

University of Denver

Digital Commons @ DU

Sturm College of Law: Faculty Scholarship

University of Denver Sturm College of Law

1-1-2019

Fracking the Public Trust

Kevin J. Lynch

University of Denver, klynch@law.du.edu

Follow this and additional works at: https://digitalcommons.du.edu/law_facpub



Part of the [Environmental Law Commons](#), and the [Oil, Gas, and Mineral Law Commons](#)

Recommended Citation

Kevin J. Lynch, Fracking the Public Trust, 10 San Diego J. Climate & Energy L. 69 (2019).

This Article is brought to you for free and open access by the University of Denver Sturm College of Law at Digital Commons @ DU. It has been accepted for inclusion in Sturm College of Law: Faculty Scholarship by an authorized administrator of Digital Commons @ DU. For more information, please contact jennifer.cox@du.edu, digitalcommons@du.edu.

Fracking the Public Trust

Publication Statement

Copyright held by the author. User is responsible for all copyright compliance.

Originally published as Kevin J. Lynch, Fracking the Public Trust, 10 San Diego J. Climate & Energy L. 69 (2019).

Publication Statement

Copyright held by the author. User is responsible for all copyright compliance.

Originally published as Kevin J. Lynch, Fracking the Public Trust, 10 San Diego J. Climate & Energy L. 69 (2019).

Fracking the Public Trust

KEVIN J. LYNCH*

TABLE OF CONTENTS

I.	INTRODUCTION	69
II.	FRACKING AND ITS IMPACTS	71
III.	THE PUBLIC TRUST DOCTRINE	76
IV.	TAKINGS LAW AND BACKGROUND PRINCIPLES.....	81
V.	FRACKING THE PUBLIC TRUST.....	84
VI.	CONCLUSION	89

I. INTRODUCTION

Climate change presents an ever more urgent threat, and in 2019, atmospheric carbon dioxide levels reached an all-time high.¹ Current federal policies promoting fossil fuel extraction² implicate how future governments

* © 2019 Kevin J. Lynch. Associate Professor of Law, Sturm College of Law, University of Denver. J.D. 2007, New York University School of Law; B.A., 2001, Rice University.

1. Recent measurements of carbon dioxide in the atmosphere reached 415 parts per million, a level not seen in approximately three million years. *E.g.*, Denise Chow, *Carbon Dioxide Hits a Level Not Seen for 3 Million Years. Here's What That Means for Climate Change—and Humanity*, NBC NEWS: ENV'T (May 14, 2019), <https://www.nbcnews.com/mach/science/carbon-dioxide-hits-level-not-seen-3-million-years-here-ncna1005231> [<https://perma.cc/WC2P-ZP39>]; *Global Carbon Dioxide Levels Measured Atop Mauna Loa Set a New Monthly Record*, HAWAII NEWS NOW (Mar. 7, 2019), <http://www.hawaiinewsnow.com/2019/03/07/global-carbon-dioxide-levels-measured-atop-mauna-loa-set-new-record/> [<https://perma.cc/8AH4-NCR8>].

2. The goal of “energy dominance” pushed by the current Administration includes numerous activities to encourage or subsidize fossil fuels, such as drilling for oil and gas on public lands. Cooper McKim, *Trump Push for ‘Energy Dominance’ Boosts Drilling on Public Land*, NAT’L PUB. RADIO (Nov. 25, 2018), <https://www.npr.org/2018/11/25/666373189/>

will need to deal with fossil fuels—specifically how such future governments must leave fossil fuels in the ground if our society hopes to avoid catastrophic climate change.³

One of the largest obstacles governments face when deciding whether to leave fossil fuels in the ground is the threat of massive takings liability, as takings claims will likely be used to challenge any government attempts to slow or prevent the extraction of fossil fuels. This has been particularly relevant in the ongoing debates over fracking, which has enabled a boom in oil and gas production in the United States.⁴ Takings liability is the boogeyman that state and local regulators see around every corner.⁵ Moreover, lobbyists for the oil and gas industry raise the specter of takings liability to oppose even the most modest regulatory proposals which in any way appear to affect their bottom line.⁶ However, the fear of takings liability is misplaced.⁷

The current and future threats society faces by unchecked fossil fuel development create ample room for governments to regulate or even ban

trump-push-for-energy-dominance-boosts-drilling-on-public-land [https://perma.cc/4PG9-CT2Q].

3. The latest scientific goal is to limit greenhouse gas emissions in order to keep the global temperature increase to 1.5 degrees Celsius or less. INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, GLOBAL WARMING OF 1.5°C (2018), <https://www.ipcc.ch/sr15/> [https://perma.cc/F3E4-TUR4] (last visited Apr. 30, 2019) [hereinafter IPCC, GLOBAL WARMING OF 1.5°C].

4. The fracking boom has increased production of oil and gas in the U.S. so much that it has regained the status of the top producer in the world. *See, e.g.*, U.S. ENERGY INFO. ADMIN., *The United States Is Now the Largest Global Crude Oil Producer* (Sept. 12, 2018), <https://www.eia.gov/todayinenergy/detail.php?id=37053> [https://perma.cc/3T2R-DS7G].

5. *See* John D. Echeverria & Thekla Hansen-Young, *The Track Record on Takings Legislation: Lessons from Democracy's Laboratories*, 28 STAN. ENVTL. L.J. 439, 500 (2009) (noting the phenomenon of “regulatory retreat” that occurred after Florida and Oregon expanded takings liability in their states).

6. For example, Colorado voters considered a ballot measure in 2018 that would have modestly increased setbacks for oil and gas development from homes, schools, and other important areas to 2500 feet. Industry claimed that enormous takings liability would follow if this law passed. Luane Kadlub, *Colorado Alliance of Mineral and Royalty Owners Says State Could Be on the Hook for \$26 Billion if Oil and Gas Setbacks Increase*, GREELEY TRIBUNE (June 12, 2018), <https://www.greeleytribune.com/news/business/colorado-alliance-of-mineral-and-royalty-owners-says-state-could-be-on-hook-for-26-billion-if-oil-and-gas-setbacks-increase/> [https://perma.cc/A9P9-M8QN]. The ballot measure failed, likely due at least in part to these threats and the enormous amount of money spent by the industry on attack ads. *See* Jacy Marmaduke, *Proposition 112 Failed. What's Next for Oil and Gas Setbacks?*, FORT COLLINS COLORADOAN (Nov. 6, 2018), <https://www.coloradoan.com/story/news/politics/elections/2018/11/06/colorado-election-proposition-112-fails-oil-gas-setbacks/1893643002/> [https://perma.cc/YT68-DBGN] (noting industry-backed groups spent \$36 million opposing the measure).

7. *See* Kevin J. Lynch, *Regulation of Fracking Is Not a Taking of Private Property*, 84 U. CIN. L. REV. 38, 42–46 (2016).

the extraction of fossil fuels as part of their obligations under the public trust doctrine. Traditionally, the public trust doctrine developed to protect common resources such as navigable rivers.⁸ In modern times, however, the doctrine has expanded to other trust resources, such as the atmosphere.⁹ Thus, the public trust doctrine acts as a background principle of law that insulates regulation of fracking from takings liability—even for total takings under *Lucas v. S.C. Coastal Council*.¹⁰ This Article explores the application of the public trust doctrine to fracking, specifically as it relates to regulations designed to prevent harms of continued greenhouse gas (GHG) emissions as a result of the extraction and burning of fossil fuels.

II. FRACKING AND ITS IMPACTS

Fracking is the current shorthand for the oil and gas industry,¹¹ but it specifically refers to the process known as high volume hydraulic fracturing. Although hydraulic fracturing has been used for many years,¹² technological breakthroughs in the past ten to twenty years have enabled extraction of oil and gas from rock formations that were previously inaccessible.¹³ Current

8. See *Ill. Cent. R.R. Co. v. Illinois*, 146 U.S. 387, 455–56 (1892) (“[P]roperty is held by the State, by virtue of its sovereignty, in trust for the public. The ownership of the navigable waters of the harbor and of the lands under them is a subject of public concern to the whole people of the State. The trust with which they are held, therefore, is governmental and cannot be alienated, except in those instances mentioned of parcels used in the improvement of the interest thus held, or when parcels can be disposed of without detriment to the public interest in the lands and waters remaining”).

9. Mary C. Wood, *Atmospheric Trust Litigation Across the World*, FIDUCIARY DUTY AND THE ATMOSPHERIC TRUST 7 (Ken Cogill et al. eds., 2012), available at SSRN: <https://ssrn.com/abstract=1945562> [<https://perma.cc/4PYD-KKVL>].

10. 505 U.S. 1003 (1992).

11. Although fracking and oil and gas development are not formally synonymous, in common practice they are often used interchangeably. This article intentionally uses “fracking” in its broader sense, both for readability purposes and because the term helps convey crude thoughts using acceptable language in a formal publication. Thus, the phrase “fracking the public trust” is intended to convey frustration and some unpleasant connotations, just as the *Battlestar Galactica* franchise used “frak” as a stand-in for another four-letter word. See Chris Talbott, *What the ‘Frak’? Faux Curse Seeping Into Language*, ASSOCIATED PRESS (Sept. 2, 2008), https://tucson.com/news/what-the-frak-faux-curse-seeping-into-language/article_b5eeb180-8124-5516-8851-79eef2b5aca1.html [<https://perma.cc/SLX2-D9FJ>].

12. Fracking can be traced back at least to the 1940s. E.g., Hannah Wiseman, *Untested Waters: The Rise of Hydraulic Fracturing in Oil and Gas Production and the Need to Revisit Regulation*, 20 FORDHAM L. REV. 115 (2009).

13. For a more detailed discussion of the development of fracking, see Lynch, *Regulation of Fracking*, *supra* note 7; Kevin J. Lynch, *A Fracking Mess: Just Compensation*

fracking practices rely on the ability to drill directionally and horizontally so that a well may pass for many miles through a narrow band of rock that has relatively low porosity.¹⁴ Fracking involves the underground injection of water, sand, and chemicals which are then used to break apart the rock formation so that oil and gas can flow into the well along the horizontal length.¹⁵ This action dramatically increases the amount of oil and gas that can be recovered, which is necessary to offset the tremendous cost of drilling horizontally and the fracking process itself.¹⁶

These modernized developments in technology and application have greatly changed and intensified the impacts of fracking on the surrounding community, and this is of particular concern when it occurs near populated areas. Our understanding of the public health impacts of such pollution and industrial disturbance has also grown.¹⁷ However, researchers and policymakers have struggled to keep up with the rapid developments and a constantly evolving industry. Additionally, as the understanding of the climate change impacts has increased, it is clear that the burning of fossil fuels, such as oil and natural gas, has become more concerning.¹⁸

Considering local impacts, it is important to note that fracking is an industrial activity that would otherwise be considered out of place in residential and commercial areas. However, in many states, oil and gas development is allowed even in these areas in spite of any local zoning laws that would otherwise prohibit industrial activity near homes, schools, parks, shopping centers, and other places where people spend much of their time. Yet fracking operations pose serious risks to safety and health due to the inherent risk of explosions and spills. Aside from accidents, fracking

for Regulatory Takings of Oil and Gas Property Rights, 43 COLUM. J. OF ENVTL. L. 335, 344–48 (2018).

14. David Blackmon, *Horizontal Drilling: A Technological Marvel Ignored*, FORBES (Jan. 28, 2013), <https://www.forbes.com/sites/davidblackmon/2013/01/28/horizontal-drilling-a-technological-marvel-ignored/#1c3b99926f11> [<https://perma.cc/7N8M-DTPA>] (discussing the interplay between horizontal drilling and fracking which opened up oil and gas reserves previously inaccessible).

15. Wiseman, *Untested Waters*, *supra* note 12.

16. See U.S. ENERGY INFO. ADMIN., TRENDS IN U.S. OIL AND NATURAL GAS UPSTREAM COSTS 2 (Mar. 2016), <https://www.eia.gov/analysis/studies/drilling/pdf/upstream.pdf> [<https://perma.cc/VK2P-XZMC>] (finding costs of wells ranging from \$4.9 million to \$8.3 million, most of which is due to completion or fracking).

17. See FOOD AND WATER WATCH, THE SOCIAL COSTS OF FRACKING: A PENNSYLVANIA Case Study (Sept. 2013), https://www.foodandwaterwatch.org/sites/default/files/Social%20Costs%20Fracking%20Report%20Sept%202013_0.pdf [<https://perma.cc/9Q33-SX3K>] (providing an early look at the social impacts of fracking).

18. See INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, FIFTH ASSESSMENT REPORT, CLIMATE CHANGE 2013: THE PHYSICAL SCIENCE BASIS, SUMMARY FOR POLICYMAKERS 11 (2013) (noting fossil fuels as the primary source of climate change emissions) [hereinafter IPCC, FIFTH ASSESSMENT REPORT].

operations impose many externalities on their neighbors in the form of noise,¹⁹ light pollution, heavy truck traffic, and air pollution.²⁰ These demonstrated harms and other risks and uncertainties have led some jurisdictions to ban fracking outright.²¹ However, other jurisdictions struggle to respond to public concerns while simultaneously enabling oil and gas development in urbanized areas.²²

Fracking also has concerning regional impacts, primarily those related to air pollution and the use and contamination of water supplies. Fracking emits many ozone precursors, particularly volatile organic compounds, which are significant contributors to smog problems in some urban areas.²³

19. See, e.g., Cynthia M. Richburg & Jeremy Slagley, *Noise Concerns of Residents Living in Close Proximity to Hydraulic Fracturing Sites in Southwest Pennsylvania*, 36 PUB. HEALTH NURSING 3 (2019).

20. See, e.g., Lisa M. McKenzie et al., *Relationships Between Indicators of Cardiovascular Disease and Intensity of Oil and Natural Gas Activity in Northeastern Colorado*, 170 ENVTL. RES. 56 (2019) (noting the relationship between individuals with heart disease and their proximity to oil and gas development, due to environmental stressors such as air pollution or noise).

21. N.Y. STATE DEP'T OF ENVTL. CONSERV., FINAL SUPPLEMENTAL GENERIC ENVIRONMENTAL IMPACT STATEMENT ON THE OIL, GAS, AND SOLUTION MINING REGULATORY PROGRAM: FINDINGS STATEMENT 34–41 (2015).

22. This tension is apparent in the ongoing conflict between industry and the public in Colorado. As the oil and gas industry began encroaching on densely populated areas of the Northern Front Range, several local governments responded with attempts to ban or regulate oil and gas, most notably the cities of Longmont and Fort Collins. These attempts were met with resistance from the state and oil and gas industries, all of whom convinced the state supreme court to declare that Colorado had an interest in fracking sufficient to preempt local bans or moratoria. See *Longmont v. Colo. Oil & Gas Ass'n*, 369 P.3d 573, 580 (2016). The fight over fracking then shifted to the state's agency and legislature. For example, following public outcry over the approval of many oil and gas wells in close proximity to schools, the Colorado Oil and Gas Conservation Commission updated its rules to revise setbacks required between the wells and school properties—the revised rules now require the distances be measured from the school's property line rather than the school building. See COLO. OIL & GAS CONSERVATION COMM'N, SCHOOL SETBACK RULEMAKING, <https://cogcc.state.co.us/reg.html#/rules/schoolsetbackrulemaking> [<https://perma.cc/W665-Z6VY>] (last visited Apr. 30, 2019). Colorado's Governor recently signed legislation that will place greater emphasis on protection of public health and safety while explicitly allowing more local regulation of oil and gas. See S.B. 19-181 Reg. Sess. (Co. 2019). Still, Colorado's legislature has refused to go so far as to ban fracking out of concern over local, regional, or global climate impacts.

23. Oil and gas are big contributors to violations of the National Ambient Air Quality Standard for ozone in the Denver region. Jason M. Evans & Detlev Helmig, *Investigation of the Influence of Transport from Oil and Natural Gas Regions on Elevated Ozone Levels in the Northern Colorado Front Range*, 67:2 J. OF AIR & WASTE MGMT. ASS'N 196–211 (2017). See also Erin E. McDuffie, et al., *Influence of Oil and Gas Emissions on*

Thus, even if oil and gas operations are located far enough away from people to avoid acute local impacts, pollution from the industry nevertheless contributes significantly to unhealthy air in some regions. Fracking also involves significant use of water, which is of short supply in many places in the Western United States.²⁴ Furthermore, unlike other uses such as agriculture,²⁵ water that is used in fracking is often contaminated either with chemicals from the fracking process itself or from other chemicals released from the ground, making it unsuitable for returning to water sources and put to other uses.²⁶ Thus, particularly in the arid West, fracking is a threat to fresh water supplies found in rivers, lakes, and reservoirs.

Finally, fracking has allowed access to oil and gas resources that were uneconomical to extract until recently, resulting in production of oil and gas that were previously kept safely in the ground. This means fossil fuels are more plentiful and therefore inexpensive, which further promotes their continued use so long as regulators continue not to price or tax carbon emissions.²⁷ As a result, the oil and gas industry continues to receive massive publicly-funded subsidies while regulatory authorities permit waste from oil and gas to be dumped into the atmosphere at no cost to the industry.²⁸ Such actions—or rather, inactions—necessarily increase the levels of carbon dioxide and other GHGs in our atmosphere.²⁹ This not only causes but

Summertime Ozone in the Colorado Northern Front Range, 121:14 J. OF GEOPHYSICAL RES.: ATMOSPHERES 8712–29 (July 2016).

24. Andrew J. Kondash et al., *The Intensification of the Water Footprint of Hydraulic Fracturing*, 4 SCI. ADV. 1, 4 (Aug. 15, 2018) (noting that concern over water use “is especially high in semiarid regions”).

25. Agricultural uses of water have significant return flows and thereby potential for reuse of water supplies. *E.g.*, U.S. DEP’T OF AG., AGRICULTURAL RESOURCES AND ENVIRONMENTAL INDICATORS, ch. 2.2 at 1, https://www.ers.usda.gov/webdocs/publications/41964/30287_irrigationwater.pdf?v=0 [<https://perma.cc/BG7K-MU5H>].

26. Kondash, *supra* note 24, at 1 (“The wastewater generated from hydraulic fracturing is composed of a blend of returned injected hydraulic fracturing water and typically high saline formation water that flows back out of the well . . .”).

27. The idea that fossil fuel extraction and use thereof should account for the economic costs it imposes on society is known as the “social cost of carbon”. *See* ENVTL. DEF. FUND, *The True Cost of Carbon Pollution* (2017), <https://www.edf.org/true-cost-carbon-pollution> [<https://perma.cc/VP7D-FSLM>].

28. Other than the limited number of jurisdictions that implemented a carbon tax or a cap-and-trade program, most fossil fuels do not pay for the costs, i.e., externalities, that they impose on society. *See, e.g.*, B.C. GOV’T, BRITISH COLUMBIA’S CARBON TAX, <https://www2.gov.bc.ca/gov/content/environment/climate-change/planning-and-action/carbon-tax> [<https://perma.cc/4L8E-MQPW>].

29. E. G. Nisbet et al., *Very Strong Atmospheric Methane Growth in the 4 Years 2014-2017: Implications for the Paris Agreement*, 33 GLOB. BIOGEOCHEMICAL CYCLES 1 (2019) (noting a recent spike in methane levels in the atmosphere).

accelerates climate change, which impacts public health,³⁰ wildlife,³¹ rivers,³² and oceans.³³ Although natural gas in particular is sometimes seen as a bridge fuel to wean the world off of coal usage, its benefits as a potential bridge fuel are contingent upon little to no leakage of natural gas,³⁴ which is principally composed of methane, a potent GHG. Unfortunately, studies of natural gas leakage rates demonstrate that leakage is higher than industry and government estimates and may negatively offset much, if not all, of the benefits of switching from coal to natural gas.³⁵

Methane leakage aside, fracking provides access to ever more reserves of both oil and natural gas. Consequently, it has accelerated the rate at which humanity burns through its “carbon budget”—the amount of fossil fuels that can be burned without causing unacceptable levels of climate change.³⁶ The “carbon budget” concept means that some oil and gas (as well as coal and other fossil fuels) must inevitably be left in the ground if we are to have any hope of retaining a global climate that is not radically different from the one of recent centuries. Thus, more states and national governments should follow the lead of New York and other jurisdictions

30. IPCC, GLOBAL WARMING OF 1.5°C, *supra* note 3, at 11, B.5.1-5.2 (2018) (noting health impacts especially in vulnerable populations).

31. *See id.* at 10, B.3.1 (discussing impacts on species loss and extinction).

32. Among the impacts on land use, increased droughts and floods are predicted even at the most ambitious targets for mitigating climate change. IPCC, GLOBAL WARMING OF 1.5°C, *supra* note 3, at 9, B.1.3 (2018). These increasing droughts and floods will have dramatic impacts on rivers and other navigable bodies of freshwater.

33. *See id.* at 9, B.2; 10, B.4 (2018).

34. Unfortunately, the oil and gas industry and its allies in the current federal administration have been weakening federal rules designed to reduce methane leakage from oil and gas, at precisely the time when stronger rules and enforcement are needed. *See* Marianne Lavelle, *Trump Targets Obama’s Methane Rules in Latest Climate Policy Rollbacks*, INSIDECLIMATENEWS (Sept. 18, 2018), <https://insideclimatenews.org/news/11092018/methane-flaring-rules-oil-gas-industry-climate-change-obama-trump-epa-rollback> [<https://perma.cc/2S2Y-A47U>] (discussing how proposed changes to Obama-era climate policies will save the oil and gas industry money but with costs to public health resulting from increased emissions).

35. *See, e.g.*, Ramon A. Alvarez et al., *Assessment of Methane Emissions from the U.S. Oil and Gas Supply Chain*, 361 SCI. 186 (2018) (indicating that actual emission are 60 percent higher than federal government estimates).

36. Kelly Levin, *According to New IPCC Report, the World is on Track to Exceed Its “Carbon Budget” in 12 Years*, WORLD RES. INST. (Oct. 7, 2018), <https://www.wri.org/blog/2018/10/according-new-ipcc-report-world-track-exceed-its-carbon-budget-12-years> [<https://perma.cc/E7U5-HVE2>].

that ban fracking outright.³⁷ Alternatively, states and national governments should impose a price on carbon emissions through either market-based systems like cap-and-trade or a carbon tax, or they may find another way to wean society off its addiction to fossil fuels and hasten the deployment of renewable energy sources. With these concerns in mind, this Article explores the public trust doctrine for use as both a sword and a shield to compel government to act when political dynamics are resistant or otherwise not up to the challenge. This Article further discusses how the public trust doctrine may be utilized to defend against the inevitable backlash from entrenched fossil fuel interests, with emphasis on takings claims when government regulations cause oil and gas to be left in the ground.

III. THE PUBLIC TRUST DOCTRINE

The public trust doctrine broadly reflects the principle that the government acts as a trustee over certain key resources, with the public and future generations as the beneficiaries of the trust.³⁸ The doctrine includes both a negative component—restricting the government from harming or alienating public resources in a way that is detrimental to impacts on the public—and a positive component—creating duties and obligations in the government to affirmatively manage and protect trust resources for the public. This section briefly covers the historical development of the public trust doctrine, from its ancient roots through its introduction and development in American law. This section also explores the key question regarding which resources are included in the public trust, and, finally, it notes some recent developments that have the potential to strengthen the role of the public trust doctrine with respect to fracking.

The public trust doctrine traces its origins to ancient Roman times and was codified in the Justinian code as, “[t]hus, the following things are by natural law common to all—the air, running water, the sea, and consequently the sea-shore.”³⁹ The idea that government had trust obligations over important common natural resources continued through English law and was then adopted by various American jurisdictions as well. Thus, New Jersey courts recognized the state could not divest the public of its right to access public resources.⁴⁰ The public trust doctrine was also recognized by the United

37. E.g., Thomas Kaplan, *Citing Health Risks, Cuomo Bans Fracking in New York State*, N.Y. TIMES (Dec. 17, 2014), <https://www.nytimes.com/2014/12/18/nyregion/cuomo-to-ban-fracking-in-new-york-state-citing-health-risks.html> [<https://perma.cc/59DV-F4XP>].

38. E.g., Richard M. Frank, *The Public Trust Doctrine: Assessing Its Recent Past & Charting Its Future*, 45 U.C. DAVIS L. REV. 665 (2012).

39. EMPEROR CAESAR FLAVIUS JUSTINIAN, *THE INSTITUTES OF JUSTINIAN* (J.B. Moyle trans. Oxford 1911).

40. *Arnold v. Mundy*, 6 N.J. L. 1, 78 (1821).

States Supreme Court when it held, “the shores, the rivers, and bays, and arms of the sea, and the land under them . . . [are] held as a public trust for the benefit of the whole community, to be freely used by all for navigation and fishery.”⁴¹ The public trust in *Martin* was recognized as an important aspect of the sovereignty.⁴² These same principles apply to the other states according to the equal-footing doctrine.⁴³

The most important early statement from the Supreme Court regarding the public trust doctrine is found in the Court’s decision in *Illinois Central*.⁴⁴ The case involved a claim of title by a private railroad company to lands that the state claimed ownership in as a public trust resource.⁴⁵ This Court’s opinion explained the limitations on government’s ability to alienate public trust resources, which was permitted only if the alienation would promote public interests in the transferred land or if it would not substantially impair the public’s interest in the remaining public trust resources.⁴⁶ The *Illinois Central* decision also noted some ways the American public trust doctrine diverged from the laws in England, specifically because the United States contains many navigable waterways that are not subject to the tides, including not only rivers but also the Great Lakes.⁴⁷ Thus, the Supreme Court has recognized the adaptability and flexibility of the doctrine in that it evolves when applied in new contexts.⁴⁸

Several state courts have developed the public trust doctrine even further than their federal counterparts. For example, Pennsylvania includes the public trust doctrine in its state constitution and has held that it applies, “not only to state owned lands, waterways, and mineral reserves, but also resources

41. *Martin v. Waddell’s Lessee*, 41 U.S. 367, 411–16 (1842).

42. *Id.* at 409–10.

43. *See, e.g.*, *PPL Montana, LLC v. Montana*, 565 U.S. 576, 590–91 (2012) (discussing the equal-footing doctrine under which “the people of each State, based on principles of sovereignty, ‘hold the absolute right to all their navigable waters and the soils under them,’ subject only to rights surrendered and powers granted by the Constitution to the Federal Government . . . under which a State’s title to these lands was ‘conferred not by Congress but by the Constitution itself.’”).

44. *Ill. Cent. R.R. Co. v. Illinois*, 146 U.S. 387 (1892).

45. *Id.* at 433–34.

46. *Id.* at 453.

47. *Id.* at 435–36.

48. This notion applies to both federal and state courts, as both have recognized the flexibility of the public trust doctrine. *See, e.g.*, *Marks v. Whitney*, 491 P.2d 374, 380 (Cal. 1971). *See also* *Robinson Twp. v. Commonwealth*, 83 A.3d 901, 955 (Pa. 2013) (noting the unqualified term “public natural resources” applies broadly and “is amenable to change over time to conform, for example, with the development of related legal and societal concerns.”).

that implicate the public interest, such as ambient air, surface and groundwater, wild flora, and fauna (including fish) that are outside the scope of purely private property.”⁴⁹ California also took an expansive view of the rights protected by the public trust doctrine in the famous Mono Lake case wherein the California Supreme Court held the doctrine protected areas for not only traditional navigation, commerce, and fisheries, but also other important public uses such as preservation of lands in their natural state for scientific study, open space, scenery, climate purposes, and as habitat for wildlife.⁵⁰ And, of course, the aforementioned oldest codification of the public trust doctrine was not limited to navigable waters and tidelands; it also included the air as an important component of the public trust.⁵¹ Thus, although some argue for less reliance on an expansive public trust doctrine, there is ample support from both caselaw and scholars that the public trust doctrine should have a broad and flexible application to protect the public interest in key common resources such as water, public lands, and the air we all breathe.⁵²

Finally, state and federal courts also commonly recognize a public trust in wildlife.⁵³ The United States Supreme Court recently recognized state authority over wildlife in a takings case, in which it distinguished a case where a taking was found to occur when oysters were harvested from beds of a state waterway from a case involving raisins, which are “the fruit of the growers’ labor”—the latter were not *ferae naturae* over which the state had sovereign authority.⁵⁴ State courts have similarly recognized state ownership

49. Robinson Twp., 83 A.3d at 955.

50. Marks v. Whitney, 491 P.2d at 380.

51. See *supra* note 39 and accompanying text.

52. See, e.g., Mary C. Wood & Charles W. Woodward, *Atmospheric Trust Litigation Across the World*, 6 WASH. J. ENVTL. L. & POL’Y 633, 654 (2012); Michael C. Blumm & Mary Christina Wood, “No Ordinary Lawsuit”: *Climate Change, Due Process, and the Public Trust Doctrine*, 67 AM. U. L. REV. 1, 42–54 (2017); Charles F. Wilkinson, *The Headwaters of the Public Trust: Some of the Traditional Doctrine*, 19 ENVTL. L. 425, 465–70 (1989); Kevin J. Lynch, *Application of the Public Trust Doctrine to Modern Fisheries Management Regimes*, 15 N.Y.U. ENVTL. L.J. 285, 291–304 (2007).

53. Michael C. Blumm & Lucas Ritchie, *Lucas’s Unlikely Legacy: The Rise of Background Principles as Categorical Takings Defenses*, 29 HARV. ENVTL. L. REV. 321, 352–54 (2005) (collecting cases dealing with the wildlife trust); Mary Christina Wood, *Protecting the Wildlife Trust: A Reinterpretation of Section 7 of the Endangered Species Act*, 34 ENVTL. L. 605, 609 n.18 (2004) (collecting other cases dealing with the wildlife trust).

54. See *Horne v. Dep’t of Agric.*, 135 S. Ct. 2419, 2431 (2015) (citing *Leonard & Leonard v. Earle*, 279 U.S. 392 (1929)). See also John D. Echeverria & Michael C. Blumm, *Horne v. Department of Agriculture: Expanding Per Se Takings While Endorsing State Sovereign Ownership of Wildlife*, 75 MD. L. REV. 657 (2016).

of wildlife resources.⁵⁵ State ownership of wildlife has also been recognized in state court as a defense to takings claims related to regulations to protect wildlife and endangered species.⁵⁶

Thus, the core of the public trust doctrine has been recognized repeatedly by United States courts and applies, at minimum, to navigable and tidal waters and the submerged lands beneath them. The trust serves to protect public interests in navigation, fishing, and commerce. A more expansive view of the public trust doctrine includes protection of other resources like air and wildlife, as well as additional uses like recreation and environmental protection.⁵⁷ Sovereigns—state and/or federal governments—are thus prohibited from using or disposing of public trust resources in a way that harms public interests. Further, such sovereigns also have an affirmative duty to protect public trust resources for the benefit of the public, the beneficiaries of the public trust.

Recent developments have the potential to advance public trust obligations in the climate change arena. Most prominent among these developments concerns pending litigation in federal district court in Oregon: the *Juliana* case.⁵⁸ Plaintiffs in *Juliana* include numerous youths who seek to compel the government to develop a comprehensive response to the climate change crisis, including a plan to reduce GHG emissions. The case is part of a growing movement of atmospheric trust litigation,⁵⁹ and it is being litigated by a non-profit organization called Our Children’s Trust.⁶⁰

The *Juliana* plaintiffs received a remarkable victory in 2016 when Judge Aiken of Oregon District Court denied motions to dismiss filed by the government and industry intervenors, effectively setting the stage for discovery

55. *Fields v. Wilson*, 207 P.2d 153, 156 (Or. 1949); DALE GOBLE AND ERIC T. FREYFOGLE, *WILDLIFE LAW: CASES AND MATERIALS* 381 (2002) (discussing state ownership of wildlife in all states).

56. Michael C. Blumm & Lucus Ritchie, *Lucas’s Unlikely Legacy: The Rise of Background Principles as Categorical Takings Defenses*, 29 HARV. ENVTL. L. REV. 321, 353 (2005) (discussing cases in New York and California); for further discussion of the public trust as a defense against takings claims, see *supra* Section III.

57. See *supra* notes 49–56 and accompanying text.

58. See Michael C. Blumm & Mary Christina Wood, “*No Ordinary Lawsuit*”: *Climate Change, Due Process, and the Public Trust Doctrine*, 67 AM. U. L. REV. 1 (2017) (Detailed background of the *Juliana* case).

59. *Id.* at 21.

60. *Id.* at 21. See also, *JULIANA v. UNITED STATES: YOUTH CLIMATE LAWSUIT*, OUR CHILD. TRUST, <https://www.ourchildrenstrust.org/juliana-v-us> [<https://perma.cc/SY44-MD75>]. Earth Guardians, a non-profit organization based in Boulder Colorado, is also an organization Plaintiff in the *Juliana* case. *Id.*

and trial proceedings to begin.⁶¹ Judge Aiken determined plaintiffs “adequately alleged infringement of a fundamental right” in their pleadings, such that the case should move forward to trial.⁶² The opinion specifically referenced plaintiffs’ fundamental right to a climate system capable of sustaining human life, recognition of which allows plaintiffs to proceed with their substantive due process claims against the government. Judge Aiken rejected claims by the government and industry intervenors that the plaintiffs suit rested on the notion that they have a right to be free from *any* pollution or climate change whatsoever, which they argued would open the floodgates to potential litigation against government action that in any way endangered the public.⁶³ Ultimately, Judge Aiken found that the lawsuit must proceed because, “[t]o hold otherwise would be to say that the Constitution affords no protection against a government’s knowing decision to poison the air its citizens breathe or the water its citizens drink.”⁶⁴ I could not agree more.

Although the case was set for trial commencing on October 29, 2018,⁶⁵ the case was stayed in December 2018 as the Ninth Circuit considers the federal government’s latest request to avoid trial.⁶⁶ The government’s attempts to avoid facing the youth in court lack sufficient merit, yet the Supreme Court has hinted that it might intervene to stop the trial, which would be

61. *Juliana v. United States*, 217 F. Supp. 3d 1224, 1252–53 (D. Or. 2016).

62. *Id.* at 1250.

63. *Id.* at 1250, 1252. This is not to minimize concerns over the expansive application of the public trust doctrine such that it would swallow all of the law. Even those who are very sympathetic to the urgency of addressing climate change may not agree that public trust litigation is the best means of meeting the challenge. *See, e.g.*, Richard J. Lazarus, *Judicial Missteps, Legislative Dysfunction, and the Public Trust Doctrine: Can Two Wrongs Make It Right?*, 45 ENVTL. L. 1139, 1152 (2015) (“... [I]t is a serious mistake to take the public trust doctrine far beyond its historic moorings.”). However, while I agree it would be best if political forces sufficiently motivated our elected officials to adequately respond to the threat of climate change, this simply has not occurred, and each day we grow closer to the necessary timescale. Thus, I strongly support any and all efforts to not only compel the needed action from our government(s), but also to overcome the entrenched and powerful interests of the fossil fuel industry and its government-associated enablers. The continued attempts by government and industry to avoid facing the youths in court is yet another instance of delay and avoidance leading us down a very dangerous path of climate disruption.

64. *Juliana*, 217 F. Supp. 3d at 1250.

65. *Press Release: Thousands Rally in Support of the Young Americans Behind Juliana v. United States on Monday*, OUR CHILD. TRUST (Oct. 25, 2018), <https://static1.squarespace.com/static/571d109b04426270152febe0/t/5bd286c44785d33e125cbdf/1540523717271/2018.10.25+Media+Advisory+for+Oct+29.pdf> [<https://perma.cc/J5RN-BSD3>].

66. *See Press Release: Youth Plaintiffs in Juliana v. United States Ask Ninth Circuit Court of Appeals to Lift Stay of Trial*, OUR CHILD’S TRUST (Dec. 20, 2018), <https://static1.squarespace.com/static/571d109b04426270152febe0/t/5c1c46608a922d0dbf1c8cf0/1545356897199/2018.12.13+Ninth+Circuit+Brief+to+Lift+the+Stay+PR.pdf> [<https://perma.cc/RHW9-3KPY>].

an unfortunate development.⁶⁷ The Court should resist the urge to halt this important case and stunt development of the public trust doctrine simply because a majority of the justices wish to avoid the current political dispute over whether our society should address the obvious hurdles posed by climate change and the continued reliance on fossil fuels.

IV. TAKINGS LAW AND BACKGROUND PRINCIPLES

Although takings law is notoriously complicated, this Article focuses on just one aspect of that law: the “background principles” defense to takings claims. The United States Supreme Court laid out the modern conception of this defense in *Lucas v. South Carolina Coastal Council*.⁶⁸ However, this doctrine is less of a defense of government action against takings claims and more of an elaboration on the idea that a vested property right is a precondition for a plaintiff’s successful takings claim.⁶⁹ The “background principles” defense previously received little attention because prior takings cases recognized that regulations designed to prevent harm, implemented under the authority of police powers, were generally immune to takings claims.⁷⁰ In the 1990s, however, the new conservative majority on the Supreme Court expanded takings liability by creating a per se takings rule for regulations that reduce the value of property to zero.⁷¹ In doing so, private property owners no longer had a vested right to use their property however they saw fit. Instead, where “background principles of the [s]tate’s law of property and nuisance” place restrictions on the use of private property,⁷² then a regulation which merely enforces that restriction is not

67. See Order Denying Gov’t Petition to Stay Proceedings Without Prejudice, 586 U.S. __ (2018), <https://www.scotusblog.com/wp-content/uploads/2018/11/18A410-In-Re-United-States-Order.pdf> [<https://perma.cc/Q4YA-NHKX>]. Although two Justices provided they would grant the requested Stay, the remaining Justices said they would not because the Ninth Circuit may still act on the case, so an extraordinary writ may not be appropriate as “adequate relief” may be obtained from another Court. See *id.* (citing S. Ct. Rule 20.1).

68. 505 U.S. 1003, 1029–30 (1992).

69. John D. Echeverria, *The Public Trust Doctrine as a Background Principles Defense in Takings Litigation*, 45 U.C. DAVIS L. REV. 931, 944 (2012).

70. *Id.*

71. *Lucas v. S.C. Coastal Council*, 505 U.S. 1003, 1029–30 (1992). Although this new per se rule was initially thought (and in some quarters, feared) to create a radical change in takings liability for government land use regulations, in practice, it has a very mild and limited effect.

72. *Lucas*, 505 U.S. 1003, 1029 (1992).

subject to liability or challenge as a taking.⁷³ The question then becomes: what counts as a background principle of law as part of the takings analysis?

Nuisances are the most obvious example of activities which private property owners may be prohibited from engaging in without the requirement of just compensation from the government.⁷⁴ And fracking operations can certainly rise to the level of a nuisance.⁷⁵ However, background principles go beyond merely nuisance and do not necessarily result in prohibition of the activity being regulated.⁷⁶ Thus, courts have applied the *Lucas* background principles defense in many different contexts including the natural use doctrine, the federal navigational servitude, customary rights like native gathering rights, water rights, the trust obligations with respect to wildlife, Indian treaty rights, and—most importantly for this Article—the public trust doctrine.⁷⁷ Though each of these legal doctrines are important, and many of them might apply in the context of fracking, this Article focuses solely on the public trust doctrine as a defense.

Scholars disagree somewhat about the precise scope of the public trust doctrine and when it should be used in litigation, but there appears to be a

73. See *id.* at 1027 (“Where the State seeks to sustain regulation that deprives land of all economically beneficial use, we think it may resist compensation only if the logically antecedent inquiry into the nature of the owner’s estate shows that the proscribed use interests were not part of his title to begin with.”).

74. *E.g., id.* at 1022 (citing Supreme Court case law, “sustaining against Due Process and Takings Clause challenges the State’s use of its “police powers” to enjoin a property owner from activities akin to public nuisances . . . [including] *Mugler v. Kansas*, 123 U.S. 623 (1887) (law prohibiting manufacture of alcoholic beverages); *Hadacheck v. Sebastian*, 239 U.S. 394 (1915) (law barring operation of brick mill in residential area); *Miller v. Schoene*, 276 U.S. 272 (1928) (order to destroy diseased cedar trees to prevent infection of nearby orchards); *Goldblatt v. Hempstead*, 369 U.S. 590 (1962) (law effectively preventing continued operation of quarry in residential area).”).

75. After a jury found that intense industrial fracking operations created a private nuisance, the Texas Court of Appeals overturned that verdict because the company did not intend to cause a nuisance. *Aruba Petrol. Inc. v. Parr*, No. 05-14-01285-CV, 2017 Tex. App. LEXIS 873 (2017). Some side effects of fracking that create nuisance effects for the surrounding area include noise and light pollution, air emissions, truck traffic, and the risk of spills and contamination of land and water. *Contra* Kevin J. Lynch, *Regulation of Fracking*, *supra* note 7, at 74 (discussing fracking as a nuisance). See also Hilary M. Goldberg et al., *It’s a Nuisance: The Future of Fracking Litigation in the Wake of Parr v. Aruba Petroleum, Inc.*, 33 VA. ENVTL. L.J. 1 (2015).

76. See John D. Echeverria, *The Public Trust Doctrine as a Background Principles Defense in Takings Litigation*, 45 U.C. DAVIS L. REV. 931, 949 (2012) (discussing *American Pelagic Fishing Co. v. United States*, 379 F.3d 1363, 1366–69 (Fed. Cir. 2004), wherein the court rejected claimants challenge to Congressional legislation that revoked a previously-acquired fishing permit as an unconstitutional taking, because, among other reasons, the background principle of sovereign control over the coastal Exclusive Economic Zone precluded claimant’s entitlement claim without making the conduct unlawful).

77. Michael C. Blumm & Lucas Ritchie, *Lucas’s Unlikely Legacy: The Rise of Background Principles as Categorical Takings Defenses*, 29 HARV. ENVTL. L. REV. 321, 341–54 (2005).

baseline consensus that the doctrine is an available and appropriate defense under the background principles doctrine in takings litigation. For example, Professor Richard Lazarus has some continuing concerns about broad usage of the public trust to address urgent environmental issues such as climate change. Nevertheless, he agrees the public trust doctrine is an appropriate response to the Supreme Court's expansion of takings jurisprudence in recent years.⁷⁸ Although Professor Lazarus would likely object to broad readings or expansions of the public trust doctrine in the takings context, he nonetheless thinks it as a useful defense to regulatory takings claims where "the doctrine can fairly be said to apply."⁷⁹ Thus, even though Professor Lazarus has been vocal about his concerns regarding the public trust doctrine, the background principles defense to takings is the one change in position he has made over the years regarding his views on the doctrine.

Other leading scholars similarly recognize the importance of the public trust doctrine in takings law. Professor John Echeverria, a leading expert on takings law, has advocated forcefully for use of the doctrine in defense to takings claims related to water use restrictions designed to protect fish and other public trust resources.⁸⁰ Although federal cases that prompted Echeverria's attention did not recognize the public trust doctrine as a defense, and ultimately were decided on other grounds, namely ripeness,⁸¹ there remain good reasons for recognizing the public trust doctrine as a takings defense. In fact, other cases have done just that—affirmatively recognizing the public trust as a defense against government liability.⁸²

Finally, some scholars and courts took a more expansive view of the public trust doctrine. Such views applied the doctrine beyond the core of

78. Richard J. Lazarus, *Judicial Missteps, Legislative Dysfunction, and the Public Trust Doctrine: Can Two Wrongs Make It Right?*, 45 ENVTL. L. 1139, 1149 (2015). However, Professor Lazarus has some concerns about broad usage of the public trust doctrine to address urgent environmental issues such as climate change. *See id.*

79. *Id.* This narrow view towards the appropriate utility of the public trust doctrine has been critiqued by others. *See, e.g.,* Michael C. Blumm, *Two Wrongs? Correcting Professor Lazarus's Misunderstanding of the Public Trust Doctrine*, 46 ENVTL. L. 481 (2016).

80. John D. Echeverria, *The Public Trust Doctrine as a Background Principles Defense in Takings Litigation*, 45 U.C. DAVIS L. REV. 931, 955 (2012) ("... courts should readily acknowledge that the public trust doctrine provides a background principles defense to a takings claim based on regulatory restrictions on the use of water designed to protect fish or other trust resources from harm.").

81. *E.g.,* *Casitas Mun. Water Dist. v. U.S.*, 708 F.3d 1340, 1359–60 (Fed. Cir. 2013) (providing that issues of ripeness ultimately decided the case).

82. *See, e.g.,* *Esplanade Props., LLC v. City of Seattle*, 307 F.3d 978, 985–87 (9th Cir. 2002); *R.W. Docks & Slips v. State*, 628 N.W.2d 781, 788 (Wis. 2001).

navigable waterways and the submerged lands beneath them or subject to the tide. Professor Michael Blumm, for example, developed the preeminent theory wherein a broader view of the doctrine related to the background principles defenses.⁸³ Professor Blumm collected numerous cases supporting expansive use of the public trust doctrine in this context.⁸⁴ Accordingly, states retain authority to extend the reach of their respective public trusts, just as California, New Jersey, and other states already have.⁸⁵ Although some commentators objected to such broad applications of the public trust doctrine as background principles defenses,⁸⁶ nothing in *Lucas* required reliance on static background principles of law that would not evolve over time.⁸⁷ Legal systems of property rights must constantly change to adapt to ongoing developments in both the world and human understanding.⁸⁸ It follows that abrupt and continuing changes induced by fracking and our growing understanding of its impact on public health, safety, and the environment (particularly the atmosphere and general climate) have thus led to changes in property rights and regulations of private property. Such changes are likely to increase going forward. I generally share the view that an expansive public trust doctrine is both a necessary and appropriate legal tool to address the impacts of fracking, particularly its contribution to climate change. Thus, the following section analyzes how the public trust doctrine can and should operate as a defense to takings claims.

V. FRACKING THE PUBLIC TRUST

The key question remains: What are the implications of applying the public trust doctrine to fracking? This section compares impacts of fracking

83. Blumm is not alone in this view, as other leading scholars have recognized the potential for the public trust doctrine to defend against takings claims in a broader context. See, e.g., Hope M. Babcock, *Has the Supreme Court Finally Drained the Swamp of Takings Jurisprudence: The Impact of Lucas v. South Carolina Coastal Council on Wetlands and Coastal Barrier Breaches*, 19 HARV. ENVTL. L. REV. 1, 3 (1995).

84. See Michael C. Blumm & Lucas Ritchie, *Lucas's Unlikely Legacy: The Rise of Background Principles as Categorical Takings Defenses*, 29 HARV. ENVTL. L. REV. 321, 341–54 (2005) (citing numerous cases supporting application of the public trust doctrine in the realm of background principles like the natural use doctrine, navigational servitudes, customary rights (e.g., indigenous gathering rights), water rights, Indian treaty rights, and the wildlife trust context).

85. *Id.* at 343.

86. *Id.* at 343 n.138 (collecting articles critical of broad public trust defenses to takings).

87. Michael C. Blumm, *Two Wrongs? Correcting Professor Lazarus's Misunderstanding of the Public Trust Doctrine*, 46 ENVTL. L. 481, 485–86 (2016) (discussing the “nonstatic nature” of the background principles defense).

88. Holly Doremus, *Takings and Transitions*, 19 J. LAND USE & ENVTL. L. 1, 3–4 (2003) (explaining that regulatory takings claims are “fundamentally conflicts over legal transitions” but also that “change is inevitable and necessary.”).

to the resources and uses protected by the public trust doctrine, noting many areas of overlap in both the traditional and expansive views of the doctrine. This section also specifically focuses on use of the public trust doctrine as a defense to takings claims based on legal restrictions on fracking—both on existing law and potential future laws arguably necessary to adequately address climate change. Finally, this section examines the affirmative obligations on state and federal governments to protect public trust resources from unacceptable impacts due to fracking.

Fracking impacts many resources and uses thereof that are protected by as part of the public trust. As discussed previously,⁸⁹ fracking affects traditional public trust resources including rivers and other navigable waters, oceans, and shorelines. For example, draining dry western rivers to enable fracking has impacts on navigable waterways used for commerce and fishing.⁹⁰ Offshore oil and gas development impacts trust resources in the territorial sea controlled by states or in federal waters, going out as far as the Exclusive Economic Zone 200 miles offshore.⁹¹ Spills can also contaminate rivers, lakes, and other navigable waters. These are all direct impacts of fracking on public trust resources, even in the most narrow and constrained form of the public trust doctrine. However, these impacts occur only when fracking operations are located near or in these waterways, so not all fracking would be implicated in this context.

However, the analysis need not be expanded much to include other indirect impacts of fracking, especially those related to climate change. Even under the assumption that the air or atmosphere is not within the public trust, climate change caused by unchecked fossil fuel emissions have numerous impacts on other trust resources, including the ocean, rivers and lakes, or wildlife. Carbon dioxide pollution, in particular, is causing ocean acidification,⁹² which impacts corals, fish, and other marine species that are essential for healthy functioning ocean ecosystems. Warming ocean and fresh water also similarly impact aquatic wildlife that is traditionally managed by states in

89. See *supra* Section I.

90. See Matt Stensland, *Stretch of Yampa River Closed to Fishing Due to Water Flow*, ASPEN TIMES (June 12, 2018), <https://www.aspentimes.com/news/stretch-of-yampa-river-closed-to-fishing-due-to-low-water-flow/> [<https://perma.cc/R9V9-FJZ6>].

91. See *generally* ADAM VANN, CONG. RES. SERV., RL33404, OFFSHORE OIL AND GAS DEVELOPMENT: LEGAL FRAMEWORK (2018), <https://fas.org/sgp/crs/misc/RL33404.pdf> [<https://perma.cc/AAS5-5X6J>].

92. IPCC, FIFTH ASSESSMENT REPORT, *supra* note 18, at 15.

trust for the public.⁹³ Even terrestrial wildlife will be affected by changing precipitation patterns, drought, increased prevalence of extreme heat, and other impacts attributable to climate change.⁹⁴

Indirect effects on navigable waters and wildlife aside, the most analytically sound application of the public trust doctrine recognizes, as the Romans did, the air and atmosphere as critical public resources relied on by all and protected under the public trust doctrine. The government therefore plays an important role in regulating emissions. This is so even if government involvement makes continued use of fossil fuels less profitable through regulation, or perhaps even outright prohibits extraction of some fossil fuels.⁹⁵ For example, the continued leasing of minerals on federally-owned lands also raises serious concerns.⁹⁶ Courts should recognize application of the public trust doctrine to the atmosphere. In doing so, fracking operations (and the ultimate burning of those fossil fuels) may only be permitted if they preserve necessary rights of the public in the atmosphere and other public trust resources. This is the same core principle recognized in Judge Aiken's ruling in the *Juliana* case, even though she framed it in substantive due process terms.⁹⁷

Recognition of the impacts of fracking on public trust resources⁹⁸ would have several key benefits for courts, legislatures, and administrative agencies. Most importantly, acknowledgment of the threats fracking poses to the public trust would embolden government officials to both enforce existing laws and enact new laws to protect trust resources. Additional government enforcement and legislative action in the fracking arena should be free from fears of not only burdensome litigation, but also crushing liability under the Takings Clause.⁹⁹ Thus, assuming they can overcome the political influence

93. *How Climate Change Effects Fishing*, CLIMATE CENT. (Aug. 22, 2018), <https://www.climatecentral.org/gallery/graphics/how-climate-change-affects-fishing> [<https://perma.cc/FZ6Q-L8Z4>].

94. IPCC, FIFTH ASSESSMENT REPORT, *supra* note 18, at 4.

95. The latter may occur even when mineral interests in the desired-extraction zones are privately owned.

96. Still, issues of leasing minerals on federal lands poses an easier case than that of restrictions on privately-owned minerals.

97. See *supra* text accompanying notes 61–64.

98. This Article is not the first work to propose or recognize the impact of fracking on public trust resources. See e.g., Mary Christina Wood & Rance Shaw, *Enforcing Human Rights Against Fracking Through the Public Trust Principle, Response to Center for Human Rights and Nature Questions for a Resilient Future: Does Fracking Violate Human Rights?* (2017), https://law.uoregon.edu/images/uploads/entries/Enforcing_Human_Rights_Against_Fracking_Through_the_Public_Trust_Principle_.pdf [<https://perma.cc/NHK4-3EDK>].

99. Existing literature on the takings clause indicates the threat of takings liability causes government to lose the will to regulate to address societal harms. See John D. Echeverria & Thekla Hansen-Young, *The Track Record on Takings Legislation: Lessons from Democracy's Laboratories*, 28 STAN. ENVTL. L.J. 439, 444 (2009). This fear of takings

of the oil and gas industry,¹⁰⁰ governments would have latitude to fairly balance competing interests while fulfilling the duty to protect the public—including future generations—from the worst impacts of climate change. As a result, more jurisdictions would be emboldened to follow New York’s lead and ban fracking, or California’s in enacting and implementing aggressive climate change policy. Still, the public trust doctrine may be utilized to prod reluctant governments to take action on climate change when political dynamics would otherwise thwart any meaningful action. The public trust doctrine can thus be used in litigation and other contexts to force public debate and perhaps even development of plans to address the impacts of fracking on public trust resources.

For takings liability, it would be important for courts to continue recognizing it would be important for courts to continue recognizing the public trust doctrine as a background principle of law. In relation to fracking, a judicial decision that property interests in minerals like oil and gas do not create an absolute right to *extract* those minerals would be incredibly important. Novel as such a holding may seem, it would be within existing confines of takings law. *Lucas* created an absurd bright line rule requiring compensation if all value of property is reduced by regulation. In doing so, the Court clarified issues in takings law that previously went unaddressed. Because the Court opted not to overturn past precedents that immunized police power regulations from takings liability,¹⁰¹ it was forced to grapple with the implications of its *per se* rule.¹⁰² Accordingly, courts must now carefully delineate the property right allegedly restricted. In the fracking context, this means the property right at issue is not merely the right to *extract* oil and gas, but also the right to *use* the oil and gas in a way that harms the public by polluting the air and impacting land, water, and wildlife resources. When courts recognize that mineral interest owners may not take a stick held in their “bundle” of rights and effectively poke their neighbors in the eye (by contributing to climate change), the takings analysis provides a fair resolution for all. This is not to say, however, that government regulation of fracking cannot be

liability is also common in the context of regulation of fracking. See Kevin J. Lynch, *A Fracking Mess: Just Compensation for Regulatory Takings of Oil and Gas Property Rights*, 43 COLUM. J. OF ENVTL. L. 335, 403 (2018).

100. Of course, this is the huge problem that has long impeded progress of addressing climate change. It is currently a major impediment in many jurisdictions in the United States.

101. See *Lucas v. S.C. Coastal Council*, 505 U.S. 1003, 1022 (1992) (discussing *Mugler v. Kansas*, 123 U.S. 623 (1887); *Hadachek v. Sebastian*, 239 U.S. 394 (1915); and *Miller v. Schoene*, 276 U.S. 272 (1928)).

102. *Id.* at 1022.

so unfair that the public must compensate the private interests affected. But in general, reasonable restrictions on fracking would not require just compensation, and thus private interests should not be able to block necessary steps to protect public trust resources by threatening crushing takings liability.

There is one caveat to this expansive discussion of fracking based on current takings law. The Supreme Court should not expand takings liability any further. In fact, the Court should scale back regulatory takings jurisprudence from its flawed and incoherent attempts to rein in government regulation—particularly environmental regulation. However, I cannot say with any confidence that the currently composed Supreme Court will not push back against any current and future attempts to restrict fracking or otherwise address climate change.¹⁰³ It is entirely possible the Court will limit the availability of defenses to takings, including those centered on the public trust doctrine. Such a last gasp attempt to preserve both the status quo and interests of fossil fuel proponents would cause serious harm to future generations if not checked by available political remedies. Still, the Court’s conservative majority may attempt to thwart efforts aimed at addressing the urgent climate change crisis and the serious health and safety impacts of fracking.¹⁰⁴

Finally, it is important to consider use of the public trust doctrine as a sword (as a stimulus of government action) to address climate change and other impacts of fracking. Use of the public trust doctrine in this way does not mean that fracking can never be allowed by government in any place. However, it is essential for courts to state clearly that government as a sovereign has an obligation to protect public trust resources from harm for the benefit of trust beneficiaries (the public), particularly when the government’s own actions or authorization of private action causes or contributes to the harm. The public trust doctrine can thus be used in litigation, but a strong judicial ruling that supports applying public trust doctrine to fracking would benefit many for years to come. On a case-by-case basis, the public trust doctrine could be used to force government action and to address problems caused by fracking in areas where political actors would otherwise abdicate their fiduciary duties. This is an important role that judges, who are insulated from political forces as compared to elected officials, can play in our legal system. This does not mean judges will determine climate change policy

103. This assumes no further changes in Justices or responses to the lack of legitimacy of recent Supreme Court appointees.

104. Of course, this applies not only to fracking. As Professor Holly Doremus has noted, irrigators in California feel increasingly empowered to file takings claims when environmental restrictions threaten to reduce their available water supplies. Glen Martin, *Could the Feds Bigfoot California Over Water?*, CAL. MAG. (Mar. 13, 2018), <https://alumni.berkeley.edu/california-magazine/just-in/2018-03-13/could-feds-bigfoot-california-over-water> [https://perma.cc/D7P8-ETPZ].

for the country. Rather, judicial rulings may impose pressure on elected officials and agency experts to perform the hard work of balancing competing private and public interests.

Beyond litigation, a strong public trust doctrine applied to fracking may also be used in the administrative and legislative arenas. The public trust doctrine would add a strong argument in favor of public interest groups seeking, for example, greater environmental protections or limits on fossil fuel extraction and use. It would provide a strong argument for the notion that, at minimum, private parties should not be forced to extract oil and gas on their property. The doctrine may also provide an important tool for the public to combat the granting of permits to fracking facilities at the state level. It would provide even greater force when government-owned minerals are proposed for leasing, where such leasing would cause unacceptable harm to traditional public trust resources (e.g., oceans, rivers, and wildlife).

VI. CONCLUSION

The public trust doctrine is a venerable legal principle that recognizes a central role of government—state and federal—as both a sovereign and fiduciary. Some trust resources are inevitably used by the public as commons, and unchecked private exploitation of those resources makes everyone, even those exploiting the resources, worse off in the aggregate. Thus, government has an important and unique role as a fiduciary in protecting these resources. Longstanding recognition of certain public trust resources existed even before the United States—specifically oceans, rivers, wildlife, and the air. Fracking has the potential to impact each of those, either directly or indirectly through its long-recognized contributions to climate change. The public trust doctrine thus provides that state and federal governments have fiduciary obligations to restrict fracking so as to ultimately prevent harming public trust resources. The doctrine also insulates government regulation from takings liability when those regulations are fairly based on protecting public trust resources. Thus, state and federal courts should continue to recognize the public trust doctrine as an important background principle of law. Further, the courts should explicitly hold that fracking implicates public trust concerns, such that government-sanctioning of fracking necessarily contradicts governments' fiduciary obligations to protect trust resources for its beneficiaries—present and future members of the public alike. Anything less would enable private interests to frack the public trust, leaving present and future generations worse off.

