarily, or to comply with emerging federal, state or local standards.¹⁵⁷

In a built-up city, installing green infrastructure can involve thousands of small projects. It is easier to promise them than to implement them. New York City adopted a Green Infrastructure Plan in 2010 to help comply with EPA consent orders with the state environmental department under the Clean Water Act, with the aim

billion, 25-year stormwater control program that is focused on green infrastructure. PHILADELPHIA WATER DEPARTMENT, GREEN CITY CLEAN WATERS IMPLEMENTATION AND ADAPTIVE MANAGEMENT PLAN (Dec. 1, 2011); *Green City, Clean Waters: Philadelphia's 21st Century Green Stormwater Infrastructure Program*, AM. PLANNING ASSOC. (2015), <https://www.planning.org/awards/2015/greencity.htm>.

155. *Id.* § 1362.

156. U.S. GOV'T ACCOUNTABILITY OFF., STORMWATER MANAGEMENT: EPA PILOT PROJECT TO INCREASE USE OF GREEN INFRASTRUCTURE COULD BENEFIT FROM DOCUMENTING COLLABORATIVE AGREEMENTS (2017), <https://www.gao.gov/assets/gao-17-750.pdf>; *see also* ENV'T PROT. AGENCY, CONSENT DECREES THAT INCLUDE GREEN INFRASTRUCTURE PROVISIONS (undated), <https://19january2017snapshot.epa.gov/sites/production/files/2015-10/documents/epa-green-infrastructure-supplement-1-061212-pj.pdf>.

157. ENV'T PROT. AGENCY OFF. OF WETLANDS, OCEANS & WATERSHEDS, GREEN INFRASTRUCTURE CASE STUDIES: MUNICIPAL POLICIES FOR MANAGING STORMWATER AND GREEN INFRASTRUCTURE (2010), <https://nepis.epa.gov/Exe/ZyNET.exe/P100FTEM.TXT?ZyActionD=ZyDocument&Client=EPA&Index=2006+Thru+2010&Docs=&Query=&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&IntQFieldOp=0&ExtQFieldOp=0&XmlQuery=&File=D%3A%5Czyfiles%5CIndex%20Data%5C06thru10%5CTxt%5C00000033%5CP100FTEM.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h%7C-&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/1425&Display=hpfr&DefSeekPage=x&SearchBack=ZyActionL&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=1&SeekPage=x&ZyPURL>

of reducing combined sewer overflows. The City spent about \$1 billion on about 11,500 green infrastructure projects (mostly on publicly-owned sites or rights-of-way) and took many other steps, but it was falling far behind in its obligation to reduce flows.¹⁵⁸ In May 2023 it signed a complex agreement with the state to spend another \$2 billion on a set schedule through 2045 on green infrastructure projects.¹⁵⁹ Some forms of green infrastructure, such as rain gardens, require periodic maintenance, which is not always provided.¹⁶⁰ And some states have statutes that limit the ability of municipalities to adopt their own building codes, which could limit cities' ability to mandate green infrastructure.¹⁶¹

Despite the challenges, green infrastructure can have many benefits beyond storing water and improving water quality. It reduces the urban heat island effect; improves the aesthetic appearance of streets; absorbs some air pollution; provides wildlife habitat; and creates jobs in construction and maintenance.¹⁶² Some of it provides space for recreation, or even for growing food. Green infrastructure can raise local property values, sometimes with the unfortunate effect of increasing gentrification (displacement of people who cannot afford higher rents).¹⁶³

Some green infrastructure is placed on public streets and sidewalks, but much goes on private property. The zoning or building codes of several cities require new developments and buildings undergoing major renovation to have a certain amount of permeable surface.¹⁶⁴ To induce the owners of already-developed property to allow this, in addition to reduced stormwater fees there

158. Order on Consent Decree, In the Matter of the Violations of Article 17 of the Environmental Conservation Law and Part 750, et seq., of Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (2023) (No. CO2-20230228-38), https://www.dec.ny.gov/docs/water_pdf/2023nycgiordermod.pdf; see also Laird Gallagher, *Before the Next Flood: NYC Needs More Progress Building Green Infrastructure*, CTR. FOR AN URB. FUTURE (2021), <https://nycfuture.org/research/before-the-next-flood>.

159. Sources cited *id.*

160. MARJORIE LANDA, CITY OF N.Y., OFF. OF THE COMPTROLLER, AUDIT REPORT ON THE DEPARTMENT OF ENVIRONMENTAL PROTECTION'S MAINTENANCE OF RAIN GARDENS 1-2 (2019).

161. Hillary Aidun, *Smart Surfaces, Smart Cities: Reducing Heat and Promoting Equity in Urban Areas*, SABIN CTR. FOR CLIMATE CHANGE L. (Sept. 2021), <https://climate.law.columbia.edu/sites/default/files/content/Smart%20Surfaces%20White%20Paper%20FINAL%209.10.21.pdf>.

162. Alexandra Dunn, *Siting Green Infrastructure: Legal and Policy Solutions to Alleviate Urban Poverty and Promote Healthy Communities*, 37 B.C. ENV'T AFFS. L. REV. 41 (2010); Haozhi Pan et al., *Contribution of Prioritized Urban Nature-based Solutions Allocation to Carbon Neutrality*, 13 NATURE CLIMATE CHANGE 862 (2023).

163. Rebecca H. Walker, *Engineering Gentrification: Urban Redevelopment, Sustainability policy, and Green Stormwater Infrastructure in Minneapolis*, 23 J. ENV'T POL'Y & PLAN. 646 (2021).

164. GEO. CLIMATE CTR., *Green Infrastructure Toolkit: Regulatory Tools*, <https://www.georgetownclimate.org/adaptation/toolkits/green-infrastructure-toolkit/introduction.html> (last visited Mar. 17. 2024).

can be tax abatements; grants; or development bonuses (allowing larger buildings than the zoning usually allows). Easements or covenants may be imposed to make sure the next owner does not pave over the green feature.¹⁶⁵

Urban flooding has been such a problem in China that in 2012 President Xi Jinping introduced the concept of the “Sponge City,” with nationwide standards requiring designs that absorb rainwater rather than let it flow.¹⁶⁶ The Chinese central government initiated the Sponge City Program in its 13th Five-Year Plan with subsidies to about seventy pilot cities to implement these practices. One of those cities was Zhengzhou, the capital of Henan Province in Central China. About \$8.25 billion was invested there in green infrastructure.¹⁶⁷ However, in July 2021, Zhengzhou suffered devastating losses when it was hit with what was called a one-in-one-thousand year storm event.¹⁶⁸ Other Chinese cities have had similar experiences. China’s “Sponge City” effort seems adequate for ordinary heavy rains but not for the extreme events that have been occurring more frequently.¹⁶⁹ Some cities in Germany have also adopted a “Sponge City” approach.¹⁷⁰ Similar concepts using different terminology have been employed in several other countries.¹⁷¹

One study ranked eleven cities in order of “sponginess” based on three factors: amount of blue and green space; soil type factors; and water runoff potential. The rankings (from most to least spongy): Auckland, Nairobi, Singapore, Mumbai, New York, Toronto, Montreal, Shanghai, London and Sydney.¹⁷²

A correlation to creating green infrastructure might be called “infiltration protection”—that is, where the surface is already permeable, keep it that way. The covering of natural areas with pavement and buildings is a major contributor to flooding in all

165. Justin Gundlach, *Putting Green Infrastructure on Private Property in New York City*, SABIN CTR. FOR CLIMATE CHANGE L. (2017).

166. ARUP, *Global Sponge Cities Snapshot* (2022), <https://www.arup.com/perspectives/publications/research/section/global-sponge-cities-snapshot>.

167. *Id.*

168. James Griffiths et al., *Interpretation and Application of Sponge City Guidelines in China*, 378 PHIL. TRANSACTIONS OF THE ROYAL SOC'Y A 2168 (2020); Eric Gies, *Sponge Cities Can Limit Urban Floods and Droughts*, SCI. AM. (Dec. 2018); Faith Ka Shun Chan et al., *Transformation Towards Resilient Sponge Cities in China*, 3 NATURE REV'S. 99 (2022).

169. *China's 'Sponge cities' Are Not Built for Extreme Flood Events*, BLOOMBERG NEWS (Aug. 3, 2023); Alok Gupta, *Devastating Beijing flood test China's 'sponge cities'*, CLIMATE HOME NEWS (Aug. 17, 2023), <https://www.climatechangenews.com/2023/08/17/beijing-floods-airport-shut-down/>.

170. *Germany's Sponge Cities to Tackle Heat and Flooding*, OECD (undated), <https://www.oecd.org/climate-action/ipac/practices/germany-s-sponge-cities-to-tackle-heat-and-flooding-7b6caa58/> (last visited Mar. 17, 2024).

171. Leah Hamilton, *Urbanism 101: What is a Sponge City?*, THE URBANIST (Feb. 8, 2023), <https://www.theurbanist.org/2023/02/08/urbanism-101-what-is-a-sponge-city/>.

172. ARUP, *supra* note 166.

urbanized areas. Many states and some cities restrict development in wetlands, floodplains, and other sensitive areas; flood control is only one of the many reasons for these controls.¹⁷³ The Army Corps of Engineers, working with the EPA, has an important regulatory program (called the Section 404 program, after the relevant section of the Clean Water Act) to restrict dredging and filling in wetlands and other waters,¹⁷⁴ though in 2023 the Supreme Court severely limited its coverage.¹⁷⁵ There is a large legal literature concerning this program, so it will not be discussed further here.¹⁷⁶

C. Storage

Because it can take time for stormwater to soak into the ground or make its way through pipes, some of the water in big storms must be stored temporarily. This can be done in holding tanks, natural or artificial underground caverns, and other hard facilities, some as small as rain barrels.¹⁷⁷ More on the green infrastructure side, water can be stored in retention ponds and in sunken athletic fields, playgrounds, and other areas that people use on dry days but are designed to flood during heavy rains. Old golf courses provide a prime opportunity; if they are in natural depressions or are dug out, they can become excellent reservoirs for water storage.¹⁷⁸ Green roofs store water for a time, and in hot weather they help cool the buildings on which they sit.¹⁷⁹ Wetlands form natural storage and seepage areas.

The largest water storage facility in the United States (not counting lakes behind dams) is the Chicago area's Tunnel and Reservoir Plan (TARP), known as Big Tunnel.¹⁸⁰ It actually includes four tunnel systems totaling 110 miles of tunnels up to thirty-three

173. MITIGATION MATTERS: POLICY SOLUTIONS TO REDUCE LOCAL FLOOD RISK, PEW CHARITABLE TRS. 4-5 (2019).

174. Clean Water Act § 404, 33 U.S.C. §1344.

175. *Sackett v. EPA*, 598 U.S. 21 (2023).

176. E.g., Monika U. Ehrman & Robin Kundis Craig, *The Supreme Court's Wetland Saga Continues*, REGUL. REV. (July 13, 2023), <https://www.theregreview.org/2023/07/13/ehrman-craig-the-supreme-courts-wetland-saga-continues/>.

177. Some states have design standards for stormwater detention facilities, commonly expressed as an allowable release rate for a specified return interval event. WINTERS, *supra* note 68, at 45-47.

178. Dylan Baddour, *Reclaiming Golf Courses Could Help Houston Fight the Next Hurricane Harvey*, WASH. POST (Nov. 27, 2017); Aileen Kwun, *The Suburban Golf Course, Reconsidered for the Age of Climate Change*, FAST CO. (Feb. 27, 2018); Rick Jervis, *How this Small Houston community Survived Hurricane Harvey When Other Parts Didn't*, USA TODAY (Jan. 19, 2018).

179. LOOK UP TO MAKE ROOM FOR A GREENER NYC, THE NATURE CONSERVANCY 1 (2019), https://www.nature.org/content/dam/tnc/nature/en/documents/NYC_Green_Roofs_Summary.pdf.

180. *Tunnel and Reservoir Plan*, METRO. WATER RECLAMATION DIST. OF GREATER CHI., <https://mwrd.org/what-we-do/tunnel-and-reservoir-plan-tarp> (last visited Apr. 29, 2024).

feet in diameter and up to 300 feet underground. They capture combined sewage and stormwater and convey them to three reservoirs in the suburbs, and then send them to what has been called the world's largest wastewater treatment plant¹⁸¹ as capacity becomes available. Construction began in 1975 to help comply with the new Clean Water Act and keep untreated sewage out of Lake Michigan, which is the area's source of drinking water, and to control flooding.¹⁸² A powerful local congressman was able to obtain substantial federal financial assistance to help build the project.¹⁸³ TARP has been very successful in improving water quality in the lake, and several other cities are imitating it, including Milwaukee, St. Louis, Washington, D.C., London and Guangzhou. However, especially with the increase in extreme precipitation, TARP is not big enough to prevent urban flooding; after the heaviest rains it still fills up faster than it can drain and the sewers back up.¹⁸⁴ The agency that runs the area's wastewater system has signed a consent decree with the EPA committing to many green infrastructure projects.¹⁸⁵

Tokyo also has an enormous underground flood protection system rivalling the size of TARP—its central cavern has been called a “floodwater cathedral”¹⁸⁶—and it, too, may be insufficient in view of climate change.¹⁸⁷ There appears to be growing international recognition that while large hard infrastructure projects such as

181. *Stickney WRP*, METRO. WATER RECLAMATION DIST. OF GREATER CHI., <https://legacy.mwrd.org/irj/portal/anonymous/stickney#:~:text=The%20Stickney%20Water%20Reclamation%20Plant,Chicago%20and%2046%20suburban%20communities> (last visited Mar. 6, 2024).

182. *Tunnel and Reservoir Plan*, *supra* note 180.

183. See, e.g., Henry Grabar, *Tunnel Vision*, SLATE (Jan. 2, 2019, 5:50 AM), <https://slate.com/business/2019/01/chicagos-deep-tunnel-is-it-the-solution-to-urban-flooding-or-a-cautionary-tale.html>; see JOSEPH D. KEARNEY & THOMAS W. MERRILL, *LAKEFRONT: PUBLIC TRUST AND PRIVATE RIGHTS IN CHICAGO* 288 (2021).

184. Joe Barrett, *Chicago Is Spending \$3.8 Billion to Fight Flooding. It Might Not Be Enough*, WALL ST. J. (Aug. 30, 2023, 8:00 AM), <https://www.wsj.com/us-news/climate-environment/chicago-is-spending-3-8-billion-to-fight-flooding-it-might-not-be-enough-f9a30bbd>.

185. *Tunnel and Reservoir Plan*, *supra* note 182; Stanley A. Changnon, *Stormwater Management for a Record Rainstorm in Chicago*, 146 J. CONTEMP. WATER RSCH. & EDUC. 103 (2010); Grabar, *supra* note 182; *Costly Deep Tunnel Flooding Project Struggles to Handle Severe Storms Amid Climate Change*, EARTH INFORMANT (July 20, 2023), <https://www.earthinformant.com/post/costly-deep-tunnel-flooding-project-struggles-to-handle-severe-storms-amid-climate-change>; KEARNEY & MERRILL, *supra* note 183, at 287-89.

186. Diego Arguedas Ortiz, *The Underground Cathedral Protecting Tokyo from Floods*, BBC (Nov. 29, 2018), <https://www.bbc.com/future/article/20181129-the-underground-cathedral-protecting-tokyo-from-floods>.

187. Elisa Jiménez Alonso, *Tokyo's Massive Flood Protection Facility Might Not be "Enough" Due to Climate Change*, PREVENTIONWEB (Mar. 29, 2018), <https://www.preventionweb.net/news/tokyos-massive-flood-protection-facility-might-not-be-enough-due-climate-change>; Hiroko Tabuchi, *Tokyo Is Preparing for Floods 'Beyond Anything We've Seen'*, N.Y. TIMES (Oct. 6, 2017), <https://www.nytimes.com/2017/10/06/climate/tokyo-floods.html>.

those in Chicago and Tokyo can make a substantial contribution to reducing urban flooding, green infrastructure is also needed.¹⁸⁸

D. Defense Measures

With rising seas and increasingly intense coastal storms, much attention is being devoted to building sea walls and even more expensive tidal gates such as, most famously, the Thames Barrier in London and the MOSE barrier in Venice. However, those are designed to defend against water coming from the sea, not the sky, and are beyond the scope of this article. Levees—artificial embankments or other linear structures—are mostly built to hold back water from rivers and seas. More relevant to pluvial flooding are protections for buildings. Rather than moving the stormwater to receiving waters like rivers and lakes (through grey infrastructure) or allowing it to infiltrate into the ground (through green infrastructure), these methods try to keep stormwater out of the place to be protected.

Every year, many buildings are damaged or destroyed by floods or storms. Building codes are the principal legal mechanism to make sure they are soundly designed and built. These are creatures of state law; there are no federal building codes except for federal buildings and manufactured homes (trailers).¹⁸⁹ Some states have codes that apply to virtually all kinds of buildings (residential, commercial, schools, and others); others have codes only for certain kinds of buildings, or none at all.¹⁹⁰ Some states allow cities to adopt their own codes, which may be weaker or stronger than the state codes.¹⁹¹

As with flood maps, most building codes are backward-looking. They assume a continuation of the precipitation rates, temperatures, and other conditions in the historical record, rather than what a changing climate will bring.¹⁹² However, the 2021 update to an American Society of Civil Engineers standard for

188. Faith Ka Shun Chan et al., *Comparison of Sustainable Flood Risk Management by Four Countries – the United Kingdom, the Netherlands, the United States, and Japan – and the Implications for Asian Coastal Megacities*, 22 NAT. HAZARDS & EARTH SYST. SCI. 2567 (2022).

189. *How Building Codes Work in the US*, CONSTR. PHYSICS, <https://www.construction-physics.com/p/how-building-codes-work-in-the-us>.

190. *Id.*

191. *Id.*

192. U.S. GOV'T ACCOUNTABILITY OFF., GAO-17-3, CLIMATE CHANGE: IMPROVED FEDERAL COORDINATION COULD FACILITATE USE OF FORWARD-LOOKING CLIMATE INFORMATION IN DESIGN STANDARDS, BUILDING CODES, AND CERTIFICATIONS (2016), <https://www.gao.gov/assets/d173.pdf>; Diane P. Horn & Erica A. Lee, CONG. RSCH. SERV., R47612, BUILDING RESILIENCE: FEMA'S BUILDING CODES POLICIES AND CONSIDERATIONS FOR CONGRESS 6-7 (2023), <https://crsreports.congress.gov/product/pdf/R/R47612>.

minimum design loads for buildings and other structures increased the covered flood hazard area from the 100-year flood plain to the 500-year flood plain for certain sensitive uses.¹⁹³

When states or cities adopt their codes, almost all of them start with standard codes developed by others, and adopt them, fully or with modifications, as their own. The dominant drafter of these codes in the United States is the International Code Council (ICC), which has developed more than a dozen codes and standards covering buildings, fire, plumbing, energy conservation, and other subjects. It reviews and updates the codes every three years.¹⁹⁴ The ICC is a nonprofit corporation based in Washington, D.C., with over 700 staff members and 405 chapters worldwide.¹⁹⁵ It has an elaborate governance process, but the National Association of Home Builders, the main trade association and lobbying arm of the home construction industry, plays a key role. Controversy has arisen as the ICC has quietly modified its processes to increase the power of the National Association of Home Builders and reduce that of local governments in setting standards, including those relevant to climate.¹⁹⁶

The National Association of Home Builders and many of its chapters have often fought standards that would make construction more expensive, including by imposing greater energy efficiency and climate resilience standards. This association has also pushed back against EPA stormwater regulations.¹⁹⁷ The stakes are high for the

193. AM. SOC'Y OF CIV. ENGR'S, SUPPLEMENT 2 FOR MINIMUM DESIGN LOADS AND ASSOCIATED CRITERIA FOR BUILDINGS AND OTHER STRUCTURES S2-42 (2021), <https://ascelibrary.org/doi/10.1061/9780784415788.sup2>.

194. *International Codes and Standards*, INT'L CODE COUNCIL, <https://global.iccsafe.org/international-codes-and-standards/#:~:text=The%20core%20work%20of%20the%20International%20Code%20Council,every%20three%20years%20through%20an%20open%2C%20consensus-based%20process>. (last visited Apr. 29, 2024).

195. *Who We Are*, INT'L CODE COUNCIL, <https://www.iccsafe.org/about/who-we-are/> (last visited Mar. 6, 2024).

196. Alexander C. Kaufman, *After Championing Greener Building Codes, Local Governments Lose Right to Vote*, HUFFINGTON POST (Mar. 4, 2021), https://www.huffpost.com/entry/building-codes-international-code-council_n_603fd6b4c5b682971504df8e; Alexander C. Kaufman, *With Time Running Out to Cut Carbon From Buildings, Industry Just Tightened Its Grip*, HUFFINGTON POST (July 1, 2021), https://www.huffpost.com/entry/building-codes-climate-change_n_60de150fe4b0ddef8b0e2a62; Emma Foehringer Merchant, *The Fight to Change US Building Codes*, INSIDE CLIMATE NEWS (Aug. 2, 2021), <https://insideclimatenews.org/news/02082021/building-codes-california-climate-change/>; Justin Gillis, *What Happens if Home Builders Get Their Way?*, N.Y. TIMES, January 25, 2021, at A19; Christopher Flavelle, *Secret Deal Helped Housing Industry Stop Tougher Rules on Climate Change*, N.Y. TIMES (Oct. 26, 2019), <https://www.nytimes.com/2019/10/26/climate/building-codes-secret-deal.html>; Christopher Flavelle, *Inside the Lobby Against Tougher Homes*, BLOOMBERG (July 6, 2016), <https://www.bloomberg.com/view/articles/2016-07-06/inside-the-lobby-against-tougher-homes>.

197. Letter from Ty Asfaw, National Association of Home Builders, to EPA, Re Draft NPDES General Permits for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems in Massachusetts North Coastal Watersheds (March 31, 2010), <https://www3.epa.gov/region1/npdes/stormwater/ma/masms4comments/NAHBCComments.pdf>.

builders. In 2019, St. Louis County, Missouri, which had been using the 2009 version of the ICC codes, adopted the 2018 version, with its stronger energy efficiency rules.¹⁹⁸ This so outraged the local builders' association that it contributed \$250,000—a very large amount for such a race—to the primary election campaign of the county executive's opponent.¹⁹⁹ The Sierra Club supported the incumbent; he won.²⁰⁰ Lobbying by the builders, together with anti-regulatory sentiment, is a major reason that a few states have weakened their building codes despite facing stronger storms.²⁰¹

Imposing local building codes can make a big difference. Nashville, Tennessee, has one of the nation's most restrictive codes, requiring the ground floor of new houses to be at least four feet above the expected height of a major flood.²⁰² However, many nearby towns lack any building codes, and those places suffered catastrophic flooding in August 2021, leaving at least twenty people dead.²⁰³ In Florida, the state code requires more wind-resistant features for buildings in the southern part of the state, which was thought to be more prone to hurricanes, than in the north. However, in 2018, a Category 5 storm, Hurricane Michael, hit the Florida Panhandle (in the northern part of the state) and devastated several towns where weaker standards were in place.²⁰⁴ Some houses there

198. Jacob Barker, *After St. Louis County Updated Building Codes, Home Builders Put Big Money Behind Page, Dunaway Opponents*, ST. LOUIS POST-DISPATCH (July 5, 2020), https://www.stltoday.com/news/local/metro/after-st-louis-county-updated-building-codes-home-builders-put-big-money-behind-page-dunaway/article_427049f6-d0fe-56bb-80db-ba5bc9d279d0.html.

199. *Id.*

200. *Id.*; Jeremy Kohler, *Sam Page Wins Democratic Primary for St. Louis County Executive*, ST. LOUIS POST-DISPATCH (Aug. 5, 2020), https://www.stltoday.com/news/local/government-politics/sam-page-wins-democratic-primary-for-st-louis-county-executive/article_0a3d7ecd-7465-5927-86a5-4d000bcacf5b6.html.

201. Christopher Flavelle, *As Storms Get Stronger, Building Codes Are Getting Weaker*, BLOOMBERG (Mar. 19, 2018, 4:00 AM), <https://www.bloomberg.com/politics/articles/2018-03-19/storm-prone-states-ease-off-building-codes-as-climate-risk-grows>; Cameron Smith & William Booher, *When it Comes to Louisiana Floods, how much does a Foot Really Matter?*, NOLA.COM (Feb. 14, 2017), https://www.nola.com/opinions/guest-column-when-it-comes-to-louisiana-floods-how-much-does-a-foot-really-matter/article_a0ea1d2a-9498-5a36-a923-cd0829067643.html; David Boraks, *North Carolina Lawmakers Override Veto of Bill that Delays Building Code Updates*, WUNC 91.5 (Aug. 17, 2023, 5:44 PM), [https://www.wunc.org/2023-08-17/north-carolina-lawmakers-override-veto-of-bill-that-delays-building-code-updates; see also INS. INST. FOR BUS. & HOME SAFETY, RATING THE STATES 2021: HURRICANE COAST 7 \(2021\).](https://www.wunc.org/2023-08-17/north-carolina-lawmakers-override-veto-of-bill-that-delays-building-code-updates; see also INS. INST. FOR BUS. & HOME SAFETY, RATING THE STATES 2021: HURRICANE COAST 7 (2021).)

202. Christopher Flavelle, *How Government Decisions Left Tennessee Exposed to Deadly Flooding*, N.Y. TIMES (Aug. 26, 2021), <https://www.nytimes.com/2021/08/26/climate/tennessee-flood-damage-impact.html>.

203. *Id.*

204. Daniel Cusick, *Michael Roared through Loophole in Vaunted Building Code*, E&E NEWS (Oct. 19, 2018, 7:36 AM), <https://subscriber.politicopro.com/article/eenews/2018/10/19/michael-roared-through-loophole-in-vaunted-building-code-037044>; Andres Viglucci et al., *Florida's Building Code is Tough, but Michael was Tougher. Is it Time for a Rewrite?*, MIA. HERALD (Oct. 13, 2018, 7:15 AM), https://www.miamiherald.com/news/state/florida/article_219862625.html.

survived amid their toppled neighbors because they were erected by Habitat for Humanity, which goes beyond code with more secure ties of the roofs to the walls, thicker lumber, windstorm plywood and metal roofs.²⁰⁵

Houses can be constructed to withstand most hurricane winds, floods and wildfires, but few are built that way where it is not legally required.²⁰⁶ Where states or localities have imposed especially strong standards, they have tended to withstand legal challenges.²⁰⁷ In Connecticut, a couple whose home had been destroyed by Hurricane Sandy sought to erect a new house that would be elevated, and thus better able to withstand flooding.²⁰⁸ The town zoning board denied a variance based on aesthetic grounds.²⁰⁹ The court reversed the denial, finding that the increased height would reduce the hazard and warranted a variance.²¹⁰

Strong codes make buildings much safer and are highly cost effective. The National Institute of Building Sciences has calculated that the benefit-cost ratio for adopting the ICC's 2018 codes versus codes represented by 1990-era design was eleven-to-one.²¹¹ As noted, not all are happy with the ICC process, but its latest codes are much better than those that came before. FEMA advocates for strong building codes, and it calculated in 2020 that the ICC codes save a total of \$1.6 billion in losses per year nationwide, and that number could grow above \$4 billion by 2040 depending on how many structures are built to these codes.²¹² There are national standards for mobile homes (since they are manufactured in different places

205. Patricia Sullivan et al., *Houses Intact After Hurricane Michael were Often Saved by Low-Cost Reinforcements*, WASH. POST (Oct. 17, 2018, 8:19 PM), https://www.washingtonpost.com/politics/panhandle-houses-intact-after-michael-were-often-saved-by-low-cost-reinforcements/2018/10/17/d3ca97c0-d152-11e8-b2d2-f397227b43f0_story.html.

206. Christopher Flavelle, *Hurricane-Proof Homes Are Real. Why Isn't Anyone Buying Them?*, BLOOMBERG (June 20, 2018, 4:00 AM), <https://www.bloomberg.com/news/features/2018-06-20/hurricane-proof-homes-are-real-why-isn-t-anyone-buying-them?embedded-checkout=true>; Patricia Mazzei, *Among the Ruins of Mexico Beach Stands One House, Built for the Big One*, N.Y. TIMES (Oct. 14, 2018), <https://www.nytimes.com/2018/10/14/us/hurricane-michael-florida-mexico-beach-house.html>.

207. Lindstrom v. Cal. Coastal Comm'n, 352 Cal. Rptr. 3d 817 (Cal. Ct. App. 2019); Martin v. Cal. Coastal Comm'n, 281 Cal. Rptr. 3d 343 (Cal. Ct. App. 2021).

208. *Id.*

209. *Id.*

210. Turek v. Zoning Bd. of Appeals of Milford, 66 Conn. L. Rptr. 353 (Conn. Sup. Ct. 2018).

211. NAT'L INST. OF BLDG. SCIS., NATURAL HAZARD MITIGATION SAVES: 2019 REPORT 393 (2019); *see* Kevin M. Simmons et al., *Economic Effectiveness of Implementing a Statewide Building Code: The Case of Florida*, 94 LAND ECON. 155 (2018).

212. FED. EMERGENCY MGMT. AGENCY, BUILDING CODES SAVE: A NATIONWIDE SURVEY 7-19 (2020); *see also* Thomas Frank, *Harvey Spared Homes Built to New Codes, Flood Maps*, E&E NEWS (Apr. 5, 2019, 7:12 AM), <https://subscriber.politicopro.com/article/eenews/1060143891>; Ralph Vartabedian & Ben Welsh, *How Houston's Newest Homes Survived Hurricane Harvey*, L.A. TIMES (Nov. 8, 2017), <https://www.latimes.com/projects/la-na-houston-harvey-home-survivors/>.

than where they are used).²¹³ These national standards were imposed after Hurricane Andrew destroyed 90% of the mobile homes in parts of Florida in 1992.²¹⁴ The homes built to those standards have proven themselves much more resilient to storms than older units.²¹⁵

In a 2020 poll of a sample of 999 American adults, 84% of the respondents favored requiring new building codes to minimize flood damage, and 57% supported prohibiting development in flood-prone areas.²¹⁶ Several cities have adopted forward-looking building or zoning codes that are stronger than the ICC's with respect to climate resilience. These include New York City,²¹⁷ San Francisco,²¹⁸ and Boston.²¹⁹ Most of these apply only to buildings owned or financed by the city. However, in 2020, New Jersey Governor Phil Murphy issued an executive order instructing the state environmental department to draft new regulations that would require private developers to take into account the impact of climate change, including sea level rise.²²⁰ The state finalized the rules in June 2023 after delays caused by lobbying by business groups.²²¹

213. National Manufactured Housing Construction and Safety Standards Act of 1974, 42 U.S.C. §§ 5401-5426; 24 C.F.R. §§ 3280, 3282, 3284-86, 3288, 3800 (2024).

214. Danielle Paquette, *Florida has 828,000 Mobile Homes. Less than a Third were Built to Survive a Hurricane*, WASH. POST, (Sep. 12, 2017, 11:51 AM), <https://www.washingtonpost.com/news/wonk/wp/2017/09/12/florida-has-828000-mobile-homes-only-half-are-insured/>; Cornell et al., *1992 Hurricane Andrew and Housing Sensitivity in South Florida*, INTEGRATE, <https://www.e-education.psu.edu/earth107/node/1421> (last visited Apr. 17, 2024).

215. Joseph B. Treaster & Henry Fountain, *Considered Vulnerable, Mobile Homes Are Battered but Largely Intact*, N.Y. TIMES (Sep. 14, 2017), <https://www.nytimes.com/2017/09/14/us/mobile-homes-florida-irma.html>.

216. BO MACINNIS & JON A. KROSNICK, CLIMATE INSIGHTS 2020: SURVEYING AMERICAN PUBLIC OPINION ON CLIMATE CHANGE AND THE ENVIRONMENT – REPORT: NATURAL DISASTERS 8 (2020), https://media.rff.org/documents/Climate_Insights_Overall_Trends_Final_RCF AejQ.pdf.

217. N.Y.C. Council Int. 2092-2020 (2021) (enacted); Press Release, Office of the Mayor, New York City, Recovery For All of Us: New York City Adopts new Zoning Rules to Protect Coastal Areas From Climate Change (May 12, 2021), <https://www.nyc.gov/office-of-the-mayor/news/356-21/recovery-all-us-new-york-city-adopts-new-zoning-rules-protect-coastal-areas-climate>; N.Y.C. MAYOR'S OFF. OF RECOVERY & RESILIENCE, CLIMATE RESILIENCY DESIGN GUIDELINES, VERSION 4.1 (2022), <https://www.nyc.gov/assets/sustainability/downloads/pdf/publications/CRDG-4-1-May-2022.pdf>.

218. See CITY & CNTY. OF SAN FRANCISCO, GUIDANCE FOR INCORPORATING SEA LEVEL RISE INTO CAPITAL PLANNING IN SAN FRANCISCO: ASSESSING VULNERABILITY AND RISK TO SUPPORT ADAPTATION (2015), <https://onesanfrancisco.org/sites/default/files/inline-files/Guidance-for-Incorporating-Sea-Level-Rise-into-Capital-Planning1.pdf>.

219. See Tom Acitelli, *New Boston Development Rules Aim to Mitigate Climate Change Effects*, CURBED BOST. (June 15, 2018, 6:38 AM), <https://boston.curbed.com/boston-development/2018/6/15/17467382/boston-development-rules-climate-change>.

220. Tracey Tully, *Builders Must Consider Climate Change and Rising Seas, New Jersey Says*, N.Y. TIMES (Jan. 28, 2020), <https://www.proquest.com/docview/2346152559?accountid=4840&sourcetype=Newspapers>.

221. Jon Hurdle, *NJ Uses Climate Projections to Set New Restrictions on Developers*, NJ SPOTLIGHT NEWS (June 7, 2023), <https://www.njspotlightnews.org/2023/06/nj-uses-climate-projections-to-set-new-restrictions-on-developers>.

Under the Obama administration, several federal agencies took steps to advance building resilience, but fell short of imposing binding regulations on purely private activities not receiving federal funding.²²² In January 2015, President Obama issued an executive order establishing a federal flood risk management standard for federally funded projects;²²³ President Trump revoked that order in August 2017;²²⁴ and President Biden canceled the revocation in January 2021.²²⁵ Several FEMA programs require adherence to a variety of building code standards.²²⁶

To advocate for action in the new administration, shortly before President Biden was inaugurated, several groups petitioned the federal government to call for more stringent building standards for homes and infrastructure along rivers and coasts.²²⁷ That has not happened, but in 2023 the Congressional Research Service noted that Congress has several options: it could consider requiring federally funded projects to rebuild to standards resilient to “future conditions,” whenever possible, and could direct FEMA to incorporate estimations of future conditions into the agency’s definition of resilience so that recipients of FEMA funding may use that money to build to codes and standards reflecting anticipated conditions on a certain future date.²²⁸ They noted that “Congress could also incentivize, rather than require, such mitigation measures by authorizing higher federal cost shares, discounts on insurance premiums, tax credits, or access to additional grants or loans”²²⁹.

The nonprofit U.S. Green Building Council, which maintains the influential Leadership in Energy and Environmental Design (LEED) standards, has a Climate Resilience Screening Tool.²³⁰

development-climate-projections-restrictions-flood-levels-new-rule/. The rule itself is available at N.J. ADMIN. CODE §7:13 (2023), <https://dep.nj.gov/wp-content/uploads/rules/adoptions/adopt-20230717a.pdf>.

222. *Fact Sheet: Obama Administration Announces Public and Private Sector Efforts to Increase Community Resilience through Building Codes and Standards*, THE WHITE HOUSE (May 10, 2016), <https://obamawhitehouse.archives.gov/the-press-office/2016/05/10/fact-sheet-obama-administration-announces-public-and-private-sector>.

223. Exec. Order No. 13,690, 80 Fed. Reg. 6425 (Jan. 30, 2015).

224. Exec. Order No. 13,807, 82 Fed. Reg. 40463 (Aug. 15, 2017).

225. Exec. Order No. 13,990, 86 Fed. Reg. 8637 (Jan. 20, 2021).

226. Horn & Lee, *supra* note 192, at 16-17.

227. Christopher Flavelle, *Early Biden Climate Test: Groups Demand Tougher Rules on Building*, N.Y. TIMES (January 6, 2021), <https://www.nytimes.com/2021/01/06/climate/flood-zone-building-restrictions.html>.

228. Horn & Lee, *supra* note 192, at 33-34.

229. *Id.* at 33.

230. *LEED Climate Resilience Screening Tool for LEED v4 Projects*, U.S. GREEN BLDG. COUNCIL, <https://www.usgbc.org/resources/leed-climate-resilience-screening-tool-leed-v4-projects> (last visited Feb. 17, 2024); U.S. GREEN BLDG. COUNCIL, *MEASURING RESILIENCE: A GUIDE TO MEASURING COMMUNITY RESILIENCE IN LEED v4.1 CITIES AND COMMUNITIES: EXISTING* (2019), <https://www.usgbc.org/sites/default/files/Measuring-Resilience-Guide.pdf>.

Among the factors to be considered in resilience to flooding are back-up power supplies and location of equipment above the 500-year floodplain, or sufficient protections if below that level.²³¹

Not all flood hazards in buildings are due to inadequate building codes. When Hurricane Ida hit New York in 2021, eleven people drowned in basement apartments, including a two-year-old boy and an 86-year-old woman.²³² The apartments were illegal and were not in a FEMA special flood hazard area. More rapid communication of evacuation warnings might have saved some of these lives, but the tragedy was fundamentally about a crisis in affordable housing. At least 100,000 New Yorkers live in 50,000 or more illegal basement apartments.²³³ Many of them are immigrants who cannot afford anything better and, as tenants of illegal apartments, have few legal rights. These units, often without windows or other ventilation, are an important part of the city's housing stock. This raises social issues beyond the scope of this article, but it should be noted.²³⁴

When a building is first erected, adding certain features to make it more resilient can often be done at modest cost, and the owners or purchasers will often be willing and able to pay. Retrofitting an existing building is another matter entirely. That has been a particularly acute issue for California ever since the San Francisco earthquake of 1906, but satisfactory remedies have been a long time coming. The experience with earthquake protection illustrates some of the possibilities and challenges.

In 1977 Congress passed the National Earthquake Hazards Reduction Act, creating an interagency program to develop nationally applicable seismic design guidelines for new buildings.²³⁵ The ICC and the National Fire Protection Association have issued their own codes.²³⁶ San Francisco, Los Angeles and some other

231. *Design for Enhanced Resilience*, U.S. GREEN BLDG. COUNCIL, <https://www.usgbc.org/credits/enhancedresilience> (last visited Feb. 17, 2024).

232. Thomas Frank, *11 People Drowned in 'Minimal' Flood Zone During Ida*, E&E NEWS (Oct. 6, 2021).

233. THE NEW NORMAL, *supra* note 147 at 47.

234. See Sateesh Nori, *The Ground Beneath Our Feet: Basement Apartments, Climate Change, and Housing Inequality*, 30 N.Y.U. ENV'T L.J. 325 (2022); Stephanie Lai et al., *Life and Death Underground: N.Y. Immigrants Perish in Flooded Basements*, WASH. POST (Sept. 4, 2021), https://www.washingtonpost.com/politics/hurricane-ida-new-york-floods/2021/09/04/b661e9da-0ce7-11ec-a6dd-296ba7fb2dce_story.html; Venessa Wong, *The Housing Crisis led Them to Basement Apartments. Climate Change Flooded Them Out*, BUZZFEED NEWS (Mar. 4, 2022), <https://www.buzzfeednews.com/article/venessawong/basement-apartment-flooding-housing-climate-change>.

235. CONG. RSCH. SERV., R43141, THE NATIONAL EARTHQUAKE HAZARDS REDUCTION PROGRAM (NEHRP): ISSUES IN BRIEF (2018), <https://crsreports.congress.gov/product/pdf/R/R43141/15>.

236. See *Earthquake Safety and Recovery*, INT'L CODE COUNCIL, <https://www.iccsafe.org/advocacy/safety-toolkits/earthquake-safety-and-resources/> (last visited Apr. 29, 2024); Shawn Mahoney, *Introduction to Seismic Protection for Sprinkler*

California cities have passed laws requiring the retrofitting of vulnerable buildings, but allowing generous amounts of time to comply (in some cases up to 25 years).²³⁷ The courts have upheld the mandate to retrofit buildings, finding that the “fact that a building was constructed in accordance with all existing statutes does not immunize it from subsequent abatement as a public nuisance.”²³⁸ Building codes are the minimum requirements, but they are not necessarily enough.

In San Francisco, buildings that have missed their retrofit deadlines must be posted with large signs that say (in red lettering in English, Spanish and Chinese) “EARTHQUAKE WARNING!,” with the legend: “This Building is in Violation of the Requirements of the San Francisco Building Code Regarding Earthquake Safety.”²³⁹ In Los Angeles, landlords and tenants equally share the costs, but the maximum rent increase is capped at \$38 per month.²⁴⁰ Landlords who fail to carry out the required retrofits have been held liable if a tenant is injured or killed in an earthquake.²⁴¹

The state established the California Earthquake Authority to provide affordable earthquake insurance. Buildings that have been retrofitted get a premium discount.²⁴² The state also has an Earthquake Bolt + Brace program to provide homeowners up to \$3,000 toward a residential seismic retrofit.²⁴³

One can imagine a system of standard codes, warning signs, subsidies, and insurance for building retrofits for flooding, similar to those for earthquakes.

Some relatively small retrofits can enhance the ability of buildings and infrastructure to defend against flooding. These

Systems, NAT'L FIRE PROT. ASSOC. (Mar. 19, 2021), <https://www.iccsafe.org/advocacy/safety-toolkits/earthquake-safety-and-resources/>.

237. See, e.g., *Los Angeles, SEISMIC ORDINANCES*: WISS, JANNEY, ELSTNER ASSOC., <https://www.seismicordinances.com/non-ductile-concrete-structures/los-angeles> (last visited Apr. 29, 2024); *San Francisco, SEISMIC ORDINANCES*: WISS, JANNEY, ELSTNER ASSOC., <https://www.seismicordinances.com/wood-frame-soft-story-structures/san-francisco> (last visited Apr. 29, 2024).

238. *City of Bakersfield v. Miller*, 64 Cal.2d 93, 101 (1966).

239. Rong-Gong Lin II et al., *As San Francisco Rents Soar, Tenants still Willing to Pay for Earthquake Safety*”, L.A. TIMES (Oct. 6, 2015), <https://www.latimes.com/local/lanow/la-me-in-quake-san-francisco-20151006-htmlstory.html>.

240. Rosanna Xi, *L.A. Landlords and Tenants will Share Earthquake Retrofit Costs Under Deal Approved by City Council*, L.A. TIMES (Jan. 13, 2006), <https://www.latimes.com/local/lanow/la-me-in-retrofit-20160113-story.html#:~:text=After%20many%20housing%20studies%20and,increase%20of%20%2438%20per%20month>.

241. *Myrick v. Mastagni*, 185 Cal. App. 4th 1082 (2010).

242. Press Release, Cal. Earthquake Auth., *Earthquake Brace + Bolt Grants Now Available To More Eligible California Homeowners* (Jan. 10, 2024), <https://www.earthquakeauthority.com/press-room/press-releases/2024/earthquake-brace-bolt-grants-now-available-to-more-eligible-california-homeowners>.

243. *What is EBB?*, EARTHQUAKE BRACE + BOLT, <https://www.earthquakebracebolt.com/What-is-EBB> (last visited Feb. 17, 2024).

include such items as closing off entrances through which water can enter, installing permanent or removable flood shields, and adding household backwater valves to prevent sewer backups.²⁴⁴ Several companies sell removable flood barriers that can be placed in front of doors or loading docks, or around entire buildings; a search on Google or Amazon for “removable flood barrier” yields advertisements for a wide variety of these devices. As one very low-tech measure, New York City offers sandbags to residents in advance of major storms.²⁴⁵

E. Accommodation

Accommodation measures allow the water to enter in a way that does little or no damage. Typical measures include elevating buildings on stilts or otherwise; putting electrical equipment, furnaces, air conditioning units, and the like at higher levels in buildings; and devoting the ground level to vehicles that can be moved away in the event of an oncoming storm.²⁴⁶

These measures are typically used to guard against coastal flooding. Sea level rise can be predicted, and storm surge can at least be foreseen, and so some new beach houses, for example, are designed to accommodate water intrusions at their lower level. Property owners rarely anticipate riverine or pluvial flooding, and building designs rarely reflect such accommodations.

FEMA rules now require that if a home has been substantially damaged (whether by a flood or otherwise), any reconstruction must include elevating the home so that its lowest floor (which includes basements but does not count parking or open storage) is at or above the base flood elevation, generally meaning the expected level of a flood that has at least a one percent chance of occurring a year, as

244. FED. EMERGENCY MGMT. AGENCY, REDUCING FLOOD RISK TO RESIDENTIAL BUILDINGS THAT CANNOT BE ELEVATED (2015), https://www.fema.gov/sites/default/files/2020-07/fema_P1037_reducing_flood_risk_residential_buildings_cannot_be_elevated_2015.pdf; N.Y.C. DEP'T OF CITY PLAN., COASTAL CLIMATE RESILIENCY: RETROFITTING BUILDINGS FOR FLOOD RISK (2014), https://www.nyc.gov/assets/planning/download/pdf/plans-studies/retrofitting-buildings/retrofitting_complete.pdf.

245. THE NEW NORMAL, *supra* note 147 at 6-7, 17.

246. See, e.g., JOSEPH W. LSTIBUREK, BLDG. SCI. CORP., DESIGNING FOR FLOODS (2022), https://buildingscience.com/sites/default/files/document/bsi-128_designing_for_floods_0.pdf; Ben Gibran, *Why We Should Build Cities on Stilts*, MEDIUM (June 29, 2020), <https://medium.com/environmental-intelligence/why-we-should-build-cities-on-stilts-cd5bc7b1e6e6>; Isabella O'Malley, *Climate change is transforming architecture: Think houses on stilts, with a rounded shape like a ship that can survive a hurricane*, FORTUNE (Nov. 6, 2023), <https://fortune.com/2023/11/06/sustainable-hurricane-resistant-home-building-extreme-weather-climate-change/>; COLORADO CITY REVAMPS FLOOD PLAIN MANAGEMENT AFTER SEVERE FLOOD, PEW CHARITABLE TRS. (Nov. 19, 2019), https://www.pewtrusts.org/-/media/assets/2019/11/colorado_fort_collins_brief_v5.pdf.

shown in the FEMA maps.²⁴⁷ Some critical structures such as hospitals, nursing homes, data storage centers, and power generating centers must be elevated even higher if their reconstruction is to receive FEMA funds.²⁴⁸ The Homeowner Flood Insurance Affordability Act of 2014 allows homeowners to use “alternative mitigation measures” if it is not possible to elevate the homes.²⁴⁹ Some cities have had to amend their zoning or building codes to allow buildings to meet the FEMA standards,²⁵⁰ and several states and localities have even more stringent rules.²⁵¹

FEMA does not require buildings that have not been substantially damaged to be elevated, but if they are elevated, flood insurance can be purchased at a significant discount.²⁵² Between April 1, 2021, and April 1, 2023, FEMA phased in its “Risk Rating 2.0” policy that raises flood insurance rates a considerable amount in many places.²⁵³ FEMA says the rates reflect multiple factors, including “flood frequency, multiple flood types—river overflow, storm surge, coastal erosion and heavy rainfall—and distance to a water source along with property characteristics such as elevation and the cost to rebuild,”²⁵⁴ though it is not clear just how heavy rainfall is reflected. The increased rates have led hundreds of thousands of homeowners to drop their coverage²⁵⁵ and have drawn

247. *Frequently Asked Questions About Building Science: When Does a Flood-Damaged Home Need to be Elevated?*, FED. EMERGENCY MGMT. AGENCY, <https://www.fema.gov/emergency-managers/risk-management/building-science/faq> (Nov. 16, 2021); FED. EMERGENCY MGMT. AGENCY, FOUNDATION REQUIREMENTS AND RECOMMENDATIONS FOR ELEVATED HOMES (2013), https://www.fema.gov/sites/default/files/documents/fema_hurricane-sandy-recovery-fact-sheet.pdf.

248. FED. EMERGENCY MGMT. AGENCY, POLICY NO. 104-22-0003, PARTIAL IMPLEMENTATION OF THE FEDERAL FLOOD RISK MANAGEMENT STANDARD FOR PUBLIC ASSISTANCE (INTERIM) (2022), https://www.fema.gov/sites/default/files/documents/fema_fp-104-22-0003-partial-implementnation-ffrms-pa-interim.pdf; Thomas Frank, *On This Flood Policy, Biden and Trump Agree*, CLIMATEWIRE (June 16, 2022), <https://www.eenews.net/articles/on-this-flood-policy-biden-and-trump-administrations-agree/>.

249. REDUCING FLOOD RISK TO RESIDENTIAL BUILDINGS THAT CANNOT BE ELEVATED, *supra* note 244.

250. N.Y.C. Dep’t of City Plan., Proposed Flood Resilience Text Amendment (2013), <https://www.nyc.gov/assets/planning/download/pdf/plans/flood-resiliency/presentation.pdf>.

251. E.g., New York City Building Code, Appendix G – Flood-Resistant Construction, https://www.nyc.gov/assets/buildings/apps/pdf_viewer/viewer.html?file=2022BC_AppendixG_FloodResistantWBwm.pdf§ion=concode_2022.

252. See REDUCING FLOOD RISK TO RESIDENTIAL BUILDINGS THAT CANNOT BE ELEVATED, *supra* note 244, at 2, 7-9; DISCOUNT EXPLANATION GUIDE, FED. EMERGENCY MGMT. AGENCY (2022), https://www.fema.gov/sites/default/files/documents/fema_discount-Explanation-Guide.pdf.

253. Christopher Flavelle, *The Cost of Insuring Expensive Waterfront Homes Is About to Skyrocket*, N.Y. TIMES (Sept. 24, 2021), <https://www.nytimes.com/2021/09/24/climate/federal-flood-insurance-cost.html>.

254. *NFIP’s Pricing Approach*, NAT’L EMERGENCY MGMT. AGENCY, <https://www.fema.gov/es/node/467888> (last visited Apr. 17, 2024).

255. Thomas Frank, *Hundreds of Thousands Drop Flood Insurance as Rates Rise*, CLIMATEWIRE (Aug. 17, 2022), <https://www.eenews.net/articles/hundreds-of-thousands-drop-flood-insurance-as-rates-rise/>.

considerable controversy. As this is written in the autumn of 2023, Congress is considering alterations to the flood insurance program that may again alter the rate structure.²⁵⁶ A suit brought by ten states challenging the Risk Rating 2.0 policy is pending in federal court in Florida.²⁵⁷ Balancing the desire to keep flood rates affordable, on the one hand, and generating enough premiums for the National Flood Insurance Program to remain solvent without additional Congressional subsidies, on the other hand, has been a constant and still unresolved struggle.

One common method of erecting buildings in flood-prone areas is called “fill-and-build”. It involves clearing the site of vegetation, importing fill to raise the land surface, and putting the building on top, typically on a concrete slab. This method creates new impermeable surface and merely moves the floodwater elsewhere. Several cities have begun banning it²⁵⁸ and FEMA’s Technical Mapping Advisory Board has recommended that it be limited.²⁵⁹ It is an “accommodation” method for the property owner, but to the detriment of the neighbors.

In sum, true accommodation, such as raising buildings on stilts with no sensitive uses at the ground level, is a well-accepted method of coping with floods but it is of little, if any, use with respect to pluvial flooding.

F. Retreat

“Managed retreat” is the idea of intentionally moving people and assets away from areas that are at high risk of flooding or other natural hazards, and not allowing new construction in those areas. In 2018, the National Climate Assessment stated that retreat will be “unavoidable” for some coastal areas in the United States.²⁶⁰

256. National Flood Insurance Program Reauthorization and Reform Act of 2023, S. 2142, 118th Congress (2023); Thomas Frank, *Flood Insurance Rates will Soar in Some Areas, FEMA Says*, CLIMATEWIRE (May 10, 2023), <https://www.eenews.net/articles/flood-insurance-rates-will-soar-in-some-areas-fema-says/>.

257. Thomas Frank, *10 States sue FEMA to Block Higher Flood Insurance Rates*, CLIMATEWIRE (June 2, 2023), <https://subscriber.politicopro.com/article/eenews/2023/06/02/10-states-plan-to-sue-fema-to-block-new-flood-insurance-rates-00099793>.

258. Daniel Cusick & Thomas Frank, *Dangerous 'Fill and Build' Floodplain Policy Should Be Scrapped*, EXPERTS SAY, SCI. AM. (Nov. 1, 2023), <https://www.scientificamerican.com/article/dangerous-fill-and-build-floodplain-policy-should-be-scraped-experts-say/>; Daniel Cusick, *Drowning in Dirt: How Homebuilders are Making Floods Worse*, CLIMATEWIRE (May 9, 2022), <https://www.eenews.net/articles/drowning-in-dirt-how-homebuilders-are-making-floods-worse/>; ANTHROPOCENE ALL., SAVE OUR COMMUNITIES: BAN “FILL AND BUILD”, <https://anthropocenealliance.org/wp-content/uploads/2021/01/Fact-sheet-BanFillandBuild.pdf> (last visited Feb. 17, 2024).

259. Cusick & Frank, *supra* note 258.

260. FOURTH NATIONAL CLIMATE ASSESSMENT, *supra* note 15, at 64.

Managed retreat has received a great deal of attention in the academic and planning communities; it is the subject of numerous conferences, articles and white papers.²⁶¹ However, its actual application has been limited. Local politicians almost always resist the idea; it would reduce their electorate and their tax base, and their constituents seldom want to move.²⁶² Inducing people to leave their homes usually requires the government to buy them out, which is a very expensive proposition if done at scale. Between 1989 and 2019, FEMA has funded managed retreat for around 40,000 properties – less than 0.1% of the more than 49 million housing units in shoreline counties.²⁶³

Difficult as it is to persuade people and their elected representatives that it is wise to move when their homes are in a designated flood hazard area, it appears to be virtually impossible to do so in the absence of such a designation (or at least a history of damaging floods, rather than just one damaging flood). There seem to be few, if any, examples of managed retreat happening as a result of pluvial flooding, and thus this technique does not have much place in the toolkit of legal techniques to deal with urban flooding from pluvial, as opposed to coastal or riverine, flooding.

IV. FINANCING

Coping with urban flooding is extremely expensive. There is no overall estimate of what it would take to prepare adequately. One 2017 study proposed scenarios for New York City based primarily on green infrastructure.²⁶⁴ It estimated that designs for a 100-year storm (as then defined) would require approximately \$370 million in capital costs and \$1.7 million/year in operational points.²⁶⁵ If designed for a 10-year storm, the estimated capital costs were \$110 million.²⁶⁶ The study said that New York City's 10-year capital strategy designed to safeguard roughly the same area to a five-year storm using grey infrastructure is about twice the cost of the \$370 million green infrastructure scenario.²⁶⁷ The study estimated that the \$370 million scenario would yield \$603 million in benefits

261. See, e.g., *Managed Retreat Conference*, COLUMB. UNIV. CLIMATE ADAPTATION INITIATIVE, <https://adaptation.ei.columbia.edu/retreat/home>.

262. Zoya Teirstein, *Retreat from coastlines? Politicians don't want to talk about it.*, GRIST (Apr. 8, 2021), <https://grist.org/climate/retreat-from-coastlines-politicians-dont-want-to-talk-about-it/>.

263. A.R. Siders, *Managed Retreat in the United States*, 1 ONE EARTH 216, 216 (2019).

264. See RAMBOLL A/S, N.Y.C. DEP'T OF ENV'T PROT., CLOUDBURST RESILIENCY PLANNING STUDY: EXECUTIVE SUMMARY (2017), <https://www.nyc.gov/assets/dep/downloads/pdf/climate-resiliency/nyc-clooudburst-study.pdf>.

265. *Id.* at 19.

266. *Id.*

267. *Id.*

(including avoided physical damages, output loss, injuries, mental stress and anxiety, and environmental costs).²⁶⁸

A different study for New York City found that all fourteen of its wastewater treatment plants and 58 of its 96 pumping stations are at risk, and that a 100-year flood with thirty inches of sea level rise (quite possible by the end of this century) could cause more than \$2 billion in damage.²⁶⁹ The study recommended protective measures totaling \$315 million.²⁷⁰ Yet another study for New York City included far higher costs for long-term reduction in combined sewer overflows.²⁷¹

Whatever the city and the plan, the costs of coping with urban flooding are high. A number of methods are being used to pay these costs.

A. Water Charges

Cities typically charge property owners for their water use. In some places it is a flat fee; in other places, the charge is based on usage. The revenues go to both operating and capital costs. Many cities are struggling because they find that the water charges are too low to pay for repairs or replacement of aging infrastructure, even without respect to increased flooding due to climate change.²⁷²

B. State Appropriations

Many states have provided direct appropriations for grey and green infrastructure to control flooding.²⁷³

C. Bond Issues

Rather than paying when the costs of flood control are incurred, many states issue bonds to pay for the capital costs over time. For example, in 2022 the voters of New York State approved the \$4.2 billion Clean Water, Clean Air and Green Jobs Environmental

268. *Id.* at 20.

269. N.Y.C. DEP'T OF ENV'T PROT., NYC STORMWATER RESILIENCY PLAN: CLIMATE RISK ASSESSMENT AND ADAPTATION STUDY 2 (2013), <https://www.nyc.gov/assets/dep/downloads/pdf/climate-resiliency/climate-plan-single-page.pdf>.

270. *Id.*

271. NEW YORK CITY STORMWATER RESILIENCY PLAN, *supra* note 40, at 5-6.

272. STANTEC, N.Y.C. DEP'T OF ENV'T PROT.: BEPA-SRSA COMPARATIVE RATE STRUCTURE ANALYSIS FINAL REPORT 38 (2021), <https://www.nyc.gov/assets/dep/downloads/pdf/whats-new/programs-initiatives/bepa-srsa-comparative-rate-structure-analysis.pdf>.

273. LAURA LIGHTBODY, MATT FUCHS, & SARAH EDWARDS, PEW CHARITABLE TRS., MITIGATION MATTERS: POLICY SOLUTIONS TO REDUCE LOCAL FLOOD RISK 2 (2019), https://www.pewtrusts.org/-/media/assets/2019/11/flood_overview_brief_final.pdf.

Bond Act; about \$250 million of this is dedicated to local stormwater projects, especially in areas prone to flooding.²⁷⁴

D. Federal Assistance

FEMA has several programs that can help communities reduce or prepare for floods. The Flood Mitigation Assistance Grant Program provides funding to states, local communities, federally recognized tribes and territories for projects to reduce or eliminate the risk of repetitive flood damage to buildings.²⁷⁵ It depends on annual appropriations from Congress and is only available to communities that participate in the National Flood Insurance Program.²⁷⁶ A larger program, Building Resilient Infrastructure and Communities (BRIC) was established as part of the Disaster Recovery Reform Act of 2018²⁷⁷ and provides that up to six percent of federal disaster assistance may go to preparing for future disasters.²⁷⁸ FEMA has indicated that nature-based solutions may be eligible for funding under either of these programs, but both operate on a competitive basis and such solutions and other stormwater-related projects will not necessarily receive funding each year.²⁷⁹

As noted previously, the IIJA provides approximately \$34.7 billion toward enhanced flood mitigation, resilience, and disaster preparedness programs.²⁸⁰

The Federal Water Pollution Control Act Amendments of 1972 (part of what is now the Clean Water Act) created a program to pay for 75% (reduced to 55% in 1981) of the costs of building wastewater

274. Brendan J. Lyons, *New York voters overwhelmingly pass Environmental Bond Act*, ALBANY TIMES UNION (Nov 9, 2022), <https://www.timesunion.com/state/article/New-York-Environmental-Bond-Act-17567482.php>.

275. *Flood Mitigation Assistance Grant Program*, FED. EMERGENCY MGMT. AGENCY, <https://www.fema.gov/grants/mitigation/floods> (last visited Feb. 18, 2024).

276. FED. EMERGENCY MGMT. AGENCY, HAZARD MITIGATION ASSISTANCE PROGRAM AND POLICY GUIDE 33 (2023), https://www.fema.gov/sites/default/files/documents/fema_hma-program-policy-guide_032023.pdf.

277. Disaster Recovery Reform Act of 2018, Pub. L. No. 115-254, 132 Stat. 3438-3469 (2018); Carlos Martin et al., *Federal disaster management is a confusing patchwork. Reforming FEMA and improving interagency coordination can fix it*, BROOKINGS INST. (Aug. 3, 2023), <https://www.brookings.edu/articles/federal-disaster-management-is-a-confusing-patchwork-reforming-fema-and-improving-interagency-coordination-can-fix-it/>.

278. FED. EMERGENCY MGMT. AGENCY, HAZARD MITIGATION ASSISTANCE PROGRAM AND POLICY GUIDE 32, *supra* note 276.

279. FED. EMERGENCY MGMT. AGENCY, BUILDING COMMUNITY RESILIENCE WITH NATURE-BASED SOLUTIONS 26 (2021), https://www.fema.gov/sites/default/files/documents/fema_riskmap-nature-based-solutions-guide_2021.pdf.

280. *The Bipartisan Infrastructure Bill Will Create Flood-Resilient Communities – Here's How*, AM. FLOOD COAL. (Nov. 15, 2021), <https://floodcoalition.org/2021/11/the-bipartisan-infrastructure-bill-will-create-flood-resilient-communities-heres-how/>.

treatment plants and sewers.²⁸¹ Congress ultimately appropriated nearly \$41 billion for this program, making it the largest nonmilitary public works program since the Interstate Highway System.²⁸² The Reagan Administration targeted this program for budget cuts, and in 1987 Congress acted to phase out the grant program and replace it with a revolving loan program.²⁸³ As a result, federal assistance for wastewater treatment systems became considerably less generous.²⁸⁴ Several other agencies run smaller programs that include wastewater facilities among the eligible grants.²⁸⁵

E. Special State Funds

Several states have established special funds to undertake flood mitigation projects. Iowa established a flood mitigation fund, using a local sales tax, to pay for flood protection measures.²⁸⁶ Indiana²⁸⁷ and Maryland²⁸⁸ both have state-funded revolving fund programs for political subdivisions undertaking flood control projects. The Texas Flood Infrastructure Fund, established in 2019 through an amendment to the state constitution, provides financial support to communities for drainage, flood mitigation, and flood control projects.²⁸⁹

F. Stormwater Fees

At least two-thousand U.S. cities in the forty-eight contiguous states and Washington, D.C., have “stormwater utilities” that charge stormwater fees to property owners, mostly to pay for grey

281. See JONATHAN L. RAMSEUR, CONG. RSCH. SERV., R46471, FEDERALLY SUPPORTED PROJECTS AND PROGRAMS FOR WASTEWATER, DRINKING WATER, AND WATER SUPPLY INFRASTRUCTURE 1 (2022), <https://crsreports.congress.gov/product/pdf/R/R46471>.

282. *Id.*

283. *Id.*

284. JONATHAN L. RAMSEUR & MARY TIEMANN, CONG. RSCH. SERV., 96-647, WATER INFRASTRUCTURE FINANCING: HISTORY OF EPA APPROPRIATIONS 1 (2019), https://www.everycrsreport.com/files/20190410_96-647_981dcf4b10a712aad371e7b8bce38a4430f1608d.pdf.

285. See RAMSEUR, *supra* note 281, at 1.

286. *Iowa Flood Mitigation Board*, IOWA DEP’T OF HOMELAND SEC. & EMERGENCY MGMT., <https://homelandsecurity.iowa.gov/flood-mitigation-board/> (last visited Feb. 13, 2024).

287. *Flood Control*, IND. FIN. AUTH., <https://www.in.gov/ifa/srf/flood-control/> (last visited Feb. 13, 2024).

288. *Resilient Maryland Revolving Loan Fund*, MD. DEP’T OF EMERGENCY MGMT., <https://mdem.maryland.gov/Pages/rlf-fund.aspx> (last visited Feb. 13, 2024).

289. *Flood Infrastructure Fund (FIF)*, TEX. WATER DEV. BD., <https://www.twdb.texas.gov/financial/programs/FIF/index.asp> (last visited Feb. 13, 2024); *see also Texas Flood Insurance Fund, ADAPTATION CLEARINGHOUSE*, (2019), <https://www.adaptationclearinghouse.org/resources/texas-flood-infrastructure-fund-a.html>.

and green infrastructure.²⁹⁰ The fees are typically based on the amount of impermeable surface, and the fees go down if more surface is permeable (think grass or gravel rather than cement or asphalt, or porous paving blocks rather than marble).²⁹¹ Depending on how they are structured, these fees provide a stable source of revenue for the needed work and also give property owners an incentive to properly manage their stormwater.²⁹²

Washington, D.C., has established a Stormwater Retention Credit market; if developers cannot capture enough of the rain that falls on their properties to meet the standards, they can buy credits from owners of properties that have more permeable surface than they need to absorb their own stormwater.²⁹³ StormStore in Cook County, Illinois, a partnership of The Nature Conservancy and the Metropolitan Planning Council, is similar.²⁹⁴ Landowners in certain Chicago suburbs who are able to manage stormwater by installing rain gardens, bioswales, or other natural features can sell stormwater credits to developers in the same watershed who cannot manage enough stormwater on their own property to meet requirements.²⁹⁵

G. Incentives

Vermont's Emergency Relief and Assistance Fund provides state funding to match federal public assistance after federally-declared disasters, and it contributes extra money to communities that have taken specific steps to reduce flood damage.²⁹⁶ Arkansas gives income tax credits to taxpayers who develop, restore, or conserve

290. Warren Campbell & Jerry Bradshaw, *Western Kentucky University Stormwater Utility Survey 2021*, W. KY. UNIV. SEAS FAC. PUBL'NS (2021) (noting that all 48 contiguous states have at least one stormwater utility); *The Property Owner Guide to Stormwater Utility Fees*, RAINPLAN, <https://myrainplan.com/what-are-stormwater-utility-fees/#:~:text=Stormwater%20fees%20are%20a%20new,charges%20on%20your%20utility%20bill> (asserting that more than 2,000 U.S. cities have a stormwater utility).

291. Warren Campbell & Emily G. Davis, *Western Kentucky University Stormwater Utility Survey 2023*, W. KY. UNIV.:SEAS FAC. PUBL'NS 19 (2023).

292. Nathaniel R. Mattison, *The Legal Case for Stormwater Fees in New York City*, 86 ALB. L. REV. 4 687, 694 (2023).

293. *Stormwater Credit Trading: Lessons from Washington, D.C.*, METRO. PLAN. COUNCIL: NEWS BLOG (Jan. 23, 2019), <https://www.metroplanning.org/news/8671/>.

294. See STORMSTORE, <https://www.stormstore.org/> (last visited Feb. 13, 2024).

295. *Building a StormStore for Cook County*, THE NATURE CONSERVANCY (May 5, 2020), <https://www.nature.org/en-us/about-us/where-we-work/united-states/illinois/stories-in-illinois/stormwater-trading/>.

296. *Emergency Relief and Assistance Fund*, STATE OF VT. FLOOD READY, https://floodready.vermont.gov/find_funding/emergency_relief_assistance (last visited Feb. 13, 2024).

wetland and riparian zones.²⁹⁷ The village of South Holland, Illinois provides rebates to residents to undertake flood control projects on their property.²⁹⁸

As noted above, the National Flood Insurance Program was intended to provide local governments with incentives to adopt land use and building rules that could reduce flooding, but it has worked poorly.

H. Landlords

Building owners may, of course, pay for flood protections for their buildings. Unless required by building codes or other legal mandates, few are likely to spend much of their own money on such work, and it would be difficult for them to pass the costs along to any but the wealthiest tenants. Imposing requirements on new construction is rather straightforward; mandating retrofits of existing buildings is far more difficult.

The financing of building retrofits received stark attention in a situation unrelated to flooding—the July 2021 collapse of a condominium building in Surfside, Florida, that killed ninety-eight people.²⁹⁹ Engineers had been warning for years that the building needed structural repairs, but it took several years (and much internal fighting) for the condominium board to approve a \$15 million special assessment, and the work was not completed in time.³⁰⁰ The members of these boards receive great pressure from fellow owners not to spend everyone’s money on repairs.³⁰¹ Among the proposals that have emerged from this disaster are leaving the final decisions on repairs to engineers, not board members; requiring ample reserves to be set aside in segregated accounts to ensure there will be money to pay for repairs needed for safety, without the need for a huge one-time special assessment; more frequent and intense government inspections; requiring buildings along coastlines to have waterproofing; and creating government-backed funds to assist with financing the repairs.³⁰² The “business judgment rule” (insulating corporate boards from liability for

297. *Wetland & Riparian Zones Tax Credit Program*, ARK. DEPT OF AGRIC., <https://www.agriculture.arkansas.gov/natural-resources/divisions/water-management/wetlands-riparian-zone-tax-credit-program/> (last visited Feb. 15, 2024).

298. *Flood Assistance*, VILL. OF S. HOLLAND, https://www.southholland.org/departments/public_works/flood_resources/flood_assistance/ (last visited Feb. 15, 2024).

299. See David B. Haber, *I Know All About Condo Living. Let’s Fix It*, N.Y. TIMES, July 31, 2021, at A19; Michael LaForgia et al., *Lax Enforcement Let South Florida Towers Skirt Inspections for Years*, N.Y. TIMES (July 4, 2021), <https://www.nytimes.com/2021/07/04/us/south-florida-condo-maintenance-violations.html>.

300. See Haber, *supra* note 299, at A19.

301. *Id.*

302. *Id.*; LaForgia et al., *supra* note 299.

decisions that seemed rational when made, even if wrong) provides protection to condominium board members,³⁰³ but the massive litigation that has followed the Surfside collapse may test the limits of this insulation.³⁰⁴ It is not yet clear whether climate change played a role in that collapse,³⁰⁵ but many buildings along coastlines will face increasing perils from rising seas, and condo boards (as well as other building owners, tenants, and financiers) will face very tough decisions.

Programs have been proposed (but not adopted) to provide low-interest loans to landlords so that they can retrofit their buildings to provide greater flood protection, to be repaid by surcharges on property tax bills, similar to the PACE (Property Assisted Clean Energy) program for energy efficiency retrofits.³⁰⁶ Another proposal has been to reduce property taxes for low-income homeowners for capital upgrades to address flooding-related issues.³⁰⁷

I. Litigation

About two dozen cases are currently pending in the U.S. brought mostly by states and cities against fossil fuel companies seeking money damages to help the plaintiffs pay for adaptation measures.³⁰⁸ The cases were held up for several years by disputes over whether they belong in state court (where the plaintiffs prefer) or in federal court (where the defendants prefer).³⁰⁹ All the Court of Appeals decisions said the cases should be in state court, and in 2022 the Supreme Court refused to take up any of these cases, so they have remained in state court so far.³¹⁰ As this is written, there is considerable motion practice about the fate of these cases, and it

303. Deborah Koplovitz & Andrew Freedland, *Cooperatives and Condominiums: Board Repair Obligations, Revisited*, 266 N.Y. L.J. 3 (Sept. 2, 2021).

304. See, e.g., Curt Anderson, *\$997 million settlement reached in Surfside condo collapse lawsuit, lawyers say*, USA TODAY (May 11, 2022), <https://www.usatoday.com/story/news/nation/2022/05/11/surfside-condo-collapse-class-action-lawsuit-families-victims/9738407002/>.

305. See Randall W. Parkinson, *Speculation on the Role of Sea-level Rise in the Tragic Collapse of the Surfside Condominium (Miami Beach, Florida U.S.A.) was a Bellwether Moment for Coastal Zone Management Practitioners*, 215 OCEAN & COASTAL MGMT. (2021).

306. THE NEW NORMAL, *supra* note 147, at 62-63.

307. *Id.* at 61.

308. See MICHAEL BERGER & MARIA ANTONIA TIGRE, U.N. ENV'T PROGRAMME & SABIN CTR. FOR CLIMATE CHANGE L., GLOBAL CLIMATE LITIGATION REPORT: 2023 STATUS REVIEW 53 (2023), https://scholarship.law.columbia.edu/cgi/viewcontent.cgi?article=1203&context=sabin_climate_change (discussing pending litigation).

309. See *id.*

310. *Id.*

is highly uncertain whether they will ultimately become a source of funding for adaptation.³¹¹

Several efforts to use the courts to force municipalities to undertake stormwater and other flood improvements have failed.³¹²

J. Nonprofits

Some nonprofits are playing a role. For example, a public benefit company called MyStrongHome strengthens roofs so that they can better endure extreme weather.³¹³ This work lowers insurance premiums, and the company reduces the homeowners' up-front cost of the new roof by capturing some of the premium savings.³¹⁴ Several foundations have assisted with the financing.³¹⁵

In sum, numerous sources of money are available to help with flood protection measures, but it is not clear whether they add up to enough to fully address the problem.

V. SETTING PRIORITIES

As we have seen, most of the facilities dealing with urban flooding—whether grey or green—are owned or controlled by cities. City governments must make many decisions concerning building or modifying these facilities, including what, when and where.

Important technical steps in making these decisions include estimating future rainfall levels, especially in view of climate change; determining the impacts of nearby rivers, lakes, and oceans on flooding; and estimating how much of the rainwater will be absorbed into the ground and how much will make its way into the pipes, based on such factors as the topography and the permeability

311. *Id.*; see also *City & Cnty. of Honolulu v. Sunoco LP*, 537 P.3d 1173 (Haw. 2023) (denying defendants' motions to dismiss in one of these cases, allowing it to go to trial). At the time of publication, there is a pending petition for certiorari in the *Sunoco* case. See Petition for Writ of Certiorari, *Sunoco LP*, No. 23-947 (Mar. 1, 2024).

312. See *Harris Cnty. Flood Control Dist. v. Kerr*, 499 S.W.3d 793 (Tex. 2016); see also Jennifer Klein, *SABIN CTR. FOR CLIMATE CHANGE L.*, *Potential Liability of Governments for Failure to Prepare for Climate Change* (2015), https://scholarship.law.columbia.edu/cgi/viewcontent.cgi?article=1124&context=sabin_climate_change; see also ALICE C. HILL & LEONARDO MARTINEZ-DIAZ, *BUILDING A RESILIENT TOMORROW: HOW TO PREPARE FOR THE COMING CLIMATE DISRUPTION* 40-46 (2020); Michael B. Gerrard, *Governmental and Private Liability for Flooding*, 246 N.Y. L.J. (Nov. 10, 2011), <https://climate.law.columbia.edu/sites/default/files/content/docs/Michael%20Gerrard/Gerrard-2011-11-GovernmentPrivate-Liability-for-Flooding.pdf>.

313. *Calvert Foundation Announces \$8 Million Investment in MyStrongHome*, PR NEWSWIRE (May 30, 2017, 12:00 PM), <https://www.prnewswire.com/news-releases/calvert-foundation-announces-8-million-investment-in-mystronghome-300465403.html>.

314. *Id.*

315. *Id.*

of the ground surface (such as how much of it is covered with buildings or pavement). But estimates of future rainfall are the foundation of their calculations.³¹⁶ These estimates are also used to design roads, train tracks, concentrated animal feeding operations, and many other facilities. These are all decisions to be made by technical experts like engineers and hydrologists. These experts must also advise on how much the work would cost, how long it would take, and how much disruption it will cause. For much green infrastructure, the availability of land is an especially important factor.

Beyond these essentially technical matters, political judgments must be made. To the extent that dedicated grant funds are not available or sufficient, how much of the city's budget should go to controlling flooding, in view of all the competing demands on the budget? Should taxes or sewer fees be raised? Should the expense be borne now or passed on to future officials/taxpayers/generations through borrowing? Should some parts of the city receive more or faster protections than others?

One especially fraught issue is tolerance for risk. How much flooding is too much? One bit of legal guidance is found in the FEMA regulations that define a "critical action" as "an action for which even a slight chance of flooding is too great." These include the construction of facilities that "produce, use or store highly volatile, flammable, explosive, toxic or water-reactive materials," "hospitals and nursing homes, and housing for the elderly, which are likely to contain occupants who may not be sufficiently mobile to avoid the loss of life or injury during flood and storm events," emergency operations centers, and electricity generating plants. For these, even a floodplain with a one-in-five-hundred chance of flooding in a given year may be too dangerous.³¹⁷ For less sensitive uses, more frequent flooding is considered tolerable.

Beyond that, little legal guidance is available. Copenhagen's Cloudburst Management Plan, which has received a good deal of positive attention in the climate adaptation community, attempts to quantify the goals: "In the future: sewer discharge will be allowed to reach ground level once every ten years, and average water levels will be allowed to exceed ground level by ten centimeters once every 100 years, excepting areas specifically designated for flood control

316. GERALD E. GALLOWAY ET AL., THE GROWING THREAT OF URBAN FLOODING: A NATIONAL CHALLENGE 33 (2018), https://cdr.umd.edu/sites/cdr.umd.edu/files/resource_documents/COMPRESSEDDurban-flooding-report-online-compressed-0319.pdf.

317. 44 C.F.R. § 9.4.

storage.”³¹⁸ Recognizing that not everything can be done at once, the plan also listed “essential elements to be considered when ranking the initiative,” as follows: “[h]igh risk areas;” “[a]reas where measures are easy to implement;” “[a]reas with ongoing urban development projects” (i.e., if the flood-related work can be done in conjunction with other ongoing construction); and “[a]reas where synergistic effects can be gained.”³¹⁹

To these items, one should also add, for example, addressing existing disproportionate exposure of disadvantaged communities to flood risks; reducing adverse health effects of exposure to untreated sewage; and positive and negative effects of green infrastructure on biodiversity.

While Copenhagen’s goals are laudable, it is not at all clear whether they will be met, there or elsewhere, especially in the long term in view of climate trends. That makes conscious choices all the more important. At the same time that cities are coping with pluvial flooding (and perhaps coastal and riverine flooding, depending on their location), they will also have to deal with the other pressures worsened by climate change such as heat waves and wildfires, on top of the pressing need to transition their energy systems away from fossil fuels.

One factor that is important in all these measures is the availability of money. While Congress has sometimes been generous to localities that have suffered natural disasters, it cannot be counted on to keep paying for disaster preparation and response everywhere, in a future where the entire country is facing climate-related perils of various sorts, and where the accumulated federal debt is already high. State and local governments will shoulder most of the burden, and they will have to take a hard look at the amount and distribution of taxes they impose. When they do, they should also consider what happens if they do not gather and spend this money, since we know that it is far cheaper to prepare for disasters than to recover from them, if recovery is even possible.

318. CITY OF COPENHAGEN, THE CITY OF COPENHAGEN CLOUDBURST MANAGEMENT PLAN 2012 12 (2012), https://en.klimatilpasning.dk/media/665626/cph_-_cloudburst_management_plan.pdf.

319. *Id.* at 14.

A TAKING IS A TAKING IS A TAKING . . . AND JURIES KNOW ONE WHEN THEY SEE IT

MICHAEL M. BERGER^(*)

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So, what's wrong with *Penn Central*?¹ How much time do you have? For something that the Supreme Court has retroactively referred to as its "polestar" in takings litigation, *Penn Central* has come in for more than what some might call its fair share of abuse.²

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1. *Penn Cent. Transp. Co. v. City of New York*, 438 U.S. 104 (1978).
2. See, e.g., Joseph L. Sax, *The Property Rights Sweepstakes: Has Anyone Held the Winning Ticket?*, 34 VT. L. REV. 157, 159 (2009) (stating that the *Penn Central* inquiry is an "open-ended, I-(hope)-I-know-it-when-I-see-it approach" to takings adjudication.); Steven J. Eagle, *The Four-Factor Penn Central Regulatory Takings Test*, 118 PA. ST. L. REV. 601, 602 (2014) ("The [*Penn Central*] doctrine has become a compilation of moving parts that are neither individually coherent nor collectively compatible."); Steven J. Eagle, *Property Rights and Takings Burdens*, 7 BRIGHAM-KANNER PROP. RTS. CONF. 199 (2018) (The *Penn Central* test is "generally deemed incoherent and chaotic."); Gideon Kanner, *Hunting the Snark, Not the Quark: Has the U.S. Supreme Court Been Competent in Its Effort to Formulate Coherent Regulatory Takings Law?*, 30 URB. L. 307 (1998) [hereinafter *Hunting the Snark*]; John D. Echeverria, *Is the Penn Central Three-Factor Test Ready for History's Dustbin?*, 52 LAND USE L. & ZONING DIG. 3, 7 (2000) ("The *Penn Central* test . . . is so vague and indeterminate that it invites unprincipled, subjective decision making by the courts); R.S. Radford & Luke A. Wake, *Deciphering and Extrapolating: Searching for Sense in Penn Central*, 38 ECOLOGY L.Q. 731, 732 (2011) ("a tenuous, ad hoc approach . . . routinely denounced as . . . unworkable, if not incomprehensible"); Joseph William Singer, *Justifying Regulatory Takings*, 41 OHIO N. U. L. REV. 601, 603 (2015) ("Scholars have long derided the regulatory takings doctrine as incoherent and unpredictable."); David L. Callies, *Regulatory Takings and the Supreme Court: How Perspectives on Property Rights Have Changed from Penn Central to Dolan*, and

The phrase “fair share” doesn’t quite cut it. More abuse is evidently needed so we can put an end to *Penn Central*’s dominance.³

To that end, many people have been proposing alternatives or changes to the *Penn Central* standard that might fix or replace it. I will be blunt. Ever the optimist, I trusted that the Supreme Court would eventually get its act together and provide a coherent takings jurisprudence.⁴ At least it could make sense of *Penn Central*, which has been cited so often. I no longer think *Penn Central* can be saved. Our experience with it for the near half-century since the Supreme Court gave birth to it has shown clearly that the judiciary has made a hash of the process. Worse than that, jurists at the highest level seem proud of the fact that they have given the rest of us little direction by which to be guided. This is typical of the Court, which has stated: “we have given some, but not too specific, guidance to courts confronted with deciding whether a particular government action goes too far and effects a regulatory taking.”⁵ It is time to acknowledge that such pablum from our highest court is no longer acceptable.

My conclusion is that *Penn Central* needs to be excised from the takings liturgy. We need to hit the restart button.

As discussed hereafter, I have a couple of suggestions for the Court. Without getting too far ahead of myself, here is the most critical piece: Judges at all levels should stop trying to define the parameters of a taking. Whether a taking has occurred, i.e., whether government action has gone “too far”, in the classic formulation of Justice Holmes,⁶ is a *fact* question, not a legal one. It should be

What State and Federal Courts Are Doing About It, 28 STETSON L. REV. 523, 574 (1999) (surveying inconsistent judicial approaches and concluding that “state (and some lower federal) courts are not hearing (or not wanting to hear) the U.S. Supreme Court”).

On the other hand, if one searches hard enough, one can discover those who believe that vagueness is just peachy. *See, e.g.*, Marc R. Poirier, *The Virtue of Vagueness in Takings Doctrine*, 24 CARDOZO L. REV. 93, 94 (2002) (positing that “argument and practice within the vacuous framework they lay down, provide stability, coherence, and legitimacy for the ongoing social process of managing resources.”). How a concededly “vacuous framework” yields “stability, coherence, and legitimacy” remains (at least to me) a mystery. For some possible insight (and a suggestion that it may have something to do with “progressives” seeking radical change to property law), see Michael M. Berger, *Protecting Property: A Tribute to Jim Burling*, 12 BRIGHAM-KANNER PROP. RTS. CONF. J. 21, 48 (2023) [hereinafter *Protecting Property*].

3. Anyone who has not done so should immediately read Gideon Kanner’s classic work on *Penn Central* and how the decision came about. If you’ve read it before, read it again. *See generally* Gideon Kanner, *Making Laws And Sausages: A Quarter-Century Retrospective On Penn Central Transportation Co. v. City Of New York*, 13 WM. & MARY CIV. RTS. J. 679 (2005).

4. After all, it was starting from the bottom of a pretty deep hole. As Justice Stevens put it early in the modern takings era, “[e]ven the wisest lawyers would have to acknowledge great uncertainty about the scope of this Court’s takings jurisprudence.” *Nollan v. Cal. Coastal Comm’n.*, 483 U.S. 825, 866 (Stevens, J., dissenting). So, there was plenty of room for the Court to move in rationalizing this body of law.

5. *Palazzolo v. Rhode Island*, 533 U.S. 606, 617 (2001).

6. *Pa. Coal Co. v. Mahon*, 260 U.S. 393 (1922).

decided the same way that fact questions have been decided in Anglo-American law for centuries. Judges need to back away from the details and let juries examine all the evidence and then decide whether the government's actions have taken property. That is the core issue, and it is an issue for the jury.

I. BACK TO BASICS⁷

The Constitution requires just compensation for all takings, regardless of their length or the manner of their instigation. Thus, the issue is neither whether the property was taken temporarily, nor the means by which it was taken, but whether it was taken at all. If the answer is "yes", compensation follows.

Justice Brennan put his finger squarely on the issue:

The fact that a regulatory "taking" may be temporary, by virtue of the government's power to rescind or amend the regulation, does not make it any less of a constitutional "taking." Nothing in the Just Compensation Clause suggests that "takings" must be permanent and irrevocable. Nor does the temporary reversible quality of a regulatory "taking" render compensation for the time of the "taking" any less obligatory. This Court more than once has recognized that temporary reversible "takings" should be analyzed according to the same constitutional framework applied to permanent irreversible "takings."⁸

This section will analyze the nature of takings and show that the concept of "temporary" takings is doctrinally and constitutionally beside the point, as the government *always* has it within its power to make *any* taking "temporary" by returning what it took,⁹ but this does not eliminate the need for compensation for the duration of the taking. The same is true for the mode of taking. At bottom, the issue is the negative impact of government action on the rights of private property owners. No more; but, surely, no less. If the impact of the government's action is severe, i.e., if it has gone "too far," then compensation is due. As the cases show, all sorts of government action, ranging from regulation to various kinds of physical

7. This section builds on analysis appearing in Berger, *Protecting Property*, *supra* note 2.

8. *San Diego Gas & Elec. Co. v. San Diego*, 450 U.S. 621, 657 (1981) (Brennan, J., dissenting).

9. *See Kirby Forest Indus., Inc. v. United States*, 467 U.S. 1, 12 (1984) Court (explaining that the government may, if it chooses, abandon even a formal condemnation proceeding after trial).

invasion, have been held to be takings. And that should be the end of the question.

Overlaying this entire discussion is this central premise: the Bill of Rights was adopted to protect people against the government, not the other way round. No provision of the Bill of Rights protects the government against individuals. Thus, when presented with a choice of protecting citizens or protecting government, the choice is easy. The citizens should always win in such a tug-of-war. Thus, I opt for a broad conception of what constitutes a taking, as that is the way to provide the most protection to individuals and to most effectively carry out the goals of the Fifth Amendment.

A. All Takings Require Compensation

Aside from direct condemnations, there are two kinds of takings, labeled by the manner of their imposition. One is caused by direct physical invasion,¹⁰ the other by regulation.¹¹ But, convenient as they may be for descriptive purposes, these labels are a constitutional irrelevancy; either form requires Fifth Amendment compensation.¹²

We will begin with an analysis of Justice Brennan's dissenting opinion in *San Diego Gas & Electric Co. v. City of San Diego*.¹³ The reason for that is simple. After the Supreme Court struggled in several opinions to find any common ground in defining the proper remedy for a regulatory taking, *San Diego Gas* shed some light. Albeit the light may have been flickering and uncertain, but it provided more certainty than we had had before. The reason for that lay in a strange sort of vote counting. Four justices believed that the case was not ripe for decision and voted to uphold the lower court's decision in favor of the government. In dissent, Justice Brennan urged that the decision was ripe and that the property owner ought to win. That position also had four votes. Justice Rehnquist filed a separate concurring opinion that agreed that the case was not ripe. Thus, he provided the fifth vote for the government. But he went further and said that if the case had been ripe, he would agree with Justice Brennan on the merits.¹⁴ From that time on, the takings bar was holding its collective breath, waiting to see whether the five-Justice majority could find a case to attach to. But that gets ahead

10. See, e.g., *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419 (1982); *United States v. Causby*, 328 U.S. 256 (1946).

11. See, e.g., *First Eng. Evangelical Lutheran Church v. Cnty. of L.A.*, 482 U.S. 304 (1987); *City of Monterey v. Del Monte Dunes*, 526 U.S. 687 (1999).

12. *Lucas v. S.C. Coastal Council*, 505 U.S. 1003, 1015 (1992).

13. *San Diego Gas*, 450 U.S. 621 (1981).

14. *Id.* at 633-34 (Rehnquist, J., concurring).

of the story. It also explains why a dissenting opinion could be deemed so important in the development of takings law. In his dissent in *San Diego Gas*, Justice Brennan expounded on what might be called a “unified field theory” of takings jurisprudence. His opinion drew upon all sorts of takings, without differentiation, to demonstrate the common constitutional thread uniting them all and stressed the “essential similarity of regulatory ‘takings’ and other ‘takings.’”¹⁵

To illustrate the breadth of the takings concept, Brennan’s analysis linked a permanent direct condemnation case¹⁶ with flooding cases (both intended¹⁷ and unintended¹⁸), a navigable servitude case,¹⁹ an aircraft overflight case,²⁰ a mining regulation case,²¹ and temporary direct condemnation cases,²² among others.²³ In his pragmatic view, born of a bedrock belief in the Bill of Rights as the individual’s shield against governmental overreaching,²⁴ all these impositions on private property owners were takings requiring compensation.²⁵ The broad range of causative actions serves to demonstrate that the bottom line in this constitutional analysis is not keyed to any specific kind of action. Government liability follows from the impact of its actions. The fact that some actions may have been for temporary periods of time merely affected the amount of compensation that would be due.²⁶ Later court decisions agree. As the Supreme Court put it in *Cedar Point Nursery v. Hassid*, “[t]he duration of an appropriation . . . bears only on the amount of compensation.”²⁷

15. *Id.* at 651 (Brennan, J., dissenting).

16. *Berman v. Parker*, 348 U.S. 26 (1954).

17. *United States v. Dickinson*, 331 U.S. 745 (1947).

18. *Pumpelly v. Green Bay Co.*, 80 U.S. 166 (1872).

19. *Kaiser Aetna v. United States*, 444 U.S. 164 (1979).

20. *United States v. Causby*, 328 U.S. 256 (1946).

21. *Pa. Coal Co. v. Mahon*, 260 U.S. 393 (1922).

22. *Kimball Laundry Co. v. United States*, 338 U.S. 1 (1949); *United States v. Petty Motor Co.*, 327 U.S. 372 (1946); *United States v. Gen. Motors Corp.*, 323 U.S. 373 (1945). These were cases where property was condemned for the duration of the war, but they were clearly compensable, resulting in these well-known decisions on compensability.

23. *San Diego Gas & Elec. Co. v. City of San Diego*, 450 U.S. 621, 651-53, 656-60 (1981) (Brennan, J., dissenting).

24. See CHARLES M. HAAR & JEROLD S. KAYDEN, LANDMARK JUSTICE: THE INFLUENCE OF WILLIAM J. BRENNAN ON AMERICA’S COMMUNITIES (1989).

25. Justice Brennan’s formulation recognizes that there are a “nearly infinite variety of ways in which government actions or regulations can affect property interests[.]” *Ark. Game & Fish Comm’n v. United States*, 568 U.S. 23, 31 (2012).

26. *Id.* at 658-60; *Lucas v. S.C. Coastal Council*, 505 U.S. 1003, 1032-33 (1992) (“If this deprivation amounts to a taking, its limited duration will not bar constitutional relief.”) (Kennedy, J., concurring).

27. *Cedar Point Nursery v. Hassid*, 141 S. Ct. 2066, 2074 (2021); see also *Skip Kirchdorfer, Inc. v. United States*, 6 F.3d 1573, 1583 (Fed. Cir. 1993) (“The limited duration of this taking is relevant to the issue of what compensation is just, and not to the issue of

The genius of this formulation is that it makes the law relatively straightforward to apply. When little or no damage is done, then landowners will either not file suit (this type of litigation is neither pleasant nor inexpensive)²⁸ or recover little or nothing after trial.²⁹ Legally, however, it recognizes a freeze on use for what it is: a taking for the duration of the freeze.

The language of the Fifth Amendment is clear and not to be tampered with. When government action interferes severely with the ability of private property owners to use their land in an economically productive fashion, then a taking occurs and compensation must be paid:

The language of the Fifth Amendment prohibits the “tak[ing]” of private property for “public use” without payment of ‘just compensation.’ As soon as private property has been taken, whether through formal condemnation proceedings, occupancy, physical invasion, or regulation, the landowner has *already* suffered a constitutional violation, and “the self-executing character of the constitutional provision with respect to compensation,” . . . is triggered. This Court has consistently recognized that the just compensation requirement in the Fifth Amendment is not precatory: once there is a “taking,” compensation *must* be awarded.³⁰

Six years later, the Supreme Court once again considered the regulatory takings remedy issue in *First English Evangelical Lutheran Church v. County of Los Angeles*.³¹ By that time, Justice Rehnquist had become the Chief Justice, and he assigned the opinion to himself. As he had implicitly promised in his concurring

whether a taking has occurred.”); *Handler v. United States*, 952 F.2d 1364, 1376 (Fed. Cir. 1991) (“[T]he fact that [the government’s] action was finite went to the determination of compensation rather than to the question of whether a taking had occurred.”).

28. The Supreme Court’s own records reveal the lengths to which such litigation can go. *Tahoe-Sierra*, for example, was filed in 1984, and resulted in four separate trips to the Ninth Circuit before arriving at the Supreme Court in 2002. *Tahoe-Sierra Pres. Council, Inc. v. Tahoe Reg’l Plan. Agency*, 535 U.S. 302 (2002). *Del Monte Dunes* began its administrative proceedings in 1981 and its litigation in 1986 before concluding at the Supreme Court in 1999. *City of Monterey v. Del Monte Dunes*, 526 U.S. 687 (1999). It took the landowner in *Agins* 30 years to finally receive permission to build four homes on her 5-acre parcel. *Agins v. City of Tiburon*, 447 U.S. 255 (1980); *see also* Kanner, *Hunting the Snark*, *supra* note 2, at 340 n.127, 345 n.149.

29. As the Supreme Court recognized in *Kirby Forest Indus.*, property owners are not likely to litigate unless the harm for which recompense is sought is substantial. *Kirby Forest Indus., Inc. v. United States*, 467 U.S. 1, 19 n.29 (1984). Nor are lawyers likely to get involved in *de minimis* matters on contingent fee agreements. *Id.*

30. *San Diego Gas & Elec. Co. v. City of San Diego*, 450 U.S. 621, 654 (1981) (Brennan, J., dissenting) (emphasis in original) (citations omitted).

31. *First Eng. Evangelical Lutheran Church v. Cnty. of L.A.*, 482 U.S. 304 (1987).

opinion in *San Diego Gas*, the Chief Justice wrote an opinion for the Court that adopted Justice Brennan's theory as its own.³² The opinion analyzed and applied the same mix of takings cases—direct condemnations, along with a variety of physically invasive and regulatory inverse condemnations, both permanent and temporary³³—and reached the same conclusion: all forms of taking require compensation under the Fifth Amendment. Indeed, the Supreme Court emphasized the similarity between direct condemnations for short periods and regulatory takings for similar time periods and concluded that the two are “not different in kind.”³⁴

In one of the first lower court applications of *First English*, the Eleventh Circuit Court of Appeals concluded that, “[i]n the case of a temporary regulatory taking, the landowner’s loss takes the form of an injury to the property’s potential for producing income or an expected profit.”³⁵ That is an apt description of what happens in any takings case. Government action (either physical or regulatory) plainly takes the property’s use and potential for whatever period of time a court cares to examine.

*Lucas v. South Carolina Coastal Council*³⁶ brought it all together.³⁷ That case involved South Carolina’s effort to protect and preserve its shoreline. After all but two lots in an exclusive oceanfront residential subdivision were built upon, a new law prevented any further construction. The Supreme Court held that the owner of the last two vacant lots was entitled to compensation if the new law precluded all economically beneficial or productive use of his land.³⁸ The Court expressly reaffirmed Justice Brennan’s *San Diego Gas* analysis that deprivation of economically productive use is, from the owner’s viewpoint, the same as taking physical possession.³⁹ On remand, the South Carolina Supreme Court found a temporary taking as a matter of law and ordered compensation.⁴⁰

32. *First English* repeatedly cites Justice Brennan’s *San Diego Gas* dissent as authoritative. *First Eng.*, 482 U.S. at 315, 316 n.9, 318.

33. *Id.* at 314-19.

34. *Id.* at 318.

35. *Wheeler v. City of Pleasant Grove*, 833 F.2d 267, 271 (11th Cir. 1987).

36. *Lucas v. S.C. Coastal Council*, 505 U.S. 1003 (1992).

37. Even commentators who argued that *Lucas* established nothing new had to concede that it had synthesized and recompiled much of what had gone before. *E.g.*, Jerold S. Kayden, *The Lucas Case: Old Wine in Old Bottles*, 46 LAND USE L. & ZONING DIG. 9, 9 (1992).

38. *Lucas*, 505 U.S. at 1015.

39. *Id.* at 1017.

40. *Lucas v. S.C. Coastal Council*, 424 S.E.2d 484 (S.C. 1992). I note with some grim amusement that after fighting Mr. Lucas for years to prevent him from developing his land, once the state was forced to buy the lots from him, it put the lots on the market—for development. For a discussion of this disgraceful denouement, see GIDEON KANNER, *Not With a Bang, But a Giggle: The Settlement of the Lucas Case*, in TAKINGS: LAND-DEVELOPMENT CONDITIONS AND REGULATORY TAKINGS AFTER DOLAN AND LUCAS 308 (David L. Callies ed., 1996).

The upshot of these cases is that all takings require compensation. There is no need for further analysis. The analysis has already been done by scholars of contrasting political and/or jurisprudential beliefs. From his vantage point on the liberal side of academia, Professor Laurence Tribe read this case law as meaning that ". . . forcing someone to stop doing things with his property—telling him 'you can keep it, but you can't use it'—is at times indistinguishable, in ordinary terms, from grabbing it and handing it over to someone else."⁴¹ Professor Richard Epstein, viewing things from the opposite end of the ideological spectrum, agrees: "What stamps a government action as a taking . . . is what it does to the property rights of each individual who is subject to its actions: nothing more or less is relevant."⁴² Proceeding from the scholarly to the mundane, the idea that deprivation of the right to use property is a serious infringement of ownership may be found in even the most general of texts: ". . . if one is deprived of the use of his or her property, little but a barren title is left in his or her hands."⁴³

*B. A Seizure of the Right to Use
Property—Even Temporarily—Requires
Compensation*

The Fifth Amendment's just compensation guarantee is concerned not with the niceties of legal form, but with the practical impact of government actions on the owners of private property.⁴⁴

If a government agency were to condemn property temporarily for a passive use, as it does regularly (e.g., for a scenic easement), no one would seriously suggest that compensation should not be paid.⁴⁵ In like vein, when regulations have the same effect (of

41. LAURENCE H. TRIBE, AMERICAN CONSTITUTIONAL LAW 593 (2d ed. 1988).

42. RICHARD A. EPSTEIN, TAKINGS: PRIVATE PROPERTY AND THE POWER OF EMINENT DOMAIN 94 (1985).

43. 63C AM. JUR. 2D, Property § 3 at 69 (1997).

44. See *United States v. Dickinson*, 331 U.S. 745, 748 (1947) ("Constitution is 'intended to preserve practical and substantial rights, not to maintain theories.'"); *Hughes v. Washington*, 389 U.S. 290, 298 (1967) (Stewart, J., concurring) (emphasis added) ("the Constitution measures a taking of property not by what a State says, or by what it intends, but by what it *does*."); see also *Davis v. George B. Newton Coal Co.*, 267 U.S. 292, 302 (1925) ("The taking was for a public use. The incantation pronounced at the time is not of controlling importance; our primary concern is with the accomplishment."); *Yuba Goldfields, Inc. v. United States*, 723 F.2d 884, 889 (Fed. Cir. 1983).

45. See the Court's discussion in *First Eng. Evangelical Lutheran Church v. Cnty. of L.A.*, 482 U.S. 304, 318 (1987) (applying this direct condemnation concept to regulatory takings and showing the applicability to regulatory takings of the wartime condemnations of temporary use in *Kimball Laundry*. *Kimball Laundry Co. v. United States*, 338 U.S. 1 (1949); *United States v. Petty Motor Co.*, 327 U.S. 372 (1946); *United States v. Gen. Motors Corp.*, 323 U.S. 373 (1945).

denying owners the use of their land) through the nominal exercise of the police power, there is no functional difference between the two modes of government action.⁴⁶ Either way, the owners are deprived of the use and enjoyment of their property, and it is that deprivation, not the formal acquisition of title by the government, that is the mechanism of the taking.⁴⁷

Justice Brennan's *San Diego Gas* analysis also showed that insofar as the applicability of the Just Compensation Clause is concerned, there is no constitutional content in the temporariness of a taking. He aptly concluded that *all* takings are, in reality, temporary, because the government can always revoke a regulation or cease a physical invasion or surrender possession.⁴⁸

In *First English*, the Supreme Court directly faced the question of whether the length of time of a deprivation made any constitutional difference when determining whether a taking requires compensation. The three dissenters thought it did.⁴⁹ The other six, however, decided it did not.⁵⁰

Shortly thereafter, the Court of Appeals for the Federal Circuit explained (through Judge Jay Plager, who spent his formative years as a property professor) why temporary takings are, from a jurisprudential standpoint, the same as permanent takings:

Part of the difficulty here is the confusion that arises in the cases and commentaries over the use of the term “temporary taking.” The argument in *Agins [v. City of Tiburon]*, which was finally laid to rest in *First Lutheran Church*, was that a regulatory taking, unlike a physical taking, is by its nature “temporary.” This is because the government, upon being told the regulation was overly intrusive and therefore a taking (by whatever test), could rescind or amend the regulation.

It is equally true, however, that the government when it has taken property by physical occupation could subsequently decide to return the property to its owner, or otherwise release its interest in the property. Yet no one would argue that that would somehow absolve the government of its liability for a taking during the time the property was denied to the property owner. All takings are “temporary,” in the sense that the government can always

46. *San Diego Gas & Elec. Co. v. City of San Diego*, 450 U.S. 621, 652 (1981) (Brennan, J., dissenting).

47. *Gen. Motors*, 323 U.S. at 378; *Kirby Forest Indus., Inc. v. United States*, 467 U.S. 1, 14 (1984); *see also Hawaii Housing Auth. v. Midkiff*, 467 U.S. 229, 244 (1984).

48. *San Diego Gas & Elec. Co.*, 450 U.S. at 657, 659-66.

49. *First Eng.*, 482 U.S. at 322.

50. *Id.* at 318.

change its mind at a later time, and this is true whether the property interest taken is a possessory estate for years or a fee simple acquired through condemnation, or an easement of use by virtue of a regulation.⁵¹

In a recent takings case, Chief Justice Roberts put it a bit more colloquially, if less elegantly, noting that, “[a] bank robber might give the loot back, but he still robbed the bank.”⁵² That would seem to have eliminated the conclusion in *Tahoe-Sierra Preservation Council v. Tahoe Regional Planning Agency* that “a fee simple estate cannot be rendered valueless by a temporary prohibition on economic use, because the property will recover value as soon as the prohibition is lifted.”⁵³ Recovery of value is simply the equivalent of a bank robber returning the loot. As Justice Scalia pointed out, the “malefactor [should not get] the benefit of its malfeasance.”⁵⁴ Two decades earlier, the Court had concluded simply that “[e]lemental notions of fairness dictate that one who causes a loss should bear the loss.”⁵⁵

Even decades earlier than that, the Supreme Court had noted the unfairness that can occur “when the Government does not take [a property owner’s] entire interest, but by the form of its proceeding chops it into bits, of which it takes only what it wants, however few or minute, and leaves [the property owner] holding the remainder, which may be altogether useless to him . . .”⁵⁶ Indeed, as the Court concluded in *Lingle v. Chevron*, “total deprivation of beneficial use is, from the landowner’s point of view, the *equivalent of a physical appropriation*.”⁵⁷

Thus, the real question is whether a taking has occurred, and that depends on the impact of the governmental action on the ability of the landowner to make economically productive use of the land. Justice Holmes put it quite directly more than a century ago, saying: “[T]he question is what has the owner lost[?]”⁵⁸ As the Federal Circuit Court of Appeals put it, “[n]othing in the language of the Fifth Amendment compels a court to find a taking only when the

51. *Handler v. United States*, 952 F.2d 1364, 1376 (Fed. Cir. 1991); *see Agins v. City of Tiburon*, 447 U.S. 255 (1980).

52. *Knick v. Twp. of Scott*, 139 S. Ct. 2162, 2172 (2019).

53. *Tahoe-Sierra Pres. Council, Inc. v. Tahoe Reg’l Plan. Agency*, 535 U.S. 302, 331-32.

54. *Palazzolo v. Rhode Island*, 533 U.S. 606, 636-37 (2001) (Scalia, J., concurring).

55. *Owen v. Indep.*, 445 U.S. 622, 654 (1980).

56. *United States v. Gen. Motors Corp.*, 323 U.S. 373, 382 (1945).

57. *Lingle v. Chevron U.S.A. Inc.*, 544 U.S. 528, 539-40 (2005) (emphasis added) (quoting *Lucas v. S.C. Coastal Council*, 505 U.S. 1003, 1017 (1992)). Many decades earlier, the Court had concluded that “[c]onfiscation may result from a taking of the use of property without compensation as from the taking of the title.” *Chicago, Rock Island & Pac. Ry. Co. v. United States*, 284 U.S. 80, 96 (1931).

58. *Bos. Chamber of Com. v. Boston*, 217 U.S. 189, 195 (1910).

Government divests the total ownership of the property; the Fifth Amendment prohibits the uncompensated taking of private property without reference to the owner's remaining property interests.”⁵⁹

In *Lucas*, where the Court considered the Fifth Amendment implications of a South Carolina regulation that precluded all economically productive use of two subdivided residential parcels, the Court aptly noted “the practical equivalence in this setting of negative regulation and appropriation.”⁶⁰

In *City of Monterey v. Del Monte Dunes*, the Court upheld a jury's award of compensation for a temporary taking after a city repeatedly denied permission to develop houses on residentially zoned land.⁶¹ Although the Court acknowledged that it had not provided a “definitive statement of the elements of a claim for a temporary regulatory taking,”⁶² it upheld a judgment based on jury instructions drawn from cases dealing with permanent takings. In this more recent temporary taking case, the Court thereby reaffirmed the *San Diego Gas/First English* view that the essential underlying jurisprudence is the same for all takings.

The Supreme Court has frequently reverted to the property professors' “bundle of sticks” analogy in takings cases.⁶³ In *Loretto v. Teleprompter Manhattan CATV Corp.*, the Court concluded that even a minuscule physical taking required compensation because “the government does not simply take a single ‘strand’ from the ‘bundle’ of property rights: it chops through the bundle, taking a slice of every strand.”⁶⁴ There are no strands left for the owners to enjoy—unless one considers the joy of paying taxes a beneficial use of the land.⁶⁵

Thus, neither the mode nor duration of a taking is of constitutional moment. If the facts show that it is a taking, then compensation is mandatory.

59. *Fla. Rock Indus., Inc. v. United States*, 18 F.3d 1560, 1568 (Fed. Cir. 1994).

60. *Lucas v. S.C. Coastal Council*, 505 U.S. 1003, 1019.

61. *City of Monterey v. Del Monte Dunes*, 526 U.S. 687, 721-23 (1999).

62. *Id.* at 704.

63. *E.g.*, *Kaiser Aetna v. United States*, 444 U.S. 164, 176 (1979); *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 433 (1982); *U.S. v. Sec. Indus. Bank*, 459 U.S. 70, 76 (1982); *Ruckelshaus v. Monsanto Co.*, 467 U.S. 986, 1011 (1984); *Lucas v. S.C. Coastal Council*, 505 U.S. 1003, 1027 (1992); *Palazzolo v. Rhode Island*, 533 U.S. 606, 627 (2001); *Hodel v. Irving*, 481 U.S. 704, 716 (1987); *Nollan v. Cal. Coastal Comm'n*, 483 U.S. 825, 831 (1987); *Dolan v. Tigard*, 512 U.S. 374, 393 (1994); *Murr v. Wis.*, 137 S. Ct. 1933, 1952 (2017) (Roberts, C.J., dissenting); *Cedar Point Nursery v. Hassid*, 141 S. Ct. 2063, 2071 (2021); *see Berger, Protecting Property, supra* note 2.

64. *Loretto*, 458 U.S. 419, 435 (1982).

65. *Cf. Arverne Bay Constr. Co. v. Thatcher*, 278 N.Y. 222, 232 (Ct. App. 1938) (confiscation would at least relieve the owners of their tax burdens).

II. THE SUPREME COURT HAS MADE A HASH OF DEFINING A “TAKING” UNDER THE FIFTH AMENDMENT

Sometimes concepts that should be simple are transmogrified into dense webs of uncertainty. Taking property is one of them. We are talking about rules that should be so basic that most children are able to understand them. Distinguishing between the concepts “mine” and “not mine” is something that is supposed to occur in the preschool years. But, sometimes some of us forget those early playground lessons. The concept is easy: if it is “mine,” I get to play with it and you don’t, unless I approve. Professor Donald Kochan has compared the traditional definitions of rights and duties devised by Professor Wesley Newcomb Hohfeld with basic precepts of child psychology and found much commonality:

Sharing starts to seem more acceptable to a child when a child understands their reciprocal claims and obligations regarding owned things. In other words, we are more willing to share once we know three things: (1) we can get our things back; (2) we can set the terms and conditions of sharing; and (3) the sharee must accept the bitter with the sweet in sharing and abide by the owner’s terms if the sharee wishes to have the benefit of using, possessing, or accessing the property of another. *We are more willing to share when there are strong property norms, backed by the confidence generated by strong property rights enforcement mechanisms.*⁶⁶

The simplicity was explained in elegant fashion by Justice Brennan in his celebrated dissent in the *San Diego Gas* case, as shown above.⁶⁷ Justice Brennan’s focus was not on the technicalities by which government action impacted property, but on the reality of what the government action had done to the property owner’s ability to make rational use of the land. His focus was, as the Court’s ought to be, on the impact to the owner:

From the property owner’s point of view, it may matter little whether his land is condemned or flooded, or whether it is restricted by regulation to use in its natural state, if the effect in both cases is to deprive him of all beneficial use of it.⁶⁸

66. Donald J. Kochan, *I Share, Therefore It’s Mine*, 51 U. RICH. L. REV. 909, 924 (2017) (emphasis added).

67. See *supra* note 30 and accompanying text; *San Diego Gas & Elec. Co. v. San Diego*, 450 U.S. 621, 652 (Brennan, J., dissenting).

68. *Id.* at 652-53.

Shortly thereafter, a majority of the Court adopted Justice Brennan's philosophy as the Court's holding in *First English*.⁶⁹ There, the Court plainly held that the Constitution protects private property from all sorts of takings. Period.⁷⁰

And then it started to fall apart.

Don't take my word for it. Here is how the Supreme Court itself has evaluated its own performance:

In Justice Holmes' well-known, if less than self-defining, formulation, "while property may be regulated to a certain extent, if a regulation goes too far it will be recognized as a taking."⁷¹

The rub, of course, has been—and remains—how to discern how far is "too far."⁷²

[W]e have "generally eschewed" any set formula for determining how far is too far, choosing instead to engage in "essentially ad hoc factual inquiries."⁷³

Since [*Pennsylvania Coal v.] Mahon*, we have given some, but not too specific, guidance to courts confronted with deciding whether a particular government action goes too far and effects a regulatory taking.⁷⁴

Indeed, we still resist the temptation to adopt *per se* rules in our cases involving partial regulatory takings, preferring to examine "a number of factors" rather than a simple 'mathematically precise' formula.⁷⁵

Our polestar instead remains the principles set forth in *Penn Central* itself and our other cases that govern partial regulatory takings.⁷⁶

69. *First Eng. Evangelical Lutheran Church v. Cnty. of L.A.*, 482 U.S. 304 (1987).

70. *Id.* at 318-19.

71. *Palazzolo v. Rhode Island*, 533 U.S. 606, 617 (2001) (quoting *Pa. Coal Co. v. Mahon*, 260 U.S. 393, 415 (1922)).

72. *Lingle v. Chevron U.S.A., Inc.*, 544 U.S. 528, 538 (2005). Having summarized it that way, *Lingle* described the *Penn Central* factors as "storied but cryptic." *Id.* at 537 (adding yet more unhelpful verbiage to the stew the Supreme Court was concocting).

73. *Tahoe-Sierra Pres. Council v. Tahoe Reg'l Plan. Agency*, 535 U.S. 302, 326 (2002) (quoting *Lucas v. S.C. Coastal Council*, 505 U.S. 1003, 1005 (1992) which, in turn, quoted *Penn Cent. Transp. Co. v. City of N.Y.*, 438 U.S. 104, 124 (1978)).

74. *Palazzolo*, 533 U.S. at 617.

75. *Tahoe-Sierra*, 535 U.S. at 326.

76. *Id.* at 326 n. 23 (quoting with approval from *Palazzolo*, 533 U.S. at 633 (O'Connor, J., concurring)).

With respect, that is no way to run a railroad. One would think that after continuously confessing its failure to provide anything approaching useful guidance, the Supreme Court would have taken one of those cases (or granted certiorari in any of the scores of similar cases that followed thereafter)⁷⁷ and provided the guidance that it had concededly refrained from doing. It is simply unacceptable for our highest court to repeatedly say the equivalent of: Sorry—we have no helpful hints on how to approach this fundamental Constitutional issue.⁷⁸

Nearly 50 years down the road from *Penn Central*, and 100 years down the road from *Pennsylvania Coal v. Mahon*, it is time for less handwrapping and a bit of concrete assistance. As Justice Robert Jackson apocryphally put it, “We are not final because we are infallible, but we are infallible only because we are final.”⁷⁹

“Infallible” is hardly the word one would choose to evaluate the Supreme Court’s performance in this field. Professor Arvo Van Alstyne, described the pertinent decisional law as “largely characterized by confusing and incompatible results, often explained in conclusionary terminology, circular reasoning, and empty rhetoric.”⁸⁰ Even the Supreme Court has been forced to recognize this and has had to overrule some of its key takings cases—cases that had been cited many thousands of times as expressing settled, bedrock law.⁸¹

However, because the Court is concededly “final,” it is time for it, in the immortal words of W.C. Fields, to “take the bull by the tail and face the situation.”⁸²

77. See, e.g., Petition for a Writ of Certiorari at i-ii, *Smyth v. Conservation Comm'n of Falmouth*, 140 S. Ct. 667 (2019) (No. 19-223); Petition for a Writ of Certiorari at i, *Charles A. Pratt Constr. Co. v. Cal. Coastal Comm'n*, 555 U.S. 1171 (2009) (No. 08-668); see also, e.g., Petition for a Writ of Certiorari at i, *Colony Cove Props., LLC v. City of Carson*, 139 S. Ct. 917 (2019) (No. 18573); Brief Amicus Curiae of Ctr. for Const. Juris. in Support of Petitioners, *Kitsap All. of Prop. Owners v. Cent. Puget Sound Growth Mgmt. Hearings Bd.*, 566 U.S. 904 (2012) (No. 11-457); Petition for a Writ of Certiorari at i, *Rose Acre Farms, Inc. v. United States*, 559 U.S. 935 (2010) (No. 09-342); Brief in Opposition at 8, *Hsu v. Cnty. of Clark*, 544 U.S. 1056 (2005) (No. 04-1282).

78. For additional shortcomings of the Supreme Court’s application of *Penn Central*, see Berger, *Protecting Property*, *supra* note 2, at 31-35.

79. *Brown v. Allen*, 344 U.S. 443, 540 (1953) (Jackson, J., concurring); see Ruth Bader Ginsburg, *Tribute to Chief Justice William Hubbs Rehnquist*, 74 GEO. WASH. L. REV. 869, 870 (2006).

80. Arvo Van Alstyne, *Taking or Damaging by Police Power: The Search for Inverse Condemnation Criteria*, 44 S. CAL. L. REV. 1, 2 (1970).

81. See, e.g., *Williamson Cnty. Reg'l Plan. Agency v. Hamilton Bank*, 473 U.S. 172 (1985), *overruled by Knick v. Twp. of Scott*, 139 U.S. 2162 (2019); *Agins v. Tiburon*, 447 U.S. 255 (1980), *abrogated by Lingle v. Chevron U.S.A., Inc.*, 544 U.S. 528 (2005).

82. BRAINYQUOTE, https://www.brainyquote.com/quotes/w_c_fields_125388 (last visited Feb. 17, 2024).

III. *PENN CENTRAL IS A FAILED “POLESTAR”*

So, what would the Court see if it were to look directly into the hindquarters of the bull that it had by the tail? It would certainly not see a “polestar.” Classically, the polestar was the brightest light in the northern sky, something that sailors in the world before electronics could use to find their way.⁸³ Whatever it is, *Penn Central* is no polestar. It concededly fails to provide the guidance that a polestar is supposed to furnish. People seeking to follow it as some sort of guide are more likely than not going to end up running aground (or falling off the edge, if you are a flat-earther). As noted hereafter, convincing a court that a taking has occurred under the *Penn Central* standard is difficult, at best. Indeed, most such cases end in government victories.⁸⁴

Worse, the confusion almost seems to have been by design because the Court has acknowledged the problems and refused to address them.⁸⁵ Polestar? *Penn Central* has, in fact, become a laughingstock. That is why Justice Thomas concluded his recent dissent from denial of certiorari in a case that potentially provided the Supreme Court with a way out of the morass by saying:

Our current regulatory takings jurisprudence leaves much to be desired . . . The current doctrine is so vague and indeterminate that it invites unprincipled, subjective decision making dependent upon the decisionmaker . . . A know-it-when-you-see-it test is no good if one court sees it and another does not. Next year will mark a century since [*Pennsylvania Coal Co. v.*] *Mahon*, during which this Court for the most part has refrained from providing definitive rules. It is time to give more than just some, but not too specific guidance.⁸⁶

My opinion differs from Justice Thomas’s in only one respect. The Court has had many opportunities to “make clear when [a

83. See VOCABULARY.COM, <https://www.vocabulary.com/dictionary/polestar> (last visited Feb. 17, 2024).

84. Not all, to be sure, but most. See *infra* note 89, and accompanying text. It, of course, cannot explain all the losses, but I have suggested in the past that at least some are due to untutored plaintiffs’ counsel simply thinking that a takings claim is a nifty idea and tacking it onto an otherwise ordinary complaint. To put it bluntly, those who don’t know the field should stay out of it: “friends don’t let friends file takings claims.” See Michael M. Berger, *Strong and Informed Advocacy Can Shape the Law: A Personal Journey*, 4 BRIGHAM-KANNER PROP. RTS. CONF. J. 1, 2-3 (2015) (criticizing takings claims based on forcing exotic dancers to stay four feet away from customers, castrating dogs, precluding a murderer from collecting on his victim’s life insurance policy, and the like).

85. See *supra* notes 71-76 and accompanying text.

86. *Bridge Aina Le’ a v. Haw. Land Use Comm’n.*, 141 S. Ct. 731, 731-32 (2021) (Thomas, J., dissenting) (citations omitted).

taking] occurs.”⁸⁷ Having demonstrated that it is either incapable of providing that clarity or that it simply has no interest in doing so, it is time for the Court to step back. What it needs to do is to accept Justice Holmes’s general conclusion that when government action goes “too far”, it is a taking, and then turn the question of deciding whether specific action has failed that broad test up to a jury that is presented with all the evidence surrounding the situation. That is the core of our common law tradition, and it will work quite well in these specific circumstances. Factual decision by a jury is our polestar.

IV. STOP CHOPPING TAKINGS INTO PIECES AND PUTTING THEM INTO DIFFERENT BOXES

A serious part of the problem is the Supreme Court’s love of pigeonholes, and its consequent insistence on placing different “kinds” of takings in different cubbies: regulatory takings, physical takings, permanent takings, temporary takings, trespassory takings, conditions, exactions, floodings, overflights, and so on. And then pretending that they are substantively different things. The truth is that the multiple little boxes into which the court segregates takings are a substantial part of the problem. A claim that government action fits in one box will likely be met with the defense (or worse, a holding by a court) that the action actually belongs in a different box and is subject to a different kind of analysis.⁸⁸

The solution is clear: get rid of the boxes. Simplify the process. Treat all government impositions on property owners as potential takings and have a jury judge them by common sense standards. Only then will the promise of the Fifth Amendment to guarantee just compensation when property is taken for public use be fulfilled.⁸⁹ After all, the Fifth Amendment does not differentiate among different flavors of takings, providing compensation for some but not for others. Nor does it command any sort of Solomonic baby slicing. It simply says, “. . . nor shall private property be taken for

87. *Id.*

88. I am mindful of Yogi Berra’s aphorism, “when you come to the fork in the road, take it.” Edward H. Cooper et al., *The Jurisprudence of Yogi Berra*, 46 EMORY L.J. 697, 741 (1997). In our context, I take that to mean that trying to stuff your takings case into a specific cubby is an invitation to having some court at some point down the road (after the expenditure of a monarchical sum in time, effort, and cold cash) tell you that you chose the wrong box. Why should you have to choose at all when you come to that fork in the road? Why not just allege that a taking occurred, present all the evidence to the jury, and let the jury determine the rest?

89. I must confess that this is not my first rodeo. I have touched on this subject in the recent past and this paper builds on that earlier work. See Berger, *Protecting Property*, *supra* note 2, at 35-44; Michael M. Berger, *Whither Regulatory Takings?*, 51 URB. LAW. 171, 179-82 (2021).

public use without just compensation.”⁹⁰ Period. The rest starts to look like Talmudic disputation.

Government need not be overly concerned that all sorts of minor infringements will be brought to court. Takings litigation is neither cheap nor easy. Only property owners with substantial losses and lawyers willing to invest their time and effort into extensive litigation will bring such cases to court.⁹¹

In a graphic moment, the Ninth Circuit Court of Appeals observed, “If we attempt to cut a condemnation proceeding into slices, it bleeds.”⁹² I have never been quite sure what the court had in mind when it penned those words, but I am happy to run with them here. One of the fundamental problems with takings law is the judiciary’s penchant for slicing, dicing, and categorizing things. Too much blood. Not enough clarity.

V. LET JUDGES BE JUDGES AND JURIES BE JURIES

Speaking of boxes, here is a pair worth keeping separate: judges and juries. This brings us to the heart of my proposed solution. It may be a heretical thing to say, but judges do not have a monopoly on wisdom. A genius part of the common law system is the creation of the jury. When confronted with conflicting piles of evidence, the jury has been like a heat-seeking missile in determining where the truth lies.⁹³ More than that, as Thomas Jefferson put it, the jury trial represents “the only anchor, [as] yet imagined by man, by which a government can be held to the principles of its constitution.”⁹⁴ Professor Akhil Amar summarized that “[n]o idea was more central to our Bill of Rights . . . than the idea of the jury.”⁹⁵

So, here is my thought: let the judges keep their hands off the factual question of whether a taking has occurred. Let us return to Justice Holmes’s concept that a taking occurs when government action goes “too far.” Then, rather than troubling the judiciary with

90. U.S. CONST. amend. V.

91. For examinations of takings cases showing that only significant cases go to judgment, see, for example, Carol Necole Brown & Dwight H. Merriam, *On the Twenty-Fifth Anniversary of Lucas: Making or Breaking the Takings Claim*, 102 IOWA L. REV. 1847 (2016); Daniel R. Mandelker, *Litigating Land Use Cases in Federal Court: A Substantive Due Process Primer*, 55 REAL PROP., TR. & EST. L.J. 69, 96-97 (2020) (“a takings claim is almost impossible to win”).

92. *Phillips v. United States*, 243 F.2d 1, 2 (9th Cir. 1957).

93. When I went to law school many decades ago, my contracts class was taught by a crusty old adjunct professor who was also a trial judge. His response to any issue that came up regarding the ultimate facts in a case was, “the jury always knows!”

94. Thomas Jefferson, *Letter from Thomas Jefferson to Thomas Paine*, July 11, 1789, <https://fjfa.org/library-and-resources/library/historic/letter-jefferson-to-paine.html>.

95. Akhil Reed Amar, *Reinventing Juries: Ten Suggested Reforms*, 28 U.C. DAVIS L. REV. 1169, 1169 (1995).

analyzing things like the *Penn Central* “factors” and trying to divine what the Supreme Court may have meant, let’s do away with ambiguous legal “factors” and let the jury simply analyze the evidence and decide whether the government went “too far.”⁹⁶

Juries are fully capable of taking on this role, as the jury showed in *Del Monte Dunes*. That jury examined a fairly complex set of facts covering many years and various kinds of government actions and concluded that the constitutional line had been crossed. On review, both the Ninth Circuit and the Supreme Court approved its work.

The judiciary needs to streamline things and return to basics. As Justice Robert Jackson explained, it is never too late to “surrende[r] former views to a better considered position.”⁹⁷ The judiciary also needs to back off a bit from getting its hands dirty with the facts and deciding the merits of takings cases. I suggest two changes. First, no more boxes. Put all challenges to governmental actions that (by whatever definition)⁹⁸ “take” private property in the single box marked “potential takings” and evaluate them on their merits. Second, back away and leave the evaluation of the underlying factual merits to the body best suited to such evaluations: the jury.⁹⁹ Give them their due. Many judges are fine at evaluating *legal* questions. That’s what we were all taught how to do in law school. But the answer to the question of whether a specific action has “gone too far” and “taken” private property for public use is a quintessentially factual question.¹⁰⁰ The judicial system has spent centuries honing the jury as the ultimate fact finder.¹⁰¹ More than that, judges often resent being asked to review

96. I am pleased to see that judges have begun speaking out in favor of revitalizing the jury system. See Pierre Bergeron, *A Judge’s Pitch to Revive the Jury Trial*, LAW360 (Mar. 7, 2024), <https://www.law360.com/articles/1704879?scroll=1&related=1>; William Young, *The Missing American Jury*, LAW360 (Mar. 7, 2024), <https://www.law360.com/articles/865278?scroll=1&related=1>.

97. *McGrath v. Kristensen*, 340 U.S. 162, 178 (1950) (Jackson, J., concurring).

98. And let’s use all the definitions that have arisen so far and others that may arise in the future.

99. I have suggested elsewhere that deciding whether government action has gone “too far” is the kind of fact-finding best left to juries, not judges. I still believe that. See Berger, *Whither Regulatory Takings?*, *supra* note 89, at 197-201.

100. This may be the one thing that *Penn Central* got right: most cases need to be decided individually on their own facts. *Penn Cent. Transp. Co. v. City of N.Y.*, 438 U.S. 104, 124 (1978); *see also Ruckelshaus v. Monsanto Co.*, 467 U.S. 986, 1005 (1984); *McDougal v. Cnty. of Imperial*, 942 F.2d. 668, 680 (9th Cir. 1992). Whether something goes “too far” is generally a jury question. *See, e.g., Vulcan Materials Co. v. City of Tehuacana*, 369 F.3d 882 (5th Cir. 2004); *United N.Y. Sandy Hook Pilots Ass’n v. Rodermund Indus., Inc.*, 394 F.2d 65 (3d Cir. 1968); *Green v. Sanitary Scale Co.*, 431 F.2d 371 (3d Cir. 1970); *Pa. R. Co. v. Forstall*, 159 F. 893 (2d Cir. 1908).

101. As Professor Gideon Kanner put it, “appellate courts . . . lack the time, the litigational tools, and the institutional competence to make them. The usual pattern in American law, therefore, is that ad hoc factual decisions are made by juries (duly instructed on the applicable law), or by judges acting as triers of fact.” Kanner, *supra* note 3, at 726-27 (footnotes omitted).

land use planning issues.¹⁰² As a matter of Seventh Amendment interpretation, the Supreme Court plainly held that juries are capable of deciding the supposedly “legal” question of whether a taking has occurred, rather than restricting them to the supposedly “factual” question of the quantum of compensation due.¹⁰³ Let the jury do its job.¹⁰⁴

A final note about juries. Some will demur to this idea, in this context, on the ground that property owners in takings cases are not entitled to juries except to determine the amount of compensation after the court has determined that a taking occurred.

They would be wrong. The idea, although popular in some judicial circles, is contrary to *Del Monte Dunes* as well as the common law of England at the time the Bill of Rights was adopted.¹⁰⁵ In a nutshell, *Del Monte Dunes* (through both Justice Kennedy’s majority opinion and Justice Scalia’s concurring opinion) showed that the kind of litigation typified by takings cases would have been tried to an English jury in 1791, and such litigation continues to be tried to a jury in England today. The one thing that *Del Monte Dunes* got wrong was its conclusion that the English courts did not use juries in takings cases (called “compulsory purchase” over there). The British Court of Appeal case of *De Keyser’s Royal Hotel v. The King*¹⁰⁶ discusses British legal history as far as trial by jury in compulsory purchase cases is concerned, and concludes that, as of 1708 (i.e., before our Revolution and adoption of the Bill of Rights), such cases were tried to juries. All parties to that case agreed.

102. Hoehne v. Cnty. of San Benito, 870 F.2d 529, 532 (9th Cir. 1989) (not the “Grand Mufti” of land use litigation); Dodd v. Hood River Cnty., 136 F.3d 1219, 1230 (9th Cir. 1998); Murphy v. New Milford Zoning Comm’n, 402 F.3d 342 (2d Cir. 2005); River Park Inc. v. City of Highland Park, 23 F.3d 164, 165 (7th Cir. 1994); *see* Hynes v. Pasco Cnty., 801 F.2d 1269, 1270 (11th Cir. 1986) (“not . . . a zoning review board”); Polenze v. Parrott, 883 F.2d 551, 558 (7th Cir. 1989); Raskiewicz v. Town of New Bos., 754 F.2d 38, 44 (1st Cir. 1985); *see also* Vill. of Belle Terre v. Boraas, 416 U.S. 1, 13 (1974) (Marshall, J., dissenting) (“Our role is not and should not be to sit as a zoning board of appeals.”). Refer also to the caustic commentary of Judge Posner in *Coniston Corp. v. Vill. of Hoffman Estates*, 844 F.2d 461, 467 (7th Cir. 1988) (stating that the case was “a garden-variety zoning dispute dressed up in the trappings of constitutional law.”); *see generally* Steven J. Eagle, *Penn Central and Its Reluctant Muftis*, 66 BAYLOR L. REV. 1 (2014).

103. *City of Monterey v. Del Monte Dunes*, 526 U.S. 687 (1999).

104. I still bridle at the thought of what happened in *Bridge Aina Le’ā v. State of Haw.*, where the jury found a taking and the trial judge upheld that finding and then the Court of Appeals re-weighed the evidence, re-evaluated the credibility of witnesses *whom it neither saw nor heard*, and concluded there was no taking at all. *Bridge Aina Le’ā v. State of Haw.*, 950 F.3d 610, 617, 630 (9th Cir. 2020). For fuller discussion, see Berger, *Whither Regulatory Takings?* *supra* note 89.

105. *See* Gideon Kanner, *Our Eminent Right to a Jury Trial*, 49 URB. L. 607 (2017); Gideon Kanner, *Our Eminent Right to a Jury*, 3Y009 ALI-CLE 61 (2017) (Westlaw).

106. *Att’y Gen. v. De Keyser’s Royal Hotel* [1919] 2 Ch. 197 (C.A.) 222.

VI. CONCLUSION

We need to stop kidding ourselves. *Penn Central* isn't working and it can't be fixed. The way to put all of us—judges, regulators, and property owners alike—out of the misery of trying to deal with it is for the Supreme Court to bite the bullet and eliminate it. It took hard looks at *Agins* and *Williamson County*, and substantially overruled them. It can do the same with *Penn Central*. The best way to fix the situation is to simply trust juries to do what they have historically done in all sorts of substantive fields: examine all the evidence and determine whether government action has gone so far as to have taken property in the constitutional sense.

SEAS THE DAY: FINDING THE TREASURES OF RATIFYING THE LAW OF THE SEA CONVENTION

KEVIN GRIFFIN*

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I. INTRODUCTION

The world community is sailing onward to a prosperous future, leaving the United States in its wake. Our nation is not falling behind because we are being outcompeted. We are falling behind because we chose not to work with the rest of the world. Fifty years ago, in 1973, the world met to establish how all humankind would share the seas.¹ This convention, named the United Nations Convention on the Law of the Sea (“UNCLOS III”), boasted over 300 articles (not including the 10+ annexes which describe extra

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1. JOSH EAGLE & SHI-LING HSU, OCEAN AND COASTAL RESOURCES LAW 10-11 (Wolters Kluwer ed., 3d ed. 2020).

programs and have separate articles within them) and was an incredibly comprehensive agreement to share and preserve the seas and its resources.²

After an arduous decade of drafting the convention alongside the rest of the world, the United States elected not to ratify it. Ignoring the time and resources spent on the initial discussion, the United States' failure to ratify only acts to the detriment of its national interests and of the environment. Technological advancements in mining technology will wreak havoc on the marine environment absent a mutually coercive force to keep it in check.³ This coercive force cannot be mutual without U.S. ratification of UNCLOS III.⁴

U.S. national interests will only be served through ratification. Ratification would protect our interest in freely navigating the high seas without doing it alone or risking the lives of U.S. sailors.⁵ Furthermore, without ratification, the U.S. is powerless to prevent the actions of bad actors from outside the convention.⁶ The United States is also losing out on a vital opportunity to shape the mining regulations by which the world will be bound by choosing to be silent.⁷ Lastly, the Nation will never have the “home court advantage” in any international seabed disputes if we do not ratify UNCLOS III.⁸

The International Seabed Authority (“ISA”) is not the monster under the seabed that opponents to ratification fear it to be. It is not an Orwellian superpower ready to destroy American democracy by preventing the destruction of the commons.⁹ As a member state, the United States could direct where cost-sharing sharing provision money goes to keep it out of the hands of bad actors.¹⁰ The ISA’s authority to set environmental regulations will not be an open door for environmental groups to force the United States to protect its natural resources above all other interests.¹¹ The ISA will only prevent the destruction of the commons. America would be free to destroy its natural resources as it sees fit, so long as doing so does not interfere with other nations or the international commons.

2. *See generally*, United Nations Convention on the Law of the Sea, Dec. 10, 1982, 1833 U.N.T.S. 397 [hereinafter UNCLOS III].

3. *See infra* Section IV(A).

4. *Id.*

5. *See infra* Section IV(B)(i).

6. *See infra* Section IV(B)(ii).

7. *See infra* Section IV(B)(iii).

8. *See infra* Section IV(B)(iv).

9. Donald Rumsfeld, delegate to UNCLOS III during the Reagan administration, referred to the ISA as “Orwellian”. *See* The Law of the Sea Convention: Hearing on Treaty Doc. 103-39 Before the S. Comm. on Foreign Rel., 112th Cong. 176 (2012).

10. *Id.*

11. *See infra* Section IV(C)(ii).

The United States must “seas” the chance to ratify UNCLOS III. This Note will begin with the history of sea regulation, starting with the age of exploration and pushing forward to United States regulations that became an international model for sea regulation. After that, this Note will discuss sections of UNCLOS III relevant to jurisdiction over areas of the sea and deep seabed mining. Next, this Note will dive into why the United States must ratify UNCLOS III by analyzing the environmental interests contemplated by the treaty and our national interests. Lastly, this Note will show why UNCLOS III and the ISA are *not* monsters under the seabed and how their existence will protect both the environment and U.S. national interests.

II. HISTORY OF SEA REGULATION

UNCLOS III’s creation followed two earlier conventions, UNCLOS I and II.¹² The convention’s logic is rooted in much older international custom, though.¹³ This section starts by describing what “custom” is in general terms, then it will discuss the two underlying principles that guided international ocean and coastal law for years: *Mare Liberum* and the United States’ early marine resource management regulations.

A. Custom

The United States Supreme Court has accepted the importance of customary international law.¹⁴ During the Spanish-American War, the United States captured two Spanish fishing vessels and took them from Cuba to Key West as prizes of war.¹⁵ It was a long-held international custom that fishing vessels could not be taken as prizes of war.¹⁶ The Court held that these vessels were exempt as prizes, by stating:

Undoubtedly, no single nation can change the law of the sea. That law is of universal obligation, and no statute of one or two nations can create obligations for the world.¹⁷

12. See EAGLE & HSU, *supra* note 1, at 10. UNCLOS I set forth some excellent first steps at regulating the seas, but ultimately did not establish any meaningful limitations, just goals. *Id.* See United Nations Convention on the Law of the Sea, Apr. 29, 1958, 1844 U.N.T.S. 146 [hereinafter UNCLOS I]. UNCLOS II’s goal was to set a formal length of the territorial sea and fishing catch limitations, but the convention could not do either. See EAGLE & HSU, *supra* note 1, at 10.

13. *Id.*

14. See *The Paquete Habana*, 175 U.S. 677 (1900).

15. *Id.* at 678.

16. *Id.* at 698.

17. *Id.* at 711 (internal quotation marks omitted).

Custom—in general—is the result of steady and widespread practice by nations on the international scale.¹⁸ *Mare Liberum* and the United States’ early regulations regarding marine resource management are the two sets of custom that UNCLOS III drew on when setting its provisions.

B. Mare Liberum

International ocean and coastal regulation started with Christopher Columbus and the Catholic Church.¹⁹ In the 1400s, Spain and Portugal had a dispute regarding who would control the New World.²⁰ The nations asked the Pope to decide the issue.²¹ Pope Alexander VI split the New World in half between Spain and Portugal, with a commensurate split over control of the seas.²² Understandably, the other nations clamoring for territory in the New World were unhappy with the church’s arbitrary division.

Dutch jurist Hugo Grotius rebelled against the idea that Spain and Portugal should “own” the sea and proposed a new theory—no one nation should have total control.²³ Grotius wrote *Mare Liberum* (translated to “free seas”),²⁴ a treatise asserting that the seas could not be regulated due to their sheer size.²⁵ Grotius believed the sea was like the air; therefore, it could not be regulated:

The Air belongs to this class of citizens for two reasons. First, it is not susceptible of occupation; and second, its common use is destined for all men. For those same reasons the seas are common to all, because it is so limitless that it cannot be the possession of any one and because it is adapted for use by all.²⁶

Grotius’s view became the custom in international law, with a single exception.²⁷ Coastal nations would control as far as their

18. *Customary International Law*, CORNELL LEGAL INFORM. INST. (Dec. 18, 2023), https://www.law.cornell.edu/wex/customary_international_law.

19. EAGLE & HSU, *supra* note 1, at 5.

20. *Id.*

21. *Id.* at 6.

22. *Id.*

23. *Id.*

24. See HUGO GROTIUS, THE FREEDOM OF THE SEAS 28 (Ralph Van Deman Magoffin trans., James Brown Scott ed., Oxford University Press 1916) (1608).

25. *Id.* at 38.

26. *Id.*

27. EAGLE & HSU, *supra* note 1, at 6.

cannons could shoot, originally three nautical miles (“NM”) and extending to twelve NM once cannon technology advanced.²⁸

Grotius’s ideas commanded public opinion for hundreds of years, but the world grew, learned, and changed as time passed. His ideas remained important as the world navigated regulations of the seas. Everything changed when the United States started regulating its coastal seas. United States regulations made even bigger waves than Grotius in influencing international custom.

C. Regulations in the United States

History demonstrates that the United States has been a trendsetter in seas regulations since at least the 1940s. Two examples of U.S. leadership in this field are the Truman Proclamation on the Continental Shelf and the United States’ fish management legislation.

In the 1940s, President Truman declared the seabed “appurtenant” to the United States (in other words, those areas of the seabed that are a part of the U.S. continental shelf) to be within the United States’ jurisdiction.²⁹ His rationale was that the desire for the subsoil minerals was realizable with the advent of new mining technologies, and so proclaiming the United States’ jurisdiction over those minerals was essential to preempting international competition over those minerals.³⁰ The proclamation was groundbreaking (literally) to international law. Disputes over seabed ownership vanished as the world adopted Truman’s view.³¹ This view was codified into the Convention on the Continental Shelf, part of UNCLOS I.³²

The United States charted a new course in ocean regulation through fisheries management as well. In 1976, the United States’ Magnuson-Stevens Fishing Conservation and Management Act (“FCMA”) declared jurisdiction over fisheries up to 200 NM.³³ The FCMA became the guidepost for the Exclusive Economic Zone (“EEZ”) delineated by UNCLOS III, which stated that all nations can manage their fisheries and other living resources up to 200 NM.³⁴

28. *Id.* at 6-7. A nautical mile is 1.15 statutory miles (i.e., the miles on your car) and is different to help make navigation easier by using the latitude and longitude system, a vital system for the navigating mariner.

29. Proclamation No. 2667, 10 Fed. Reg. 12,303 (Sept. 28, 1945).

30. *Id.*

31. EAGLE & HSU, *supra* note 1, at 9.

32. *Id.* See Convention on the Continental Shelf, Apr. 10, 1964, 15 U.S.T. 471, 499 U.N.T.S. 311.

33. EAGLE & HSU, *supra* note 1, at 82.

34. UNCLOS III, *supra* note 2, at art. 57, art. 61.

These examples show the power the United States historically had in pre-UNCLOS III seas regulations. Its desire to utilize the natural resources near its shores, coupled with new technology, drove Grotius's ideas and centuries of customary law to the side. This power did not go away during the drafting of UNCLOS III.

III. UNCLOS III

UNCLOS III was a massive undertaking on the international stage. Over 160 state actors had to describe their desires for seas regulations.³⁵ The whole convention did not devolve into chaos because of a new voting procedure. Nations could only vote “up” the whole convention or vote “down” the whole convention.³⁶ This procedural rule was a brilliant play by the convention leadership, as it would prevent holdups in ratification by nations who disliked one small thing in one particular provision.

The United States continued its tradition of being a trendsetter at the convention.³⁷ The nation had vast interests in the seas.³⁸ As such, “every provision of UNCLOS III had to have the assent of the United States.”³⁹ The U.S. agreed to them all, except one: the Deep Seabed Mining Provision.⁴⁰ This provision established the ISA as the regulatory body for deep seabed mining activities beyond the EEZ, and set forth the new international standards for exploration and exploitation of mineral resources in the deep seabed.⁴¹ This provision would prove to be a massive barrier to U.S. ratification of UNCLOS III.

In lieu of providing an in-depth analysis of every single provision presented during the drafting of UNCLOS III, this Note will only highlight the provisions relevant to my argument for United States ratification: the deep seabed and the jurisdictional bounds. The deep seabed provisions set out how and when nations can mine by establishing an international authority over the deep seabed resources. The jurisdictional bounds formalized the rights and obligations nations owe one another in areas near their shores.

35. EAGLE & HSU, *supra* note 1, at 10-11.

36. *Id.* at 11. To avoid confusion: A “Convention is both a meeting of countries and the resulting agreement among them.” *Id.* at 9.

37. *Id.*; *see supra* Section II(C).

38. These interests included shipping, energy, military, and fishing. *Id.*

39. *Id.*

40. EAGLE & HSU, *supra* note 1, at 11. *See* UNCLOS III, *supra* note 2, at Part XI.

41. *See* UNCLOS III, *supra* note 2, at Part XI.

A. Jurisdictional Bounds

UNCLOS III hit the ground running by doing what UNCLOS II could not: it established the size of the zones surrounding coastal nations: territorial seas, the contiguous zone, and the EEZ.⁴² The Territorial Sea goes up to twelve NM, and the Contiguous Zone is the next twelve NM (totaling 24 NM).⁴³

The EEZ was new to these accords, so, naturally, it is where the issues started to pop up. An EEZ extends from twelve NM to 200 NM.⁴⁴ The EEZ establishes a complex set of rights and obligations for coastal and noncoastal nations.⁴⁵ These areas do not overlap; if that were the case, Miami would be in the EEZ of the Bahamas. Instead, the distance beyond the Contiguous Zone of each nation is cut in half and given equally to each nation if the EEZs would overlap due to the proximity of the two nations.⁴⁶ In their EEZs, coastal nations have many rights and obligations, including rights to explore, conserve, and manage living and nonliving natural resources.⁴⁷ Foreign states retain their rights to navigation, overflight, and lay submarine cables and pipes within another nation's EEZ.⁴⁸

Additionally, within the EEZ, a coastal state may build and regulate artificial islands or other offshore structures, over which it retains jurisdiction.⁴⁹ Coastal states can also manage safety zones around the artificial structure to ensure navigational safety.⁵⁰ These islands are not *intended* to have territorial seas around them, but some nations are using artificial islands to extend their claims over the sea, such as China in the South China Sea.⁵¹ Actions like this threaten the United States' interests at sea: if these nations continue to claim more area for themselves, there will be fewer areas for the United States to mine.⁵²

With an area as large as the sea, it is no wonder jurisdiction over it has become a contested issue. Individual nations' desires to expand their spheres of influence are why the world needs UNCLOS

42. *Id.* at 12-13. This chart shows the various bounds described by UNCLOS III.

43. UNCLOS III, *supra* note 2, at art. 3, 33(2).

44. EAGLE & HSU, *supra* note 1, at 23.

45. *Id.* at 24.

46. *Id.* at 23.

47. UNCLOS III, *supra* note 2, at art. 56(1)(a).

48. *Id.* at art. 58(1).

49. *Id.* at art. 60(1)-(2).

50. *Id.* at art. 60(4).

51. UNCLOS III, *supra* note 2, at art. 60(8); Adam W. Kohl, China's Artificial Island Building Campaign in the South China Sea: Implications for the Reform of the United Nations Convention on the Law of the Sea, 122 DICK. L. REV. 917, 923 (2018) (discussing island building and the implications for UNCLOS III jurisdictional bounds and the 200 NM EEZ).

52. See *infra* Section IV(B).

III. Its restrictions on what areas nations can claim strike a balance between Grotius's *Mare Liberum* and the regulations needed to preserve the seas for all humankind. Past 200 NM, the seas are as open as possible to prevent exploitation of the commons.⁵³ What happens when the minerals a nation wants to mine are beyond its EEZ? That's where the deep seabed provisions of UNCLOS III step in to prevent depletion of resources common to all humankind.

B. The Deep Seabed

The deep seabed is the area past the continental shelf.⁵⁴ The Deep Seabed Mining Provision, regulating mining in areas beyond the continental shelf, is the provision which led President Ronald Reagan to decline to ratify back in 1982.⁵⁵ This section explores what this section of UNCLOS III entails.

Dissenters to ratification cite the cost-sharing requirements of the deep seabed mining provisions as anti-free market and a detriment to U.S. national interests.⁵⁶ The convention also establishes the ISA to control mineral resources of the seabed.⁵⁷ The ISA is fully autonomous and helps ensure that marine resources and extraction activities are used for the common benefit of humankind.⁵⁸ The "Area" they manage is 54% of the entire global sea floor.⁵⁹

The ISA is made of five main organs: The Assembly (which houses the finance committee), The Council, The Secretariat, The Enterprise, and the Legal and Technical Commission.⁶⁰ The Council controls the approval of contracts to mine the deep seabed, approves activities within the Area, selects candidates for the secretary general, and assumes additional responsibilities as mining projects commence.⁶¹ The Council selects its thirty-six

53. For a discussion of the concept of "the commons," see Hardin, *infra* note 71.

54. EAGLE & HSU, *supra* note 1, at 27.

55. See, e.g., Ronald Reagan, Statement on United States Ocean Policy (March 10, 1983), <https://www.reaganlibrary.gov/archives/speech/statement-united-states-oceans-policy>.

56. Alfred P. Rubin, *Monster from the Deep: Return of UNCLOS*, NAT'L INT. (Sept. 1, 1994), <https://nationalinterest.org/article/monster-from-the-deep-return-of-unclos-995>.

57. *About ISA*, INT'L SEABED AUTH., <https://www.isa.org.jm/about-isa/> (last visited March 5, 2023).

58. *Id.*

59. *Id.* The Authority named the seabed under the High Seas "The Area". Creative naming, Authority . . .

60. *Organs of the International Seabed Authority*, INT'L SEABED AUTH., <https://www.isa.org.jm/organs/> (last visited May 5, 2023) (describing the various groups that make up the ISA).

61. *Structure and Mandate of the Council*, INT'L SEABED AUTH., <https://www.isa.org.jm/structure-and-mandate/> (last visited May 5, 2023) (describing the role the Council plays in deep sea governance).

members in a set of brackets: four from members that consume or import more than two-percent of commodities from the Area, and another four from members who are among those who made the largest investments for activities in the Area.⁶² The finance committee sets the ISA budget and manages the cost-sharing distributions.⁶³ The Assembly is the group that elects members of the Council and sets the budget for the Finance committee to administer.⁶⁴ All signatory nations are members of the Assembly.⁶⁵

The cost-sharing provisions establish a baseline for how contributors to mineral exploration and extractions are paid.⁶⁶ The goals of this provision are to ensure optimum revenues for the ISA, attract investors, ensure equality, and provide incentives for exploration.⁶⁷ The ISA has been working on this equitable sharing plan since 2018 but has not come up with a solid plan, yet.⁶⁸ It has been testing three different formulas to determine the most equitable distribution.⁶⁹

No one loves cutting through red tape to do anything, and people enjoy giving away money even less, but the bureaucratic process is necessary to ensure sustainable use of deep seabed mineral resources. This provision cannot be the barrier to ratification any longer; it is time to “seas” the chance to ratify the convention.

IV. “SEAS-ING” THE CHANCE TO RATIFY

The United States should ratify the Law of the Sea Convention for two reasons: the mitigation of environmental impacts from better mining technology and its national interests in navigation and mining. These two principles are discussed in turn; then this Note will show why the ISA will not undermine and control U.S. interests at sea.

62. *The Council*, INT'L SEABED AUTH., <https://www.isa.org.jm/organs/the-council/> (last visited May 5, 2023) (describing the composition of the Council). There are five groups total, each with its own election criteria, but Group A & B are more relevant to this paper.

63. *The Finance Committee*, INT'L SEABED AUTH., <https://www.isa.org.jm/organs/the-finance-committee/> (last visited May 5, 2023) (Describing the composition and role of the finance committee).

64. *The Assembly*, INT'L SEABED AUTH., <https://www.isa.org.jm/organs/the-assembly/> (last visited May 5, 2023) (describing the composition and role of the Assembly).

65. *Id.*

66. UNCLOS III, *supra* note 2, at Annex III art. 13.

67. *Id.*

68. Int'l Seabed Auth., Policy Brief, *Equitable Sharing of Financial and Other Economic Benefits from Deep-Sea Mining*, at 1 (2022) https://www.isa.org.jm/wp-content/uploads/2023/04/policy_briefBenefit_sharing_01_2022.pdf [hereinafter Policy Brief].

69. *Id.* at 3.

A. Technology & The Commons “Com-Ocean”

The ISA said it best: the Area is “for the benefit of humankind as a whole”.⁷⁰ The sad truth is that, for some people, the only benefit they care about is how far they can pad their wallets. Without someone to ensure that *all* humankind gets access to deep seabed resources, these people can exploit resources and destroy the environment. This section will explain why the seas and the seabed are a “commons.” Next, it will use the FCMA as an example of how proper regulations can guard against the tragedy of the commons in deep seabed resources. Finally, this Section will show why United States ratification is necessary to ensure that mutual coercion stays mutual.

1. Are the Seas a Commons?

The tragedy of the commons is a classic problem in environmental law, formulated by ecologist Garrett Hardin.⁷¹ In short, if too many people plunder a resource owned by a community, it will be depleted because everyone will want the maximum benefit from the commons.⁷² The solution, Hardin supposes, is creating a mutually agreed-upon coercion.⁷³

The seas are the ultimate example of a commons.⁷⁴ World community members want to take all the fish, oil, and minerals that their ships can carry from a pool of resources shared by the entire international community. Left unchecked by a coercive force, the seas will be drained of all these resources and the environment will suffer. UNCLOS III is the mutually agreed upon coercion that Hardin envisioned. The environmental provisions are a restriction on free seas but, absent them, individual nations will continue to rob the seas. The United States must sign on to UNCLOS III to prevent wasteful use of the commons through mutual coercion.

2. Guarding from Technology

Deep sea minerals and fish stocks would both feel the tragedy’s effects from different groups clamoring for their resource. These effects would only be exacerbated by technological improvements. Back in the early stages of sea regulation, mining tools consisted of pickaxes, the fastest way you could travel over the water was by sail,

70. *About ISA*, *supra* note 57.

71. See Garrett Hardin, *The Tragedy of the Commons*, 162 SCI. 1243 (1968).

72. *Id.*

73. *Id.* at 1247.

74. *Id.* at 1244.

and the mightiest military weapon was a musket. Since then, there have been some major improvements to technology, like big mining rigs, nuclear-powered vessels, and military drones. At the same time, commercial fishing technology improved, prompting the passage of the FCMA in the United States. The FCMA serves as an example of how an overarching regulatory scheme can protect these resources in the face of technological advancement.

In 1965, Commercial fishermen kept 14,945,800 pounds of snapper from the Gulf of Mexico fishery.⁷⁵ That nearly 15-million-pound catch was more than double the catch in 1950.⁷⁶ This rise in snapper landings coincides with improvements in fishing technology. Diesel engines, drums in longline fishing, and power blocks started supplementing other fishing tackle in the 1940s and 1950s.⁷⁷ Technological advancements made it easier to pull up more fish, making it easier to overfish. Technological advances continued into the 1970s, with the declassification of sonar technology.⁷⁸ Sonar makes it easier for fishermen to find schools of fish.⁷⁹ Interestingly, the data shows a decrease in gulf snapper landings from 1965-1980 despite the continued technological advancement.⁸⁰ The decrease in landings matches an increase in regulation: both successful domestic laws and failed international agreements.⁸¹ These laws protect fish stocks from being depleted by having regional fisheries management councils monitor fish stocks and dictate how many fish in a species fishermen may take out in a given year.⁸²

UNCLOS III does not delegate jurisdiction over all fishing upon the high seas. However, it does delegate authority over mining in the Area to the ISA.⁸³ Years ago, mining the Area was a dream, but now that nations are close to having the power to do it, the Area has become another commons. ISA regulations mirror what the FCMA

75. *NOAA Gulf Snapper Data*, NAT'L OCEANIC & ATMOSPHERIC ADMIN., <https://www.fisheries.noaa.gov/foss/f?p=215:200:11222476092269:Mail::::> (last visited Apr. 28, 2024) (Commercial selected and Recreational unselected; All Years; NMFS Regions, Click “Gulf;” select all species of snapper; Click “Totals by Year/Region;” and Click “Run Report”) [hereinafter *NOAA Gulf Snapper Data*].

76. *Id.*

77. *See generally, History of Commercial Fishing*, ENCYC. BRITANNICA <https://www.britannica.com/technology/commercial-fishing/History-of-commercial-fishing> (last visited Apr. 8, 2023).

78. *Sea Floor Mapping*, NAT'L OCEANIC & ATMOSPHERIC ADMIN., https://oceanexplorer.noaa.gov/explorations/lewis_clark01/background/seafloormapping/seafloormapping.html (last visited Apr. 14, 2024).

79. EAGLE & HSU, *supra* note 1, at 76.

80. *NOAA Gulf Snapper Data*, *supra* note 75.

81. *Id.* at 10-11 (UNCLOS I: 1958, UNCLOS II: 1960, UNCLOS III: 1982); *id.* at 82 (FCMA passed in 1976).

82. *See* EAGLE & HSU, *supra* note 1, at 83-84.

83. UNCLOS III, *supra* note 2, at art. 157(1).

did for managing fish stocks in the U.S. Mining technologies will only continue to improve in the foreseeable future, and a comprehensive regulatory scheme will guard against overuse of seabed resources. By signing on to UNCLOS III, the U.S. would show that it is willing to follow the same rules as everyone else when it comes to taking from the commons. Mutual coercion must be mutual, and without the United States, this mutual coercion cannot exist.

3. Mutual Coercion Must be Mutual

UNCLOS III has sweeping environmental provisions. The treaty grants the ISA the power to adopt regulations to preserve the marine environment.⁸⁴ These regulations include provisions to control pollution, dredging, drilling, construction, and to protect natural resources.⁸⁵ The ISA's authority to control the protection of these resources does not extend to a nation's natural resources, i.e., those in their continental shelves and EEZs.⁸⁶

UNCLOS III does not stand in the way of all U.S. interests at sea. It is just a limited form of Hardin's mutual coercion.⁸⁷ Nations are allowed to exploit *their* resources, following their environmental policies; they just cannot destroy the international commons haphazardly for their benefit. This limited intrusion on the United States' ability to destroy the environment is why UNCLOS III is necessary. Without UNCLOS III, nations could compete with one another until they could not compete anymore—as there would be no resources left for which to compete.

What would happen if the United States continued not to ratify UNCLOS III? Hardin's coercion is mutually agreed upon, not unilateral. The United States, as a powerful force in the international community, could ignore the environmental provisions without any fear of significant repercussions in the international courts. Our potential flippancy with these rules may convince other nations that they can also ignore them. The United States should not be the reason this ultimate example of a commons is eradicated.

In sum, technology will continue to advance forever. Absent clear rules for all nations to abide by, the tragedy of the commons will continue to become worse. Mutual coercion needs to be mutual. The United States' continuing failure to ratify UNCLOS III is not mutual coercion. As a result, the regulations of the ISA will fail, and

84. UNCLOS III, *supra* note 2, at art. 145.

85. *Id.*

86. UNCLOS III, *supra* note 2, at art. 193, 56.

87. See Hardin, *supra* note 71, at 1247.

the free-for-all race for deep sea resources will begin. There will only be one loser in this race—the environment.

B. “En-Shore-ing” U.S. National Interests

Failure to ratify UNCLOS III has only stood in the way of the United States’ national interests for the past four decades. The United States needs to ratify the Convention to represent itself better on the world stage. This section will explore the navigation interests, preventing bad actor interests, representation interests, and international dispute interests impacted by UNCLOS III.

1. Navigation

Freedom of navigation is a custom in international law and is codified by UNCLOS III.⁸⁸ United States forces have inserted themselves to preserve the custom through the Freedom of Navigation program.⁸⁹ The United States does not have to be a lone soldier in the fight to protect its rights—the U.S. can leverage UNCLOS III to ensure its rights are protected.

The Department of Defense supports UNCLOS III ratification because it protects the United States’ navigation rights. The Office of the Judge Advocate for the U.S. Indo-Pacific Command released a memo highlighting the importance of UNCLOS III ratification, stating that “becoming a Party to UNCLOS would help preserve the Department of Defense’s ability to move forces on, over, and under the world’s oceans, *whenever and wherever needed*.⁹⁰

Ratification would allow the U.S. Navy to turn to a clear expression of our rights instead of an amorphous navigation custom to defend our navigation. Nations of the world must work together to enforce these rights, so when it ratifies UNCLOS III, the United States will not need to unilaterally enforce the treaty anymore.

Because the U.S. has not ratified UNCLOS III, it has implemented The Freedom of Navigation program to assert U.S. navigation rights and discourage other states from operating inconsistently with the navigation provisions of UNCLOS III.⁹¹ The

88. GROTIUS, *supra* note 24, at 8; UNCLOS III, *supra* note 2, at art. 87(1)(a).

89. See generally, Office of the Staff J. Advoc., U.S. Indo-Pacific Command, *The U.S. Position on the U.N. Convention on the Law of the Sea (UNCLOS)*, 97 INT’L L. STUD. 81 (2021) [hereinafter *The U.S. Position on the U.N. Convention on the Law of the Sea*].

90. See generally *id.* at 81-87 (discussing the stance of various government groups on UNCLOS) (emphasis added).

91. Captain George V. Galdorisi, *Treaty at a Crossroads*, U.S. NAVAL INST. (July 2007) <https://www.usni.org/magazines/proceedings/2007/july/treaty-crossroads>; see generally *U.S. Freedom of Navigation Program*, *supra* note 89 (discussing the specifics of the Freedom of Navigation program).

program enforces what is laid out in the UNCLOS III treaty: ensure the security of the world's oceans and give all nations access to the seas.⁹² This expensive program operates through threats of force instead of through a solid body of law that already exists.⁹³

Enforcement through force threatens the lives of U.S. sailors. In 2021, the Freedom of Navigation program found that twenty-six nations were acting outside the UNCLOS III program, expanding their jurisdiction illegally over the seas.⁹⁴ Some of these nations are friendly with the United States, like Japan, while others are less friendly, like China.⁹⁵ The current U.S. approach of enforcement through force risks unnecessary conflict with these nations.

Using force risks the lives of U.S. sailors unnecessarily. Ratifying UNCLOS III gives the United States an extra avenue to exhaust when defending navigational rights: the diplomatic option. Using the diplomatic option will protect U.S. sailors because the nation can resolve conflicts over navigation without deploying the fleet, which may provoke conflict from foreign actors. If the diplomatic option fails, we will still need the fleet, but attempting peaceful negotiations reduces the probability that force will be needed to protect U.S. interests. In addition to protecting sailors' lives, the U.S. can share the burden of protecting navigation rights with the rest of the world by ratifying UNCLOS III.

While not a party to UNCLOS III, the U.S. is still enforcing the rights and restrictions it sets forth. Our government is carrying the burden of enforcing this treaty to protect our customary right to navigate. Ratification will lock in our codified right and make the United States an ocean policy leader once again. As a leader, the United States can reduce the strain on the Freedom of Navigation program by sharing the responsibility of preserving the freedom to navigate with all signatories.

Certainly, pointing to a signature on a document would not be sufficient to protect our rights in a vacuum. However, ratification will send the world a signal that the United States is not going to play around with its rights anymore. When the time comes to enforce the treaty, the U.S. will do so with the backing of codified international law. It is time for the United States to come into the fold and carry the burden with the aid of the international community. Ratification of UNCLOS III is a must to secure U.S. navigational freedom.

92. *U.S. Freedom of Navigation Program*, *supra* note 89, at 71 (discussing the specifics of the Freedom of Navigation program).

93. Galdorisi, *supra* note 91.

94. *U.S. Freedom of Navigation Program*, *supra* note 89, at 72.

95. *Id.* at 73.

2. Stopping Bad Actors

Chinese interests are currently adversely affecting American interests at sea. China's actions fall into two categories: flagrant violations of the UNCLOS III artificial island provisions and presence on the ISA. U.S. ratification will push back against China's growing sphere of influence and guard U.S. interests. Each of these categories will be tackled in turn throughout this section.

China, an UNCLOS III signatory, has thwarted the Convention for years. At best, China has misinterpreted the EEZ provision on artificial islands for years and, at worst, is willfully ignoring it. China, Taiwan, the Philippines, Vietnam, and Malaysia all have claims to the South China Sea, and many lay overlapping claims to various natural islands.⁹⁶ This territory was relatively unimportant to these nations until they found minerals in the deep seabed.⁹⁷ Since 1969, all five nations have set up artificial islands to extract these resources.⁹⁸ China has gone a step further: they are creating these islands to establish an EEZ over the South China Sea and claiming these artificially created islands gain the same rights as naturally created islands.⁹⁹ This jurisdictional extension will cause issues with U.S. Navigation and mining throughout the region.

Chinese actions highlight the importance of the tragedy of the commons in seas regulations. By acting against the mutual coercion set up by UNCLOS III, China causes a drain on the resources in the South China Sea, destroying this commons. Mutual coercion needs to be mutual, so U.S. ratification of UNCLOS III will allow the United States to ensure that China and all bad actor states are mutually coerced by the treaty.

The South China Sea is not the only place China is extending its influence. China is influencing the ISA as well, through its presence in the ISA's various organs. It has been a member of the Council in two types of seats: as a significant contributor to the development of the deep seabed and as a significant consumer/importer.¹⁰⁰ Additionally, China is always a member of the Finance Committee.¹⁰¹ If the United States continues to give the ISA the cold shoulder, then China will continue to have a powerful voice that can

96. Kohl, *supra* note 51, at 921.

97. *Id.*

98. *Id.*

99. *Id.* at 923.

100. Int'l Seabed Auth., *supra* note 62 (click "Composition of Council 1996-2026") (showing that China's seats changed in 2005, it was a major investor from 1996-2005, and a major importer from 2005-present).

101. *Members of the Finance Committee*, INT'L SEABED AUTH., https://www.isa.org.jm/wp-content/uploads/2022/07/FinComMembersList_1997-2021.pdf (last visited Apr. 28, 2024) (listing all the members of the ISA Finance Committee).

direct where the cost-sharing provisions will go. China, as a world superpower on the Finance Committee, could define the equitable sharing criteria called for in UNCLOS III.¹⁰² In fact, China has the third-highest share received in the proposed geometric mean formula.¹⁰³ If the U.S. ratifies UNCLOS III, it can push back on China's influence on the committees.

As members of the committee, U.S. delegates can direct funds back into its own hands and create incentives to keep this money out of its enemy's hands. Otherwise, under a Chinese-influenced finance committee, it might be equitable to send money to these bad actors that dissenters fear will misappropriate it and work against U.S. interests. China's expanding influence needs to be checked. If the United States ratifies UNCLOS III, it would be able to enter the ISA as a member and weed out the bad actors within it.

3. Representation

The ISA is debating the specifics of deep seabed mining, but only signatories to UNCLOS III can participate in the talks.¹⁰⁴ The United States is losing its voice because it failed to sign on to the convention. The United States has always been a powerful force when dictating the law of the sea. The EEZ came from our Fisheries Management Statute.¹⁰⁵ The Continental Shelf claims came from President Truman.¹⁰⁶ The nation is losing an opportunity to shape the seas. These regulations could be the chance for the United States to shape UNCLOS III to match our policies. If it had a voice in the negotiations, U.S. representatives could throw their weight around like when the nation claimed the continental shelf and the EEZ and like they did during the drafting of UNCLOS III itself; instead, it must sit passively by and let other nations make regulations that benefit them and could harm the U.S.

This lack of representation strikes at the very core of American ideals. In the late 1770s, the nation went to war against the foreign controller who taxed us without representation. Today, the United States is willfully silencing itself and allowing a foreign entity to act without the nation's consent. This silence will only act against U.S. interests. Ratifying UNCLOS III today would be the same as

102. UNCLOS III, *supra* note 2, at art. 82(4).

103. Policy Brief, *supra* note 68, at 5. China had the second highest distribution in a previous plan, as well. *Id.*

104. Jordan Wolman, *The world is set to debate seabed mining regulations, but the U.S. will be on the outside looking in*, POLITICO (Mar. 22, 2022), <https://www.politico.com/news/2022/03/22/seabed-mining-regulations-00019005>.

105. See *supra* Section II(C).

106. *Id.*

picking up a musket in 1776: creating an avenue for U.S. voices to be heard.

4. International Disputes

The international community would likely disfavor U.S. attempts to mine in the open seas absent ratification. It will look like the world community is playing by the rules when it comes to mining by jumping through the ISA's hoops to get approval. When the U.S begins to mine, without the ISA's approval process, it will look like it is exploiting a shared resource that all these nations want. When someone acts outside the mutual coercion of the commons, the members who agree to the rules will want to hold them accountable. For example, the United States prosecutes bank robbers and tax evaders every day because they decide not to be bound by this coercion.¹⁰⁷ The world community, in turn, may turn on the U.S. for "robbing the bank."

Suppose the United States were to get into a seabed mining dispute. In that case, it could sue parties of UNCLOS III and the ISA as a state enterprise at the Seabed Dispute Chamber ("Chamber").¹⁰⁸ Parties to the convention *do* get more avenues of recourse against more groups, but putting those aside, the simple ability to sue may not be enough to give the United States equal footing in the Chamber's considerations.¹⁰⁹ The United States, an influential international entity, will be arguing from the outside of UNCLOS III. Despite its strength, it would still be an outsider. The Chamber may be more inclined to rule in favor of an UNCLOS III party rather than a foreign force threatening its authority. Furthermore, when subjected to this tribunal's rules and procedures during suit, the United States will again be bound by UNCLOS III's rules and regulations without having a voice in their implementation.¹¹⁰

U.S. interests will only be served by ratifying UNCLOS III. Right now, the nation is playing without a home court advantage in international disputes over its actions at sea. The best way to ensure U.S. interests at sea is to come into the fold and ratify UNCLOS III.

107. Hardin, *supra* note 71, at 1247. He uses the bank robbing and tax evasion example in his treatise.

108. UNCLOS III, *supra* note 2, at art. 187(c).

109. *Id.* at art. 187.

110. See *supra* Section IV(B)(iii).

C. There Are No Monsters Under the Seabed

Objectors' arguments against ratification center around fears of an overbearing authority forcing compliance upon the United States. The main vessels for these arguments are the cost-sharing and environmental provisions. Detractors fear these provisions will put extra strain on the United States' interests and backdoor environmental regulations. This "boogeyman" argument against UNCLOS III misinterprets the treaty text and ignores the environmental benefits the United States will gain by ratifying.

1. More Money, No Problems

UNCLOS III's cost-sharing provisions do not need to be why the United States fails to ratify the convention. They are one of the first reasons cited when the United States chose not to ratify.¹¹¹ The Senate Committee on Foreign Relations held hearings in June 2012 regarding ratification.¹¹² Donald Rumsfeld, former secretary of Defense and representative of the United States at UNCLOS III during the Reagan administration, spoke at the hearing. He stated the following as reasons not to ratify,

The treaty creates a United Nations-style body called the 'International Seabed Authority.' 'The Authority,' as U.N. bureaucrats call it in Orwellian shorthand, would be involved in all commercial activity such as mining and oil and gas production in international waters.¹¹³

Rumsfeld also asserts that royalties of seabed mining flowing through a committee without oversight would be detrimental to U.S. entities because of the lack of control that the United States would have over this cashflow.¹¹⁴ This is because the ISA could pay the funds collected to cost-sharing programs to nations that work contrary to U.S. national security interests, such as countries that sponsor terrorism.¹¹⁵

These concerns ignore the history of the convention and the modern world. The ISA can seem like a monster under the seabed, but this is not the case. When the United States ratifies UNCLOS

¹¹¹ *Statement on United States Actions Concerning the Conference on the Law of the Sea* (July 9, 1982), <https://www.reaganlibrary.gov/archives/speech/statement-united-states-actions-concerning-conference-law-sea>.

¹¹² See *The Law of the Sea Convention: Hearing on Treaty Doc. 103-39 Before the S. Comm. on Foreign Rel.*, 112th Cong. 176 (2012).

¹¹³ *Id.* (statement of Donald Rumsfeld, Sec'y of Def.).

¹¹⁴ *Id.*

¹¹⁵ *Id.*

III, it will still be a superpower—a superpower who has been an innovator in sea regulations since even before the UNCLOS I treaty.¹¹⁶ A superpower that led the UNCLOS III convention up until it decided not to ratify the most comprehensive attempt at regulating the seas because of one provision that the then-current administration did not like.

Cashflow uncertainty from the cost-sharing provisions is a significant problem, but that problem is solved by one of the biggest issues the convention solves: the tragedy of the commons. Money reaped from these benefits would be a part of the commons; it is a resource common to all members of UNCLOS III. Controlling this commons, like the rest of the Area, falls to the ISA.¹¹⁷ If the United States were a party, then it would have a strong voice to say where that money goes.

The idea of bad actors in corrupt regimes abusing the funds is terrifying, but this is not a strictly UNCLOS III issue. The idea of foreign aid misappropriation by corrupt leaders is a problem throughout international relations law.¹¹⁸ Professor Fernando Tesón argues that if someone objects to intervention on these grounds, then they should either be less of a pessimist or object to all international actions (like aid or war) because someone may act against the will of the country offering aid.¹¹⁹

The foreign aid problem should not be the reason the U.S. has no voice in seas regulations. The problem of foreign aid misappropriation is endemic to all international law. Curing the disease requires intervention at its source, not by treating a symptom alone. Great legal thinkers should be working towards fixing the perversion of foreign aid, not standing in the way of a treaty that will preserve a benefit for all humankind.

2. Backdooring Environmental Regulations

Critics also fear that nations will try to control one another's environmental regulations through UNCLOS III. This fear is unfounded. The convention is exactly the mutual coercion that Hardin calls for and furthermore these "control" mechanisms do not force legislation but prevent destruction of the commons.

Keeping one another from destroying the commons is not backdooring environmental policy. The Public Policy Center believes that environmental groups are rejoicing because they can

116. See *supra* Section II(C).

117. See *The Finance Committee*, INT'L SEABED AUTH., *supra* note 63.

118. Fernando Tesón & Bas van der Vossen, *Debating Humanitarian Intervention: Should We Try to Save Strangers?* 129-30 (Oxford Univ. Press ed. 2017).

119. *Id.* at 130-31.

now use international laws as a vessel for change.¹²⁰ They also say that requiring member states to abide by the convention's terms is backdooring:

Ireland sought ITLOS's [The International Tribunal for the Law of the Sea] help in forcing the United Kingdom to abandon its planned opening of the Sellafield MOX plant, a nuclear fuel reprocessing plant in northern eastern England, arguing that it would contribute to pollution of the North Sea.¹²¹

The UNCLOS III provisions are explicit. Nations can do what they want within their borders, but do not let it affect other states:

States shall take all measures necessary to ensure that activities under their jurisdiction or control are so conducted as not to cause damage by pollution *to other States and their environment*, and that pollution arising from incidents or activities under their jurisdiction or control *does not spread beyond the areas where they exercise sovereign rights* in accordance with this Convention.¹²²

Dissenters who fear other nations controlling U.S. environmental regulations do not understand the convention. Nations may destroy their land all they want, but UNCLOS III protects the commons for all humankind. Other nations cannot come out from under your bed and force you to protect the environment, just prevent you from destroying the one common to us all.

UNCLOS III will not subject the United States to an oppressive foreign regime trying to take its hard-earned minerals, money, or force it to preserve its environment. As a party to UNCLOS III, the U.S. would be too powerful to oppress. Once a member, the U.S. will be back to trend-setting the law of the sea, like it did with the continental shelf and EEZ.¹²³ By signing on, the United States would work towards the preservation of the commons—it will not blindly walk into coercion by other states. United States interests need not fear UNCLOS III and the ISA.

120. See David Ridenour, *Ratification of the Law of the Sea Treaty: A Not-So-Innocent Passage*, NAT'L POL'Y ANALYSIS #542 (Aug. 1, 2006) <https://nationalcenter.org/ncppr/2006/08/01/ratification-of-the-law-of-the-sea-treaty-a-not-so-innocent-passage-by-david-ridenour/>.

121. *Id.*

122. UNCLOS III, *supra* note 2, at art. 194(2) (emphasis added).

123. See *supra* Section II(C).

v. CONCLUSION

The ratification argument comes down to two main points. First, technology exacerbates the tragedy of the commons issue. Preserving the commons requires mutual coercion of all members who can draw from it. This coercion cannot be mutual without the United States. Second, remaining on the sidelines will only continue to hurt the United States. Its “cold shoulder” approach to seas regulations has gone on for too long. Hiding from the alleged “monster under the seabed” cannot be the United States’ policy any longer. It is time to “seas” the opportunity to ratify the third United Nations Convention on the Law of the Sea.

**DEPOSING A TIGER KING:
HOW THE BIG CAT PUBLIC SAFETY ACT IS CHANGING
THE LEGAL FRAMEWORK OF PRIVATE PET
OWNERSHIP & COMMERCIAL EXHIBITION
OF EXOTIC SPECIES**

ASHLEY LANDWERLEN

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I. INTRODUCTION

In the spring of 2020, the world was hit with an unprecedented pandemic, sequestering families and individuals to their homes. Then, in the weeks following the COVID-19 quarantine mandate, another contagion of sorts swept the nation in the form of a Netflix true crime docuseries, *Tiger King: Murder, Mayhem, and Madness*.¹

The series follows the life of big cat breeder and then-owner and operator of the Oklahoma-based Greater Wynnewood Exotic Animal Park (“G.W. Zoo”), Joseph Maldonado-Passage, professionally known as Joe Exotic—the self-proclaimed “Tiger King.”²

The documentary sheds light on the interconnected society of roadside zoos, exotic pet breeders, dealers, collectors, and keepers in America.³ Animal rights activist Carole Baskin, the founder and CEO of Big Cat Rescue, an animal sanctuary formally located in Tampa, Florida, accuses the Tiger King of animal abuse and exploitation via his tiger cub petting programs.⁴ The documentary recounts the intense rivalry between Exotic and Baskin, including his hiring of a hitman to silence her advocacy to end private ownership and breeding of big cats in the U.S.⁵

Ultimately, a federal grand jury found Exotic guilty of two

1. TIGER KING: MURDER, MAYHEM, AND MADNESS (Netflix 2020) (hereinafter TIGER KING); *see* Todd Spangler, ‘Tiger King’ Nabbed Over 34 Million U.S. Viewers in First 10 Days, Nielsen Says (EXCLUSIVE), VARIETY (Apr. 8, 2020), <https://variety.com/2020/digital/news/tiger-king-nielsen-viewership-data-stranger-things-1234573602/>.

2. TIGER KING, *supra* note 1.

3. *Id.*

4. *Id.*; *see also* United States v. Maldonado-Passage, 4 F.4th 1097, 1099-1100 (10th Cir. 2021).

5. *See* Maldonado-Passage, 4 F.4th at 1100.

counts of murder-for-hire and nineteen counts of wildlife crimes, including violation of the Lacey Act by falsifying wildlife records and of the Endangered Species Act (“ESA”) by personally killing five tigers and selling tigers interstate.⁶ Thereafter, Exotic was sentenced to twenty-two years in federal prison, which was reduced by one year on appeal.⁷

By exposing the dark underworld of roadside zoos to millions of viewers, the *Tiger King* documentary stimulated political will to address the inhumane captive big cat management practices that have come to be associated with private pet ownership and commercial roadside exhibition.⁸ Thus, following a decade of legislative work, the bipartisan Big Cat Public Safety Act (“BCPSA”) stands as a landmark piece of federal legislation.⁹ The BCPSA ends private pet ownership and breeding of lions, tigers, leopards, cheetahs, jaguars, cougars, or any hybrid of such species (i.e., “big cats”) and prohibits exhibitors from allowing the public to make direct contact with a big cat, including a cub.¹⁰ Nevertheless, given that its scope is limited to species of big cats, this Note advances the proposition that the BCPSA provides a workable three-pillar framework to strengthen legal protections for other similarly situated captive exotic species common to private pet ownership and commercial roadside exhibition, such as the gray wolf and American alligator.

This Note is divided into four parts: Part I explores how the minimum standards, limited scope, and lack of enforcement of the Animal Welfare Act (“AWA”) result in vast differences in animal welfare, care, and management among commercial exhibitors, breeders, and private pet owners of exotic species. While the terms “exotic species” or “exotic animal” do not have a set legal meaning, for this Note, the terms refer to a wild animal or one that is more unusual or rare than domesticated pets like dogs or cats. Part II explores how the BCPSA’s strategic amendment of the Lacey Act (versus the AWA) strengthens federal wildlife protection laws, including the Captive Wildlife Safety Act (“CWSA”) and the ESA. Part III provides an analysis of the BCPSA’s tripartite framework. Part IV anticipates a changing legal landscape of captive exotic

6. *Id.* at 1101-02.

7. *Id.* at 1108.

8. See *TIGER KING*, *supra* note 1; RECKLESS TIGER CUB PETTING ZOO: THE HUMANE SOCIETY OF THE UNITED STATES INVESTIGATES GW EXOTIC ANIMAL PARK, HUMANE SOC’Y OF THE U.S., <https://www.humanesociety.org/sites/default/files/docs/investigative-report-gw-exotic-animal-park.pdf>; Spangler, *supra* note 1.

9. See Emily Brooks, *Bill restricting big cat ownership made famous by ‘Tiger King’ heads to Biden’s desk*, THE HILL (Dec. 6, 2022), <https://thehill.com/homenews/senate/3764378-bill-restricting-big-cat-ownership-made-famous-by-tiger-king-heads-to-bidens-desk/>.

10. 16 U.S.C. §§ 3372(e)(1), 3371(h); 50 C.F.R. § 14.252.

animal ownership, breeding, management, and public display by applying the Act's framework to private pet ownership and commercial exhibition of the gray wolf and American alligator.

II. UP AHEAD, NEXT EXIT: AMERICA'S UNACCREDITED "ROADSIDE" ZOOS

Drive along a U.S. highway, and you will likely encounter a billboard advertising a small and often remote wildlife tourist attraction promising its visitors memorable encounters to see, feed, touch, or play with the world's most exotic animals. Similar to the G.W. Zoo featured in the *Tiger King*, these unaccredited and for-profit privately-owned wildlife menageries, colloquially known as roadside zoos, have gained increasing attention concerning claims of dangerous public interactions, unlawful wildlife trafficking, severe animal neglect and cruelty, and the use of inhumane and unsustainable surplus breeding practices.¹¹

A. The Animal Welfare Act: Inadequate Federal Oversight of Captive Animals

On the federal level, the AWA sets the minimum standards governing the humane care, housing, treatment, handling, sale, and transport of captive animals as defined by the Act.¹² The AWA provides broad protections for animals bred for commercial sale (e.g., animal breeders and dealers, except for retail pet stores),¹³ exhibition (e.g., zoos, aquariums, circuses, educational programs),¹⁴ research,¹⁵ or commercial transport.¹⁶ The AWA applies to warm-blooded animals common to zoological parks and aquariums such as

11. See, e.g., HUMANE SOC'Y OF THE U.S., *supra* note 8 (revealing tiger cubs were punched, dragged, hit, and whipped during "training" at the G.W. Zoo. Visitors, including children, were bitten, scratched and knocked down by tiger cubs, some of whom were too mature for public handling or photo sessions); Wayne Pacelle, *HSUS Undercover Investigations at Roadside Zoos in Virginia, Oklahoma Reveal Severe Abuse*, HUFFPOST (Jan. 22, 2015), https://www.huffpost.com/entry/hsus-undercover-investiga_b_6527062 (describing roadside zoo owners who cut corners and exploited animals, particularly in cub breeding and cub photo-op programs); Rachel Fobar, *USDA accused of ignoring animal welfare violations in favor of business interests*, NAT'L GEOGRAPHIC (Oct. 13, 2021), <https://www.nationalgeographic.com/animals/article/usda-accused-of-ignoring-animal-welfare-for-business-interests> (stating that a USDA official inspection record of California-based Monterey Zoo, formerly known as Wild Things Animal Rentals, Inc., made no mention of an internal memo by two USDA inspectors reporting the zoo's possible infractions of the AWA).

12. See 7 U.S.C. §§ 2131-2156; ELENI BICKELL, CONG. RSCH. SERV., R47179, THE ANIMAL WELFARE ACT: BACKGROUND AND SELECTED ISSUES 4 (2023).

13. 7 U.S.C. § 2132(f).

14. *Id.* § 2132(h).

15. *Id.* § 2132(e).

16. *Id.* § 2132(i)-(j).

big cats, wolves, bears, great apes, monkeys, and marine mammals.¹⁷ However, the AWA excludes cold-blooded vertebrate animals (i.e., fish, reptiles, and amphibians), invertebrate animals (e.g., crustaceans), birds, mice, and rats used in research, horses not used in research, and farm animals used for food or fiber.¹⁸

The AWA requires a valid U.S. Department of Agriculture (“USDA”) license to operate a business involving animals as defined by the Act; this applies to persons or entities categorized as commercial breeders (Class A licensees), dealers (Class B licensees), or exhibitors (Class C licensees).¹⁹ Under the USDA, the Animal and Plant Health Inspection Service (“APHIS”) administers enforcement of the AWA by conducting unannounced compliance inspections.²⁰ Failure to correct non-compliance identified during an inspection may result in warnings, animal confiscation, fines, cease-and-desist orders, license suspension, license revocation, or criminal prosecution.²¹

*B. Not All Zoos are Created Equal:
Unaccredited Roadside Zoos Versus Accredited Zoos*

Despite the AWA’s commercial licensure and inspection requirements, not all USDA Class C exhibitors of captive exotic animals are created equal.²² The minimum standards set by the Act, its accompanying regulations, and a demonstrated lack of enforcement by APHIS are often criticized as being insufficient to protect exotic animals common to public display.²³ As a result, the regulatory inadequacies of the AWA, coupled with the inconsistent strength and scope of state animal welfare and cruelty laws, create significant discrepancies in the management practices utilized among the nation’s captive exotic animal population.²⁴ These discrepancies become evident when comparing the quality of animal

17. See *id.* § 2132(g).

18. See *id.*

19. *Id.* § 2134; 9 C.F.R. § 2.1(a)(1) (2023); 9 C.F.R. § 1.1 (2023).

20. 7 U.S.C. § 2147; 9 C.F.R. § 2.3 (2023); BICKELL, *supra* note 12, at 8.

21. 7 U.S.C. § 2149.

22. See Kailer Riedman et al., *Does Accreditation by the Association of Zoos and Aquariums Correlate with Animal Welfare Act Compliance?*, 26 J. APPLIED ANIMAL WELFARE SCI. 685, 685-92 (2022); Morgane Tidière et al., *Survival improvements of marine mammals in zoological institutions mirror historical advances in human longevity*, 290 PROC. ROYAL SOC’Y B. 2009, 6-7 (2023).

23. See, e.g., BICKELL, *supra* note 12, at 10-12; Justin Marceau, *How the Animal Welfare Act Harms Animals*, 69 HASTINGS L.J. 925, 943 (2018); Leslie Rudloff, *Failure to Launch: The Lack of Implementation and Enforcement of the Animal Welfare Act*, 67 SYRACUSE L. REV. 173, 182-84; Letter from Mike Quigley et al., Members of Congress, to Kevin Shea, USDA Admin. (Apr. 27, 2020), <https://awionline.org/sites/default/files/uploads/documents/WA-TigerKing-SignOnLetter>.

24. See Riedman et al., *supra* note 22, at 685-92.

care and management administered by unaccredited versus accredited zoos.²⁵

1. The Truth Behind the Selfie: Unaccredited Zoos & the Animal Welfare Impacts of Roadside Cub Petting & Photo-Op Programs

There are an estimated 3,000 unaccredited roadside zoos in forty-four U.S. states.²⁶ Given the lack of resources and professional expertise at unaccredited facilities, animals kept at such facilities often are confined to small and overcrowded conflict-prone cages, live in unsanitary conditions, are provided inadequate food, water, and veterinary care, lack mental stimulation, are subject to inhumane surplus breeding, and are used to promote dangerous interactions with members of the public, such as feeding or touching a tiger cub.²⁷

An estimated 5,000 to 15,000 tigers (*Panthera tigris*) live in captivity in the U.S., with fewer than 4,000 remaining in the wild.²⁸

While the U.S. captive tiger estimation may give the impression that the species is thriving, globally, tigers are listed as endangered on the International Union for Conservation of Nature's ("IUCN") Red List of Threatened Species.²⁹ Owners of roadside facilities, like Joe Exotic's G.W. Zoo, often claim their profitable cub petting programs support the global efforts of wildlife conservation by funding projects abroad and by aiming to educate the public on species endangerment.³⁰ Also, roadside zoos frequently claim their captive breeding practices will aid in the ultimate goal of delisting an endangered or threatened species from the ESA.³¹ However, for

25. *See id.*

26. *See* Martha Drouet & Asia Siev, MICH. STATE UNIV. COLL. OF L.: ANIMAL LEGAL & HIST. CTR., *Detailed Discussion of Exotic Pet Laws Update*, *Exotic Pet Laws* (2022), <https://www.animallaw.info/article/detailed-discussion-exotic-pet-laws-update>; Tala DiBenedetto, *Detailed Discussion of Welfare Standards for Animals Used in Zoos and Exhibition*, MICH. STATE UNIV. COLL. OF L.: ANIMAL LEGAL & HIST. CTR. (2020), <https://www.animallaw.info/article/detailed-discussion-welfare-standards-animals-used-zoos-and-exhibition#id-13>.

27. *See, e.g.*, Pacelle, *supra* note 11.

28. *Big News for Big Cats*, LEWIS & CLARK L. SCH.: CTR. FOR ANIMAL LEGAL STUD. (Feb. 21, 2023), <https://law.lclark.edu/live/news/50481-big-news-for-big-cats>.

29. Lynam Goodrich et al., *Panthera tigris, Tiger*, THE IUCN RED LIST OF THREATENED SPECIES (2022), <http://dx.doi.org/10.2305/IUCN.UK.2015-2.RLTS.T15955A50659951.en>.

30. *See* TIGER KING, *supra* note 1, (quoting Joe Exotic) ("So you get a baby tiger in a family's lap, and they fall in love with this baby tiger, and you have 15 minutes of their undivided attention to say 'Look, we gotta save the rainforest because you're killing this little baby tigers...you know where he came from.' They leave with a whole different attitude.").

31. *See* Cassady Cohick, Comment, *The Forgotten Cool Cats and Kittens: How a Lack of Federal Oversight in the USDA Led to Inhumane Loopholes in the Exploitation of Big Cats in America*, 6 ADMIN. L. REV. ACCORD 125, 132 (2021).

various reasons, very few (if any) captive-bred big cats in the U.S. will ever be released back into their native environments to replenish dwindling populations.³²

In reality, cub petting programs exploit the public's affection toward baby animals to generate profits under a "pay-to-play" business scheme.³³ Under such a scheme, a young animal is used as a prop for photos, selfies, and petting by paying customers.³⁴

While the customer is likely unaware of the animal neglect and cruelty implications involved, the profits gained perpetuate an inhumane breeding cycle, which relies on excessive and continuous breeding of big cats.³⁵ Offspring of captive surplus breeding practices often suffer severe congenital deformities when selectively bred and inbred for specific physical traits, especially for white tigers and hybrid big cats.³⁶ Congenital health problems include cleft palates, immune deficiencies, mental impairments, gigantism, spinal problems, lameness, issues with lung development, and others.³⁷

Essentially, the surplus breeding practices used to supply roadside cub petting programs are characterized by the following cycle: (1) a cub is forcibly taken from its mother and enters the cub petting program immediately after its birth.³⁸ Apart from the apparent animal cruelty concerns of repeatedly separating a mother and her cubs, immediately removing newborn cubs sends the mother into estrus more quickly, where a heat cycle occurs every twenty-five days on average, resulting in her producing litter after

32. *Tiger King: why can't we just release America's captive tigers into the wild?* UNIV. OF READING, <https://research.reading.ac.uk/research-blog/tiger-king-why-cant-we-just-release-americas-captive-tigers-into-the-wild/#:~:text=Captive%20tigers%20and%20survival&text=The%20problem%20is%20that%20captive,their%20fitness%20and%20hunting%20ability> (last visited Apr. 19, 2024) (long-term captive animals seldom learn crucial hunting skills, are habituated toward humans, and captive big cats are often inbred, which reduces genetic diversity and compromises overall health, leading to increased chronic illness and mortality).

33. See Saryn Chorney et al., *Poor Welfare Indicators and Husbandry Practices at Lion (Panthera Leo) "Cub-Petting" Facilities: Evidence from Public YouTube Videos*, 12 ANIMALS 20, 2 (2022); Tom Moorhouse et al., *Unethical Use of Wildlife in Tourism: What's the Problem, Who Is Responsible, and What Can Be Done?*, 25 J. SUSTAIN. TOUR. 4, 505-06 (2017).

34. Chorney et al., *supra* note 33, at 3.

35. *Id.* at 2.

36. See *Captive v. Wild: Why breeding tigers for entertainment is not conservation*, WORLD WILDLIFE FUND, https://tigers.panda.org/news_and_stories/stories/why_breeding_tigers_for_entertainment_is_not_conservation (last visited Nov. 8, 2023) [hereinafter WWF].

37. Chorney et al., *supra* note 33, at 10; see *PETA Decimates the Cruel Cub-Petting Industry*, PETA (Jul. 17, 2023), <https://prime.peta.org/news/peta-decimates-the-cruel-cub-petting-industry/>.

38. Steve Winter & Sharon Guynup, *Inside our two-year investigation of the captive tiger industry*, NAT'L GEOGRAPHIC (Nov. 2, 2023), <https://www.nationalgeographic.com/animals/article/captive-tigers-wildlife-crime-eliza-scidmore-award>.

litter.³⁹ In the wild, female tigers breed approximately every two and half years, allowing the cub six months to wean and the adult female time to teach the cub necessary hunting skills.⁴⁰ (2) To maximize profits, an individual cub is handled by customer after customer, day after day, until the cub is approximately twelve weeks old.⁴¹

A recent South African study examined the stress responses of lion cubs (*Panthera leo*) handled by tourists during cub photo-op programs and found that cub petting caused acute negative welfare impacts while normalizing cub petting and perpetuating inhumane and unsustainable captive breeding.⁴² (3) Once a cub is too big and dangerous to be handled, it is either used for breeding more cubs, sold at high profits on the illegal black market for parts (i.e., fur, bones, organs, blood, “canned” trophy hunts, etc.), sold via the exotic pet trade to other animal collectors, where the breeding cycle continues, or inhumanely killed to avoid feeding costs.⁴³ Methods used by roadside facilities to kill a cub that is no longer useful for photo-ops include beating the cub with a baseball bat or hammer.⁴⁴

2. Accredited Zoos Achieve & Maintain High Standards of Animal Welfare, Care, and Management

Unlike unaccredited roadside zoos, accredited facilities must achieve and maintain high animal welfare, care, and management standards set by private accreditation associations, such as the Association of Zoos and Aquariums (“AZA”).⁴⁵ AZA-accredited institutions seek to maximize animal healthcare, nutrition, habitat sanitation, husbandry, humane and sustainable breeding, and public education.⁴⁶ They also strategically evaluate the benefits and risks of direct human-animal contact.⁴⁷ Accredited facilities provide

39. Rachael Bale, *Key facts that ‘Tiger King’ missed about captive tigers*, NAT'L GEOGRAPHIC (Apr. 1, 2020), <https://www.nationalgeographic.com/animals/article/captive-tigers-joe-exotic-tiger-king>; *Tiger (Panthera tigris) Fact Sheet: Reproduction & Development*, SAN DIEGO ZOO WILDLIFE ALL., <https://ielc.libguides.com/sdzg/factsheets/tiger/reproduction> (last visited Nov. 19, 2023).

40. See WWF, *supra* note 36.

41. Kitty Block & Sara Amundson, *After the ‘Tiger King’ era, new ways to help other captive wild animals*, HUMANE SOC'Y OF THE U.S. (Apr. 6, 2023), <https://www.humanesociety.org/blog/after-tiger-king-era-new-ways-help-other-captive-wild-animals>.

42. Chorney et al., *supra* note 33, at 9-12; Winter & Guynup, *supra* note 38.

43. Chorney et al., *supra* note 33, at 11; Winter & Guynup, *supra* note 38.

44. Josh Wigler, *“Tiger King”: PETA Lawyer Reveals What “Viewers Didn’t Get to See” in Netflix Doc*, HOLLYWOOD REP. (Apr. 3, 2020) (Brittany Peet, a PETA Foundation lawyer, describing how many exhibitors will get rid of or kill tiger cubs once they age out of use for cub petting).

45. See DiBenedetto, *supra* note 26.

46. See THE ACCREDITATION STANDARDS & RELATED POLICIES, ASSOC. OF ZOOS & AQUARIUMS 13 (2023), <https://assets.speakcdn.com/assets/2332/aza-accreditation-standards.pdf>.

47. *Id.*

animals with daily mental stimulation through physical, social, and environmental enrichment.⁴⁸ Highly educated and professionally trained staff form strong human-animal relationships, keep detailed records, and implement complex management programs to optimize an animal's well-being and overall quality of life.⁴⁹

Thus, compared to unaccredited zoos, the high standards set by private accreditation associations and achieved by qualifying facilities ensure a high standard of animal welfare, care, and management beyond the minimum standards prescribed by federal and state animal welfare laws.⁵⁰ However, of the approximately 2,800 USDA-licensed exhibitors across the U.S., less than ten percent are accredited by the AZA.⁵¹ Thus, when seeking to address systemic animal welfare and public safety issues prevalent among unaccredited USDA-licensed facilities, reliance on achieving accreditation is not a viable alternative to strengthening uniform federal regulation of captive animals commercially bred and publicly exhibited.⁵²

C. Inadequate Regulation of Private Exotic Pet Ownership & Small-Scale Breeding

Thus far, this Note has discussed the AWA's regulation of commercially bred and exhibited exotic species. As discussed above, the AWA is limited in scope to regulating establishments where captive animals are, in some capacity, involved in a chain of commerce.⁵³ Thus, private possession and small-scale breeding of exotic pets is not regulated at the federal level under the AWA.⁵⁴ Accordingly, where private possession and small-scale breeding occurs intrastate, owners may fraudulently pose as a USDA licensee without having to conform to AWA standards or may exploit loopholes among a patchwork of lax, inconsistent, and infrequently prosecuted state and local animal welfare and cruelty laws.⁵⁵

48. *See id.* at 20.

49. *See id.*

50. *See* Riedman et al., *supra* note 22, at 1-7.

51. *See Accreditation FAQ: What Percentage of Zoos and Aquariums are Accredited by AZA?*, ASSOC. OF ZOOS & AQUARIUMS, <https://www.aza.org/accredfaq?locale=en#:~:text=Of%20the%20approximately%202%2C800%20animal,meet%20our%20rigorous%20accreditation%20standards> (last visited Nov. 8, 2023).

52. *See, e.g.*, Riedman et al., *supra* note 22, at 5-7.

53. *See* 7 U.S.C. § 2131 (The AWA as amended defines *commerce* as including “trade, traffic, transportation, or other commerce.” 7 U.S.C. § 2132(c)).

54. *See id.*

55. *See* Drouet & Siev, *supra* note 26; MICHELLE KIRBY, CONN. GEN. ASSEMB. OFFICE LEGIS. RSCH., 2018-R-0111, ANIMAL CRUELTY CASES IN CONNECTICUT (2007-2017) (2018) (A summary of Connecticut's primary animal cruelty statute shows that between 2007 to 2017 of the 3,480 animal cruelty cases initiated, 45% were never prosecuted; and 35% were dismissed).

For instance, before the enactment of the BCPSA, the USDA left to the states the regulation of intrastate private ownership of big cats as pets (versus big cats kept for commercial activities).⁵⁶

As such, private owners of pet big cats were under no obligation to federally register the animals under their possession.⁵⁷

Without a federal registration requirement, the number of pet big cats among America's backyards resulted in speculative population estimates.⁵⁸ Thus, the welfare of pet big cats hinged on inconsistent state and local laws, creating a substantial risk to public safety, especially for first responders or during instances of an animal's escape or intentional release.⁵⁹

For example, in 2011, Terry Thompson, owner of a hobbyist exotic animal farm in Zanesville, Ohio, committed suicide after intentionally releasing fifty of his fifty-six exotic animals from his property.⁶⁰ As a small-scale hobby breeder who did not commercially deal or publicly exhibit animals, Thompson was not subject to AWA licensing and care requirements.⁶¹ Thus, Thompson fell through the cracks of regulatory oversight because, at the time, Ohio did not restrict or regulate private ownership of exotic animals within the state.⁶² Once the animals were intentionally released, animal control and law enforcement officers were not equipped to recapture eighteen tigers, seventeen lions, eight bears, three cougars, two wolves, one baboon, and one macaque.⁶³ Thus, officers resorted to using lethal force to gain control of the dangerous situation, resulting in forty-nine animal deaths.⁶⁴

**III. TO CONSERVE & PROTECT:
THE BCPSA'S STRATEGIC AMENDMENT TO
THE LACEY ACT (VERSUS THE AWA) STRENGTHENS THE
HUMANE MANAGEMENT OF CAPTIVE BIG CATS**

During the Rules Committee July 26, 2022, BCPSA cosponsor, U.S. Representative Ed Case (HI-01), called on Congress to create a

56. Cohick, *supra* note 31, at 136.

57. *See id.* at 129, 133, 135.

58. Winter & Guynup, *supra* note 38.

59. *See, e.g.*, Chris Heath, *18 Tigers, 17 Lions, 8 Bears, 3 Cougars, 2 Wolves, 1 Baboon, 1 Macaque, and 1 Man Dead in Ohio*, GQ MAGAZINE (Feb. 6, 2012), <http://www.gq.com/news-politics/newsmakers/201203/terry-thompson-ohio-zoo-massacre-chris-heath-gq-february-2012>.

60. *Id.*

61. Drouet & Siev, *supra* note 26, at Section III, Part C.

62. *See* OHIO REV. CODE ANN. § 935.02 (West 2012) (in response to the Thompson incident, Ohio passed a new statutory scheme in 2012, effective January 1, 2014, which bars anyone from owning a "dangerous wild animal").

63. Heath, *supra* note 59.

64. *Id.*

more stringent federal standard for private ownership, breeding, and display of big cats in the U.S.⁶⁵ In response, opponents raised three primary challenges to the BCPSA's amending the Lacey Act.⁶⁶ First, opponents argued that the BCPSA blatantly superseded state law and the authority conferred by the AWA to APHIS to regulate captive big cats.⁶⁷

Second, opponents argued that the BCPSA created a duplicative regulatory authority, considering regulation already existed under the AWA to oversee the humane treatment and public display of big cats.⁶⁸

Third, opponents argued that the U.S. Fish & Wildlife Service (“FWS”) under the Lacey Act was ill-equipped and lacked agency expertise to administer appropriate intrastate law enforcement compared to the USDA and APHIS under the AWA.⁶⁹ Thus, opponents felt an amendment to the AWA, instead of the Lacey Act, would efficiently accomplish the objectives of the BCPSA without unnecessary federal overreach, regulatory duplication, or concerns of effective law enforcement.⁷⁰

Sponsors of the BCPSA countered that the AWA only sets basic animal welfare standards and, contrary to the opponent's duplicative argument, no federal law existed to regulate the private ownership and breeding of big cats.⁷¹ As a result, enactment of the BCPSA would effectively strengthen, support, and expand protections already in place under the Lacey Act.⁷² More specifically, the BCPSA's amending the Lacey Act would support state, federal, and international wildlife conservation objectives by expanding the jurisdiction of the FWS—an agency with regulatory authority and expertise in combating illegal wildlife trafficking under the Lacey Act and conservation of endangered terrestrial species under the ESA.⁷³

65. See *Hearing on H.R. 4040 and H.R. 263 Before the H. Comm. on Rules*, *supra* note 65 (statement of Rep. Ed Case).

66. *Id.* (statement of Rep. Brue Westerman).

67. *Id.*

68. *Id.*

69. *Id.*

70. *Id.*

71. See *Hearing on H.R. 4040 and H.R. 263 Before the H. Comm. on Rules*, *supra* note 65 (statement of Rep. Ed Case); see also *Map of Private Exotic Pet Ownership Laws*, MICH. STATE UNIV.: COLL. OF L., ANIMAL LEGAL & HIST. CTR., <https://www.animallaw.info/content/map-private-exotic-pet-ownership-laws> (last visited Feb. 11, 2024) (map details an inconsistent patchwork of state statutory and regulatory schemes that ban, partially ban, require licensure, or provide miscellaneous regulations on private ownership of wild or exotic animals).

72. *Hearing on H.R. 4040 and H.R. 263 Before the H. Comm. on Rules*, *supra* 65.

73. *Id.*; see 18 U.S.C. § 42; 16 U.S.C. § 1531 *et seq.*

A. The Lacey Act: The Nation’s Most Powerful Weapon in the Fight Against Illegal Wildlife Trafficking

Illegal wildlife trafficking is a multibillion-dollar global industry, where high demand for exotic pets and exotic animal parts (furs, skins, feathers, fins, trophies, skulls, bones, tusks, ingredients in traditional Eastern medicines, etc.) generates an estimated \$7.8 billion to \$10 billion per year.⁷⁴ Like many markets, the ease with which exotic animals are advertised or auctioned online contributes to their trade.⁷⁵ Social media has significantly impacted the rise of the exotic pet trade by creating a “viral” appeal among social media users who seek to purchase an exotic animal to personally share in its popularity and post pictures and videos online.⁷⁶

For example, Slow Lorises (genus *Nycticebus*) are protected by Southeast Asian law and the Convention on International Trade in Endangered Species of Fauna and Flora (“CITES”).⁷⁷ However, a viral YouTube video of the teddy-bear-like primate—a species unfamiliar to the general public before the video went viral—resulted in its near extinction when poachers and traffickers sought to profit from the acute demand generated by social media audiences.⁷⁸

The Lacey Act, enacted in 1900, is the nation’s oldest national wildlife protection statute and chief among the federal provisions protecting against the illegal trade of wild or exotic animals.⁷⁹

Under the Lacey Act, as amended, “it is unlawful for any person . . . to import, export, transport, sell . . . any fish or wildlife . . . taken, possessed, transported, or sold in violation of any law, treaty, or regulation”,⁸⁰ including an “attempt to commit any such act.”⁸¹

74. *End Wildlife Trafficking*, U.S. IMMIGR. & CUSTOMS ENF’T, <https://www.ice.gov/features/wildlife#:~:text=Illicit%20wildlife%20trafficking%20is%20estimated,as%20%247%20billion%20per%20year> (last visited Nov. 9, 2023).

75. See U.N. OFF. ON DRUGS & CRIME, WORLD WILDLIFE CRIME REPORT: TRAFFICKING IN PROTECTED SPECIES 25 (2020), https://www.unodc.org/documents/data-and-analysis/wildlife/2020/World_Wildlife_Report_2020_9July.pdf.

76. See K.A.I. Nekaris & Carly Starr, *Conservation and Ecology of the Neglected Slow Loris: Priorities and Prospects*, 28 ENDANGERED SPECIES RSCH. 87, 88 (2015), <https://www.int-res.com/articles/esr2015/28/n028p087.pdf>.

77. *Id.* at 88-90.

78. *Id.* at 88; see K. Anne-Isola Nekaris et al., *Tickled to Death: Analyzing Public Perceptions of ‘Cute’ Videos of Threatened Species (Slow Lorises—*Nycticebus* spp.) on Web 2.0 Sites*, 8 PLOS ONE 1, 2-3, 9 (2013), <https://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0069215&type=printable>.

79. See 16 U.S.C. §§ 3371-3378; Robert Anderson, *The Lacey Act: America’s Premier Weapon in the Fight Against Unlawful Wildlife Trafficking*, 16 PUB. LAND L. REV 27, 29-30 (1995).

80. 16 U.S.C. § 3372(a)(1).

81. *Id.* § 3372(a)(4).

Thus, the backbone of the Lacey Act's fight for species conservation is its reinforcement of state, tribal, and foreign conservation laws.⁸² Notably, the Act applies to a broader array of wild or exotic animals than does the AWA, by defining the term "fish or wildlife" as "any wild animal, whether alive or dead, including . . . any wild mammal, bird, reptile, amphibian, fish, mollusk, crustacean, arthropod, coelenterate, or other invertebrate, *whether or not bred, hatched, or born in captivity*, and includes any part, product, egg, or offspring thereof."⁸³

However, despite the Lacey Act's strengths, in 2003, a U.S. Senate report found that the Act failed to explicitly address public safety issues arising from an increasing U.S. captive big cat trade.⁸⁴

Consequently, the Captive Wildlife Safety Act of 2003 ("CWSA"), amended the Lacey Act Amendment of 1981, making it illegal for "any person to import, export, transport, sell, receive, acquire, or purchase [big cats], in interstate or foreign commerce."⁸⁵

Nevertheless, the CWSA did not expressly prohibit private ownership and breeding of big cats.⁸⁶ Also, the Act exempted USDA-licensed, registered, and inspected persons and only prohibited accredited wildlife sanctuaries from allowing the public to make direct contact with a big cat.⁸⁷ Thus, USDA-licensed roadside zoos continued exploiting animals via their cub petting programs, allowing the industry to profit from inhumane surplus breeding and illicit interstate movement of big cats and their parts.⁸⁸

Accordingly, as discussed in more detail below, the BCPSA builds on the CWSA by providing a uniform federal policy for the issues arising from big cat ownership, breeding, trade, and exhibition.⁸⁹

82. See Anderson, *supra* note 79, at 30.

83. 16 U.S.C. § 3371(a) (emphasis added).

84. S. REP. NO. 108-172, at 1 (2003), <https://www.govinfo.gov/content/pkg/CRPT-108srpt172/html/CRPT-108srpt172.htm>.

85. Captive Wildlife Safety Act, Pub. L. No. 108-191, § 3(a)(1), 117 Stat. 2871 (2003) (codified as 16 U.S.C. §§ 3371-72) (The CWSA defines "prohibited wildlife species" as "any live species of lion, tiger, leopard, cheetah, jaguar, or cougar, or any hybrid of such species" (i.e., "big cats")).

86. See *id.* at §§ 2-3.

87. *Id.* at § 3(a)(2).

88. See, e.g., Pacelle, *supra* note 11; see also BIG CAT INCIDENTS IN THE U.S., PETA, <https://www.peta.org/wp-content/uploads/2021/06/BigCatIncidentList.pdf> (last visited Apr. 9, 2024).

89. Big Cat Public Safety Act, Pub. L. No. 117-243, 136 Stat. 2336 (2022); see also Hearing on H.R. 4040 and H.R. 263 Before the H. Comm. on Rules, *supra* note 65 (statement by Rep. Ed Case); Map of Private Exotic Pet Ownership Laws, MICH. STATE UNIV. COLL. OF L.: ANIMAL LEGAL & HIST. CTR. (2022), www.animallaw.info/content/map-private-exotic-pet-ownership-laws.

B. The Role of the Endangered Species Act in Protecting Endangered Captive Exotic Animals

The U.S. Supreme Court describes the ESA as the nation's "most comprehensive legislation for the preservation of endangered species ever enacted by any nation."⁹⁰ Under the ESA, it is illegal to possess, buy, sell, import, export, transport, or "take" (i.e., "harm" or "harass") an endangered captive or wild animal unless a person obtains an appropriate permit.⁹¹

Critical to the discussion of captive big cats is the fact that most species are listed as endangered and, therefore, protected under the ESA.⁹²

How, then, can such a powerful federal law allow commercial exhibitors, such as the Tiger King, to possess and breed endangered species in clear violation of the conservation objectives of the Act? First, the primary purpose of the ESA focuses on habitat and species conservation, not on animal welfare *per se*.⁹³ Also, commercial dealers and exhibitors of endangered species may exploit potential loopholes provided by the ESA's exceptions (i.e., its permitting scheme).⁹⁴ For instance, while the ESA's captive-bred wildlife permit places restrictions on commercial breeding and trade, historically, the Act imposes less stringent and inconsistently enforced regulations for captive populations compared to free-roaming members of the same protected species.⁹⁵

IV. LEGAL PROTECTIONS REQUIRE A STRONG FOUNDATION: THE BCPSA'S THREE-PILLAR FRAMEWORK

Generally, the BCPSA amends "the Lacey Amendments of 1981 to clarify provisions enacted by the [CWSA], to further the

90. *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 180 (1978).

91. 16 U.S.C. §§ 1532(19), 1538(a); 50 C.F.R. § 17.3 (FWS issues permits allowing for activities otherwise in violation of the ESA's general "take" prohibition, including permits for scientific research, enhancement of propagation or survival, or where a taking is incidental to an otherwise lawful activity.).

92. *Listed Animals*, U.S. FISH & WILDLIFE SERV. ENV'T CONSERV. ONLINE (ECOS), <https://ecos.fws.gov/ecp0/reports/ad-hoc-species-report?kingdom=V&kingdom=I&status=E&status=T&status=EmE&status=EmT&status=EXPE&status=EXPN&status=SAE&status=SAT&mapstatus=3&fcrithab=on&fstatus=on&fspecrule=on&finvpop=on&fgroup=on&header=Listed+Animals> (last visited Nov. 15, 2023) (hereinafter *Listed Animals*).

93. See 16 U.S.C. § 1531(b) ("The purposes of [the ESA] are to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such endangered species . . .").

94. See *id.* § 1539.

95. *Id.*; 50 C.F.R. § 17.21(g); Kali Grech, MICH. STATE UNIV. COLL. OF L.: ANIMAL LEGAL & HIST. CTR., *Overview of the Laws Affecting Zoos* Part II A(ii) (2004), <https://www.animallaw.info/article/detailed-discussion-laws-affecting-zoos>.

conservation of certain wildlife species.”⁹⁶ The definition of “prohibited wildlife species” remains unchanged from the amendments created by the CWSA, and is defined as “any live species of lion, tiger, leopard, cheetah, jaguar, or cougar or any hybrid of such species” (i.e., big cats).⁹⁷ This list includes the following species: lion (*Panthera leo*), tiger (*Panthera tigris*), leopard (*Panthera pardus*), snow leopard (*Uncia uncia*), clouded leopard (*Neofelis nebulosa*), jaguar (*Panthera onca*), cheetah (*Acinonyx jubatus*), and cougar (*Puma concolor*).⁹⁸

Consistent with the Lacey Act, violators of the BCPSA are subject to civil and criminal penalties,⁹⁹ and big cats “bred, possessed, imported, exported, transported, sold, received, acquired, or purchased” contrary to the provisions of the Act are subject to forfeiture.¹⁰⁰ The BCPSA provides a three-pillar framework by (1) creating an absolute ban on direct physical contact between a member of the public and a big cat, (2) creating a ban on the breeding and possession of big cats by private owners, and (3) expanding federal regulatory oversight of intrastate trade of big cats where the “import, export, transport, [sale]” is conducted “in a manner substantially affecting interstate or foreign commerce.”¹⁰¹

A. Absolute Prohibition Against Direct Physical Contact

The BCPSA prohibits an exhibitor from allowing direct physical contact between a member of the public and a big cat, including cubs.¹⁰² However, USDA Class C exhibitors, state universities, and wildlife sanctuaries may allow certain qualified individuals (i.e., trained professional employees, employed trainees, contractors, licensed veterinarians, veterinarian students, and non-commercial conservation programs) to make direct contact with a big cat.¹⁰³ Furthermore, USDA-licensed exhibitors must ensure that during public exhibition, a big cat is at all times at least fifteen feet from members of the public unless there is a permanent barrier sufficient to prevent public contact.¹⁰⁴ Thus, while certain qualifying individuals may make direct contact with a big cat, the Act targets

96. Big Cat Public Safety Act, Pub. L. No. 117-243, Preamble, 136 Stat. 2336 (2022).

97. 16 U.S.C. § 3371(h); 50 C.F.R. § 14.252.

98. Sources cited *id.*; *Regulations to Implement the Big Cat Public Safety Act*, 88 Fed. Reg. 38358 (Jun. 12, 2023) (interim rule).

99. 16 U.S.C. § 3373.

100. *Id.* § 3374.

101. *See id.* § 3372(e).

102. *Id.* § 3372(e)(2).

103. *Id.* §§ 3372 (e)(2)(A)-(D) (stating that even where exempt, licensed persons and entities must not allow direct contact between the public and a big cat).

104. *Id.* § 3372(e)(2)(A)(ii).

the lifeblood of the unaccredited roadside zoo business model—its profitable tiger cub petting and photo-op programs.¹⁰⁵

Another significant change regarding prohibiting direct contact concerns a trainee.¹⁰⁶ Under the BCPSA, direct physical contact between a trainee and a big cat is contingent upon the individual's employment with the licensed facility.¹⁰⁷ Thus, volunteer trainees are not permitted to make direct contact with a big cat.¹⁰⁸

This change will likely create difficulties for volunteer trainees in jurisdictions where state licensure depends on demonstrating prerequisite professional training.¹⁰⁹ For instance, in Florida, those seeking Class I captive wildlife licensure, which includes species of big cats, must gain and demonstrate a requisite number of hands-on hours before the state will grant a permit to lawfully exhibit a Class I species.¹¹⁰

B. Prohibition Against Private Breeding & Possession

The BCPSA targets big cat private ownership by prohibiting “any person to breed or possess” a big cat.¹¹¹ However, under certain circumstances, commercial operations by USDA-licensed zoos, sanctuaries, and state universities are exempt from the Act’s general breeding and possession prohibition.¹¹² Such stringent restrictions on big cat breeding establishes a significant regulatory change considering, before the enactment of the BCPSA, the Lacey Act and CWSA did not expressly prohibit big cat breeding.¹¹³

Regarding lawful possession, following enactment on December 20, 2022, the Act provided 180 days for private owners to seek grandfathered-in status to lawfully possess their pet big cats.¹¹⁴

The grandfathered-in clause, which expired on June 18, 2023, required the pet owner to (a) federally register each animal with the FWS within 180 days of enactment; (b) not breed, acquire, or sell

105. *See* 16 U.S.C. § 3372(e).

106. *See id.* §§ 3372(e)(2)(A)-(D).

107. *Id.*

108. *Id.*

109. *See* FLA. ADMIN. CODE 68A-6.004(2)(c)(1) (requiring a Captive Wildlife Class I applicant, among other requirements, to “demonstrate no less than one year of substantial practical experience (to consist of no less than 1,000 hours) in the care, feeding, *handling* and husbandry of the species for which the permit is sought” (emphasis added)).

110. *Id.*

111. 16 U.S.C. § 3371(a) (“The term “breed” means to facilitate propagation or reproduction (whether intentionally or negligently), or to fail to prevent propagation or reproduction.”)

112. *Id.* § 3372(e)(2)(A)-(D).

113. *See* Big Cat Public Safety Act, Pub. L. No. 117-243, § 2, 136 Stat. 2336 (2022).

114. 16 U.S.C. § 3372(e)(2)(E).

any big cat; and (c) not allow direct contact between the public and a big cat.¹¹⁵

*C. Expansion of Federal Oversight:
Regulating Intrastate Trade*

Building upon the CWSA’s general prohibition against the interstate “import, export, transport” of big cats, the BCPSA expressly states that it is unlawful for any person, unless exempt, to “import, export, transport, sell, receive, acquire or purchase” a big cat in a “manner *substantially affecting* interstate or foreign commerce.”¹¹⁶ While congressional power to regulate interstate commerce itself is plenary under the Commerce Clause, Congress’s explicit use of the “substantially affecting” language in the BCPSA suggests its intent to regulate the big cat trade occurring wholly within state lines where such activities nevertheless have a substantial economic effect on commerce in other jurisdictions.¹¹⁷

**V. THE FUTURE OF PRIVATE PET OWNERSHIP &
COMMERCIAL EXHIBITION OF EXOTIC SPECIES**

The prohibitions and restrictions created by the BCPSA raise an intriguing question for animal welfare advocates—what other captive species might benefit from similar federal protections? Given the BCPSA’s limited definition of “prohibited wildlife species” (i.e., big cats), one can anticipate future legislative efforts to apply the Act’s three-pillar framework to similarly situated species common to private pet ownership and commercial roadside exhibition, such as the gray wolf and American alligator.¹¹⁸

*A. The BCPSA’s Framework Applied to
Similarly Endangered Species:
Roadside Wolf Puppy Petting Programs & Pet Wolfdogs*

On February 10, 2022, the U.S. District for the Northern District of California vacated and remanded a Trump-era FWS rule delisting the gray wolf (*Canis lupus*) from the ESA.¹¹⁹ Accordingly, except for the Northern Rocky Mountain population, all gray wolves in the

115. *Id.*; 50 C.F.R Part 14 (2023).

116. 16 U.S.C. § 3372(e)(1)(A) (emphasis added).

117. U.S. CONST. art. I, § 8, cl. 3 (The U.S. Constitution grants Congress broad power “to regulate commerce with foreign nations, and among the several states, and with the Indian tribes”).

118. *See* 16 U.S.C. § 3371(h).

119. *Defs. of Wildlife v. U.S. Fish & Wildlife Serv.*, 584 F. Supp. 3d 812 (N.D. Cal. 2021).

contiguous forty-eight U.S. states are federally protected under the ESA.¹²⁰ For populations of captive gray wolves, the animal welfare and public safety issues consequent of private pet ownership and roadside exhibition are synonymous with those of captive big cats.¹²¹

First, like big cats, given the physical and behavioral characteristics of gray wolves, their captive mismanagement may pose a substantial risk to human safety. Gray wolves are the largest wild members of the *Canidae*, or dog family, with an average weight of roughly 100 pounds.¹²² With predatory instincts similar to those of big cats, gray wolves have powerful jaws and are well-adapted for hunting and feeding on prey much larger than themselves.¹²³ Research by contemporary experts on gray wolf behavior and physiology finds that even where a wolf pup is reared under extensive human care, the animal nonetheless fails to demonstrate the enhanced cooperative-communication abilities displayed by domesticated dogs (*Canis familiaris*).¹²⁴

For example, in 2021, a study compared hand-reared domesticated dog and wolf pups, five to eighteen weeks old, on a battery of temperament and cognition tasks.¹²⁵ The researchers found domesticated dog puppies were more attracted to humans, more skilled at reading human gestures, and were prepared to communicate with humans, given that they made more eye contact than wolf pups.¹²⁶ These results demonstrate that domesticated dogs possess specialized social skills, allowing them to live cooperatively with humans.¹²⁷ Simultaneously, however, the results suggest wolves (of any age), whose temperament is inclined to avoid human interaction and novel stimuli, are a species not suited for private pet ownership or commercial activities allowing the public to make direct physical contact.¹²⁸

Second, like roadside exhibitors of captive big cats, roadside exhibitors of gray wolves often lack the requisite monetary

120. See 2023 USFWS GRAY WOLF STATEMENT, U.S. FISH & WILDLIFE SERV. (2023), <https://www.fws.gov/sites/default/files/documents/2023%20USFWS%20Gray%20Wolf%20Statement.pdf> (FWS intends to submit a proposed rule concerning the ESA listing status of gray wolves in the lower forty-eight states by February 2, 2024).

121. See, e.g., *Animal Legal Def. Fund v. Fur-Ever Wild*, No. 17-cv-4496, 2018 U.S. Dist. LEXIS 191348, at *2-3, *8 (D. Minn. Nov. 8, 2018).

122. *Gray Wolf: Overview*, U.S. FISH & WILDLIFE SERV., <https://www.fws.gov/species/gray-wolf-canis-lupus> (last visited Nov. 10, 2023).

123. See Daniel MacNulty, et al., *Ys 24-1 Understanding the Limits to Wolf Hunting Ability*, NAT'L PARK SERV., <https://www.nps.gov/yell/learn/ys-24-1-understanding-the-limits-to-wolf-hunting-ability.htm> (last visited Oct. 29, 2023).

124. Hannah Salomons et al., *Cooperative Communication with Humans Evolved to Emerge Early in Domestic Dogs*, 31 CURRENT BIOLOGY 3137, 3141-42 (2021).

125. *Id.* at 3137-38.

126. *Id.* at 3137-42.

127. *Id.* at 3141-42.

128. *See id.*

resources, behavioral knowledge, and access to veterinary care to optimize the animal's individualized and complex well-being.¹²⁹ For example, in 2018, Joe Exotic allegedly considered re-branding as the "Wolf King" by illegally transporting twenty-eight gray wolves from a Minnesota-based roadside zoo to his collection at the G.W. Zoo.¹³⁰

However, prior to his arrest that same year, the wolves proved too challenging for Exotic to handle and were rescued by Lockwood Animal Rescue Center ("Lockwood"), an accredited sanctuary in California.¹³¹

Third, like tiger cub petting programs, wolf pup petting programs incentivize inhumane surplus breeding practices and illicit interstate trade of an endangered species, which runs contrary to the objectives of the Lacey Act, AWA, ESA, and CITES.¹³² For example, in 2017, Lockwood and the Animal Legal Defense Fund ("ALDF") sought an injunction and order to surrender animals located at Fur-Ever Wild Wolves, Woods, & Wildlife, a Minnesota-based for-profit public exhibitor and fur-harvesting business.¹³³ According to the plaintiff's complaint:

The facility offers \$20 'pet-n-plays' with the wolf puppies while they are young."¹³⁴ Then, "[u]nbeknownst to most visitors, Fur-Ever Wild kills the gray wolves in the winter after the puppies grow too old for the pet-n-play visitor interactions. Fur-Ever Wild pelts the gray wolves and other animals to profit from their skin, skulls, teeth, bones, and other parts sold on-site at the facility's gift shop and off-site events. As [Defendant] admitted in a deposition related to another lawsuit: 'I pelted two wolves last night... And there is another two going tonight... There will be 25 within the next [two to] three weeks.'¹³⁵

Moreover, according to witness and USDA inspection reports, Fur-Ever Wild provided its gray wolves with inadequate veterinary

129. See, e.g., *Roadside Zoos: Small, unaccredited zoos where wild and exotic animals suffer in captivity*, ANIMAL LEGAL DEF. FUND, <https://aldf.org/issue/roadside-zoos/> (last visited Feb. 20, 2024).

130. *Joe Exotic Tried Hard to be 'Wolf King' in 2018 Before Getting Shut Down*, TMZ.COM (Apr. 19, 2020, 1:00 AM), <https://www.tmz.com/2020/04/19/joe-exotic-tiger-king-gray-wolves-animal-legal-defense-fund/>.

131. See *Meet Our Wolves and Wolfdogs*, LOCKWOOD ANIMAL RESCUE CTR., <https://lockwoodarc.org/larc-animals> (last visited Nov. 9, 2023) ("Big Boy" is one of the wolves rescued by Lockwood and originally acquired by Joe Exotic from Fur-Ever-Wild, a Minnesota wolf fur farm and wolf cub "pet-n-play" facility).

132. See, e.g., *Animal Legal Def. Fund v. Fur-Ever Wild*, No. 17-cv-4496, 2018 U.S. Dist. LEXIS 191348, at *1-2, *6 (D. Minn. Nov. 8, 2018).

133. *Id.* at *1-3.

134. Complaint at 3, *Animal Legal Def. Fund v. Fur-Ever Wild*, No. 17-CV-04496-JNE-HB, (D. Minn. 2019).

135. *Id.* at 4.

care, shelter, exercise, food, and water, and animals were observed with open, untreated wounds.¹³⁶ From the “period covering March 1, 2013, to February 28, 2014, the operation notes 19 wolves born and 19 deaths.”¹³⁷ Thus, according to the plaintiffs, Fur-Ever Wild violated the ESA by failing to provide gray wolves with adequate care, killing young wolves when no longer pups, and selling their pelts and other parts for profit.¹³⁸ Ultimately, in 2019, the court ruled against Fur-Ever Wild on a motion for summary judgment, finding that the gray wolves at issue, even those with a small amount of detectable dog genes, were generally protected by the ESA.¹³⁹

The court’s ruling in *Fur-Ever Wild* raises an important and complicated issue related to captive-bred gray wolves—the legal and regulatory challenges of overseeing ownership and management of wolfdog hybrids (i.e., a wolf bred with a domesticated dog). Due to the ease of internet sales and a viral phenomenon generated by social media, ownership of wolves and wolfdogs has dramatically increased in popularity.¹⁴⁰ In the U.S., it is estimated that 250,000 to 500,000 gray wolves and wolfdogs are owned as pets.¹⁴¹

However, like big cat pet ownership before the enactment of the BCPSA, there is currently no federal registration requirement or uniform law regulating the management of pet wolves or wolfdogs.¹⁴² Instead, regulation falls on state and local jurisdictions, which range from implementing a complete ban against owning pet wolves or wolf dogs, on the one hand, to limited or no regulatory restrictions, on the other.¹⁴³

For example, neighboring states Florida, Georgia, and Alabama significantly differ in their approach to regulating pet wolves and wolfdogs. In Florida, purebred wolves are classified as Class II

136. *Id.* at 5, 36-39.

137. *Id.* at 33.

138. *Id.* at 34-36, 49.

139. See *Animal Legal Def. Fund v. Fur-Ever Wild*, No. 17-CV-4496-JNE-HB, 2018 WL 2758580, *1-2 (D. Minn. Jan. 8, 2018); *Challenging Fur-Ever Wild’s Treatment of Wolves*, ANIMAL LEGAL DEF. FUND, <https://aldf.org/case/challenging-fur-ever-wilds-treatment-of-wolves/> (last visited Nov. 15, 2023) (the court found that Fur-Ever Wild’s wolves were predominately wolf with small amounts of detectable dog genes, and did not preclude the possibility that ESA protection could extend to wolves with more recent dog ancestors in other cases).

140. See Lisa Bloch, *Wolf-dog hybrids are becoming more popular—and that’s not a good thing*, THE MERCURY NEWS (Nov. 14, 2023), <https://www.mercurynews.com/2023/11/14/wolf-dog-hybrids-are-becoming-more-popular-and-thats-not-a-good-thing/>.

141. See *Wolf Dogs*, W.O.L.F. SANCTUARY, <https://wolfsanctuary.co/wolf-dogs/#:~:text=In%20the%20United%20States%20alone,wolf%20dogs%20owned%20as%20pets> (last visited Nov. 15, 2023).

142. See *Exotic Animal Laws by State*, FINDLAW, <https://www.findlaw.com/injury/torts-and-personal-injuries/exotic-animal-laws-by-state.html> (last visited Nov. 15, 2023).

143. See O.C.G.A. § 27-5-1 (2023); § 27-5-5; FLA. ADMIN. CODE § 68A-6.002(b); ALA. ADMIN. CODE r. 220-2-26 (2023).

wildlife because they are considered to present an actual or potential threat to human safety.¹⁴⁴ Thus, possession of Class II wildlife for personal or commercial purposes requires a permit from the Florida Fish & Wildlife Conservation Commission (“FWC”).¹⁴⁵

However, where a purebred wolf is bred with a domesticated dog to produce a wolfdog hybrid, the regulations become less clear as to what percentage of wolf genealogy is necessary to trigger the permit requirement.¹⁴⁶ Comparatively, Georgia completely bans ownership of pet wolves and wolfdog hybrids,¹⁴⁷ while Alabama has no state-level prohibition or permit requirement.¹⁴⁸

Resulting from inconsistent regulatory oversight, pet wolves and wolfdogs are often abandoned, neglected, and abused, leading to mistreatment, death, and, if forfeited, they are generally unadoptable by domestic animal services, leading to the animal’s euthanasia.¹⁴⁹ Given the dramatic increase in wolf and wolfdog popularity as pets, and that roadside exhibitors now lack the profit they once generated from tiger cub petting programs, one can reasonably anticipate that the prevalence of captive pet ownership and commercial reliance on wolf pup petting programs will continue to rise.¹⁵⁰ Thus, applying the BCPSA’s framework in future legislative efforts could provide captive endangered gray wolves and their hybrids with more robust federal protection.¹⁵¹

*B. The American Alligator:
Utilizing the BCPSA’s Public Safety Framework to
Protect Florida’s Official State Reptile*

Thus far, this Note has discussed applying the BCPSA framework to captive exotic species that, like big cats, are endangered and, therefore, protected under the ESA. However, consistent with its public safety element, might the framework provide for enhanced protection of species not listed under the ESA? Especially for abundant species, such as the American alligator (*Alligator mississippiensis*) that, unlike tiger cubs and wolf puppies,

144. FLA. ADMIN. CODE § 68A-6.002(b).

145. *Id.* at § 68A-6.003; 68A-6.010-011.

146. *Id.* at § 68A-6.002(d) (“Hybrids resulting from the cross between wildlife and domestic animal, which are substantially similar in size, characteristics and behavior so as to be indistinguishable from the wild animal shall be regulated as wildlife at the higher and more restricted class of the wild parent.”).

147. *See* OFF. CODE OF GA. ANN. § 27-5-1; § 27-5-5 (2023).

148. *See* ALA. ADMIN. CODE r. § 220-2-.26 (2023).

149. *See* Bloch, *supra* note 140.

150. *See, e.g., id.*; Animal Legal Def. Fund v. Fur-Ever Wild, No. 17-cv-4496, 2018 U.S. Dist. LEXIS 191348 (D. Minn. Nov. 8, 2018).

151. *See* 16 U.S.C. § 3372(e).

do not benefit from being characterized as charismatic megafauna (i.e., they are not generally considered “cute and cuddly”).

The American alligator (“alligator”) is a keystone carnivorous species found throughout Florida and various ecosystems of the Southeastern United States.¹⁵² While noticeable differences exist between big cats and alligators, the latter’s size, strength, and predatory instincts are analogous to the former’s, necessitating enhanced regulatory oversight.¹⁵³ For instance, mature alligators weigh up to a thousand pounds, range from six to fourteen feet in length, are fast over short distances, and have powerful jaws and tails.¹⁵⁴

As an abundant cold-blooded species, captive alligators are exempt from federal protections granted by the AWA and ESA.¹⁵⁵

Thus, regulation of alligator conservation, private pet ownership, and commercial exhibition varies by state and municipality.¹⁵⁶ Consistent with exotic species previously discussed, online sales, auctions, and popularity on social media contribute to a growing phenomenon of alligator pet ownership.¹⁵⁷ As a result, in recent years, wildlife officials across the nation have observed a rise in alligator abandonment in parks and public places.¹⁵⁸

In 1987, the Florida legislature designated the American alligator as the official state reptile.¹⁵⁹ FWC regulates live alligators as a Class II wildlife species and provides regulations governing personal possession and public exhibition.¹⁶⁰ Florida’s prevalent wildlife tourism attractions include “alligator wrestling” and baby alligator photo-ops.¹⁶¹ While the exact origins of alligator wrestling are widely debated, some argue the modern attraction extends from the capturing techniques used by southeastern Native Americans,

152. *American Alligator*, FLA. FISH & WILDLIFE COMM’N, <https://myfwc.com/wildlife/habitats/profiles/reptiles/alligator/> (last visited Nov. 13, 2023).

153. *See id.*

154. *Id.*

155. *See* 7 U.S.C. § 2132(g); *Listed Animals*, *supra* note 91; *Reclassification of American Alligator to Thr. Due to Similarity of Appearance Throughout Remainder of its Range*, 52 Fed. Reg. 21059-21064 (Jun. 4, 1987). While the conservation status of the American alligator is of least concern, it is technically listed as threatened under the ESA because of its similar appearance to the endangered American crocodile. *Id.* However, these protections are largely weak and unenforced in the context of an alligator bred or possessed in captivity.

156. *See* 7 U.S.C. § 2132(g); *Listed Animals*, *supra* note 91.

157. Tina Deines, *Alligators Make Terrible Pets*, NATL GEOGRAPHIC (Jul. 31, 2020), <https://www.nationalgeographic.com/animals/article/pet-alligators#:~:text=Official%20numbers%20on%20how%20many.city%20of%20Chicago%20each%20year>.

158. *Id.*

159. FLA. STAT. ANN. § 15.0385 (LexisNexis 2023).

160. *Id.* §§ 379.3761-379.3762; FLA. ADMIN. CODE ANN. 68A-6.002-6.003 (2024).

161. Casey Riordan et al., *Investigating the Welfare and Conservation Implications of Alligator Wrestling for American Alligators (Alligator mississippiensis)*, 15 PLOS ONE 11, 3 (2020).

such as the Seminole tribe.¹⁶² Today, alligator wrestling is performed by non-native wrestlers across the country and has received increased attention following the Animal Planet series “Gator Boys,” which documented a team of non-native alligator trappers and wrestlers.¹⁶³ Wrestlers often claim that alligator wrestling promotes environmental and species conservation, as the Tiger King claimed with respect to his tigers.¹⁶⁴

Contrary to popular belief, reptiles are capable of experiencing a range of emotions, such as anxiety, fear, distress, frustration, and suffering.¹⁶⁵ Research suggests that alligator wrestling causes them substantial and routine stress, provides little to no environmental conservation benefits, and creates an extreme risk to the health and safety of the viewing public.¹⁶⁶ Alligator wrestling involves physically restraining an alligator’s legs and torso, poking or slapping the animal’s jaws, dragging the animal by the mouth, tail, and limbs, flipping the alligator onto its back, and poking the eyes to elicit a reaction.¹⁶⁷ Wrestling shows often conclude with profitable photo opportunities, whereby a young alligator’s jaws are taped closed before excessive forced handling by members of the public, many of which are children.¹⁶⁸ Thus, like the animal welfare and public safety concerns giving rise to enhanced captive big cat regulation, privately owned and commercially exhibited alligators could benefit from comparable uniform federal protection.¹⁶⁹

VI. CONCLUSION

The passing of the BCPSA is an incredible accomplishment for those animal advocates striving to strengthen the U.S.’s relatively weak animal welfare laws. Moving forward, the BCPSA’s three-pillar framework should be applied to similarly situated animals, such as the gray wolf and American alligator. Policymakers, lawmakers, regulators, and other stakeholders such as accredited zoological professionals, licensed veterinarians, filmmakers, and members of the voting public should continue to support the

162. *Id.* at 5-6.

163. *Id.* at 3; *Gator Boys*, ANIMAL PLANET, <https://www.animalplanet.com/show/gator-boys-animal-planet> (last visited Feb. 9, 2024); *see also SCALES TAILS AND TEETH TRAVELING ROADSHOWS*, <https://scalestailsandteeth.com/roadshow/> (last visited Apr. 9, 2024).

164. *See* Riordan, *supra* note 161, at 3 (Florida’s AZA-accredited St. Augustine Alligator Farm also claims to support environmental conservation without offering alligator wrestling, putting into question whether wrestling is necessary to achieve conservation).

165. *Id.*; Helen Lambert et al., *Given the Cold Shoulder: A Review of the Scientific Literature for Evidence of Reptile Sentience*, 9 ANIMALS 821, at *2-*4.

166. *See* Riordan, *supra* note 161, at 14-15.

167. *Id.* at 6.

168. *See id.* at 15.

169. *See* 16 U.S.C. § 3372(e).

promulgation of uniform federal laws seeking to restrict inhumane private pet ownership and exploitative commercial exhibition of exotic animals.

