WHERE THE WATER MEETS THE SKY: HOW AN UNBROKEN LINE OF PRECEDENT FROM JUSTINIAN TO *JULIANA* SUPPORTS THE POSSIBILITY OF A FEDERAL ATMOSPHERIC PUBLIC TRUST DOCTRINE

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TABLE OF CONTENTS

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INTRODUCTION: THE YOUNG CLIMATE PLAINTIFFS

Climate change is reshaping the earth's landscape. As temperatures rise, so do the seas, which grow warmer and more acidic, bleaching coral reefs, corroding oyster shells, and choking out cold water fish as oxygen levels fall.[1] Hurricanes, fueled by warmer ocean waters, grow more powerful,[2] flatten coastal communities,[3] and destroy crops.[4] Forest fires ravage parched

1 *See* David Biello, *Fish Fin? How Climate Change is Hurting Cold Water Fish*, SCI. AM. (Jan. 4, 2007), https://www.scientificamerican.com/article/fish-fin-how-climate-chan/; *see also Ocean Acidification's Impact on Oysters and Other Shellfish*, NOAA PAC. MARINE ENVTL. LABORATORY, https://www.pmel.noaa.gov/co2/story/Ocean+Acidification%27s+impact+on+oysters+and+other+shellfish (last visited Nov. 2, 2018) [hereinafter NOAA, *Ocean Acidification*]; *see also* Michael Greshko, *Window to Save World's Coral Reefs Closing Rapidly*, NAT'L. GEOGRAPHIC (Jan. 4, 2018), https://news.nationalgeographic.com/2018/01/coral-bleaching-reefs-climate-change-el-nino-environment/.

2 *See Global Warming and Hurricanes: An Overview of Current Research Results*, NOAA GEOPHYSICAL FLUID DYNAMICS LABORATORY, https://www.gfdl.noaa.gov/global-warming-and-hurricanes/ (last visited Nov. 2, 2018) (noting that both sea surface temperatures and the power dissipation index have "risen sharply since the 1970s" and concluding that increased sea surface temperatures will likely lead to more intense tropical cyclones globally).

3 *See, e.g.*, *Hurricane Impacts on the Coastal Environment*, U.S. GEOLOGICAL SURV., https://pubs.usgs.gov/fs/hurricane-impacts/ (last visited Jan. 18, 2019).

lands in the western United States as the mountains' snow pack dwindles.[5]

In *Juliana v. United States*,[6] a group of young plaintiffs sued the federal government in the U.S. District Court for the District of Oregon for knowingly allowing greenhouse gas emissions to rise. The plaintiffs range in age from nine to twenty-two and hail from Oregon, Colorado, Pennsylvania, Alaska, Washington, Arizona, Louisiana, Hawaii, Florida, and New York.[7] As members of the youngest living generation, they are particularly vulnerable to the vicissitudes of climate change, both now and in the future.[8] The plaintiffs allege that rising greenhouse gas emissions are endangering the resources they depend on for food, agriculture, recreation, and religious and spiritual rituals.[9] They are also uniquely powerless to stop climate change through the normal political processes because at the time the lawsuit was filed, many of the youth plaintiffs could not vote or run for office because of their age.[10] The plaintiffs of *Juliana v. United States* have staked their claim on the idea that their generation and all future generations have a right to public trust resources, including the atmosphere and the climate.[11]

Juliana has led to a wave of youth climate cases. Youth plaintiffs have filed climate change lawsuits or rulemaking petitions in all fifty states.[12] Additionally, youth plaintiffs have brought or are preparing to bring legal action against the governments of Australia, Belgium, Canada, France, India, the Netherlands, Norway, Pakistan, the Philippines, Uganda, Ukraine,

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4 *See* Ashley Nickle, *Florida Questions Whether USDA Estimate Captures Extent of Irma Damage*, THE PACKER (Oct 12, 2017), https://www.thepacker.com/article/florida-citrus-growers-face-uphill-climb-after-irma.

5 *See* Kelly Erika Gleason, Forest Fire Effects on Radiative and Turbulent Fluxes Over Snow: Implications for Snow Hydrology 1–2 (May 6, 2015) (unpublished Ph.D. dissertation, Oregon State University), http://ir.library.oregonstate.edu/xmlui/handle/1957/55992.

6 217 F. Supp. 3d 1224 (D. Or. 2016).

7 *See Meet the Youth Plaintiffs*, OUR CHILDREN'S TRUST, https://www.ourchildrenstrust.org/meet-the-youth-plaintiffs/ (last visited Jan. 18, 2018).

8 *See* Complaint at ¶¶ 96–97, Juliana v. United States, 217 F. Supp. 3d 1224 (D. Or. 2016) (No. 6:15-cv-01517-TC) [hereinafter Juliana Complaint].

9 *See id.* at ¶¶ 16-90, 96–97.

10 *See id*.

11 *See id.* at ¶¶ 92, 96.

12 *See State Legal Actions*, OUR CHILDREN'S TRUST, https://www.ourchildrenstrust.org/state-legal-actions/ (last visited Oct. 31, 2018).

and the United Kingdom to demand science-based climate policy.[13] Youth plaintiffs are also organizing at the municipal level to pass science-based climate ordinances.[14] That being said, at this time, *Juliana* is the first such case to survive a motion to dismiss in federal court—on November 10, 2016, Judge Ann Aiken issued an opinion and order allowing the case to proceed to trial.[15]

In denying the government's motion to dismiss, Judge Aikens wrote, "this is no ordinary lawsuit."[16] Plaintiffs challenge government decisionmaking across a range of federal agencies responsible for energy, transportation, navigation, agriculture, commerce, the environment, and the military.[17] They raise novel issues of constitutional law, including the separation of powers, the scope and substance of unenumerated rights, and the nature of the public trust doctrine.[18] Plaintiffs allege violations of the Due Process clause of the Fifth Amendment, the Equal Protection guarantees of the Fourteenth and Fifth Amendments, unenumerated rights reserved by the people through the Ninth Amendment, and the public trust doctrine.[19]

This Article will focus on the public trust doctrine questions raised by *Juliana*. First, this Article summarizes the history of the public trust doctrine, tracing its origins from Roman law, through English case law, to American common law, where the doctrine evolved due to changes in social, economic, and scientific contexts. Second, this Article considers whether the atmosphere is a public trust resource and explores the application of the public trust doctrine beyond water to the atmosphere. Third, this Article examines whether, if the public trust doctrine can be extended, there is a *federal* atmospheric public trust doctrine. This Article argues that the connection between water and air supports the

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13 *See Global Legal Actions*, OUR CHILDREN'S TRUST, https://www.ourchildrenstrust.org/global-legal-actions/ (last visited Oct. 31, 2018).

14 *See Grassroots Legal Actions*, OUR CHILDREN'S TRUST, https://www.ourchildrenstrust.org/grassroots-legal-actions/ (last visited Oct. 31, 2018).

15 *See* Juliana v. United States, 217 F. Supp. 3d 1224 (D. Or. 2016). For an overview of the filings in *Juliana* to date, see *Major Court Orders and Filings*, OUR CHILDREN'S TRUST, https://www.ourchildrenstrust.org/court-orders-and-pleadings (last visited Feb. 6, 2019).

16 *Juliana*, 217 F. Supp. 3d at 1234.

17 *See generally* Juliana Complaint, *supra* note 8.

18 *See Juliana*, 217 F. Supp. 3d at 1237–38 (separation of powers), 1249–62 (unenumerated rights and public trust doctrine).

19 *See* Juliana Complaint, *supra* note 8, ¶¶ 277–310.

inclusion of atmosphere in the public trust doctrine, and that the federal government's control over territories, territorial seas, and certain navigable waters supports the existence of a federal public trust doctrine.

I. THE HISTORY OF THE PUBLIC TRUST DOCTRINE FROM ROMAN LAW THROUGH AMERICAN COMMON LAW

A. *The Origins of the Public Trust Doctrine in Roman Law and the Magna Carta*

The public trust doctrine has its roots in Roman law, where it was articulated in the Institutes of Justinian, which was part of a sixth century codification of Roman law under Emperor Justinian I.[20] The Institutes of Justinian describes the law as deriving from three sources: the law of nature (common to all living things and unchangeable), the law of nations (common to all humankind and prescribed by natural reason), and the civil law (common to all Romans and changeable).[21] The Institutes of Justinian also divides the law into the law of persons, the law of things, and the law of actions.[22]

The Institutes of Justinian situates the air, running water, the sea, and the shore within the law of things and the law of nature.[23] These resources were deemed inherently incapable of private ownership, not only in the context of Roman civil law, but also in the context of the immutable and inescapable law of nature. No human law could reduce the air, the running water, the sea, or the shore to private ownership.[24] The public trust doctrine, as articulated by the Institutes of Justinian in 533 C.E., transcends the vagaries of human history, governments, and laws.

The public trust doctrine was further developed in England, where the Magna Carta provided for the removal of fish weirs from English rivers in 1215.[25] Fish weirs were historically used to

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20 *See* INSTITUTES OF JUSTINIAN 78 (John T. Abdy & Bryan Walker trans., Cambridge Univ. Press 1876) (530 C.E.).

21 *See id.* at 3–12.

22 *See id.* at 12.

23 *See id.* at 78 ("By the law of nature these things are common to all men; air, running water, the sea, and consequently the shores of the sea.").

24 *See id.* ("No one therefore is debarred from approaching the sea-shore . . . because these are not subjects to the law of nations.").

25 *See The Text of the Magna Carta*, FORDHAM UNIVERSITY: INTERNET HISTORY SOURCEBOOKS PROJECT, https://sourcebooks.fordham.edu/halsall/

trap fish, but they also rendered rivers unnavigable and depleted the fish population by interfering with spawning and facilitating overfishing.[26] The Magna Carta represented a decision to preserve the navigability of rivers and the local fish population for the benefit of the public. Notably, the king's own fish weirs were not exempt under the Magna Carta, which represented a check on the sovereign's right to exploit natural resources to the detriment of the public.[27]

English common law built upon the foundation of the Magna Carta and Roman law, upholding the public's right to common natural resources. In *Free Fishers of Whitstable v. Gann*, the proprietors of an oyster fishery sued to enforce anchoring fees on passing ships, arguing that the Crown had granted them title to the submerged lands.[28] The court ruled that, under English common law, the sovereign held title to the bed of all tidal rivers, estuaries, and territorial seas for the benefit of the subjects.[29] More specifically, the court explained that this title was subject to the public right of navigation; if the Crown granted title of the submerged lands to a private entity, that title was also subject to the public right of navigation, and no fishery owner could interfere with this right.[30] Furthermore, the court held that no anchorage fees could be charged due to this public right.[31]

B. *The Public Trust Doctrine Comes to America*

The public trust doctrine passed from English common law into American common law, where the doctrine expanded and developed further.[32] One of the earliest expositions of the public

source/magnacarta.asp (last visited Nov. 5, 2018) (providing the text of MAGNA CARTA § 33 (G.R.C. Davis trans., British Library rev. ed. 1989) (1215)).

26 *See* THE LISLE LETTERS: AN ABRIDGEMENT 140 (Muriel Saint Clare Byrne ed., 1981).

27 *See* FORDHAM UNIVERSITY: INTERNET HISTORY SOURCEBOOKS PROJECT, *supra* note 25.

28 *See* Free Fishers of Whitstable v. Gann (1865), 11 Eng. Rep. 1305 (HL) [1, 9–10].

29 *See id.* at [13–15]; *see also* Bradley Freedman & Emily Shirley, *England and the Public Trust Doctrine*, J. PLAN. & ENV'T LAW 839, 841 (2014).

30 *See* Free Fishers of Whitstable v. Gann (1865), 11 Eng. Rep. 1305 (HL) [13–14].

31 *See id.* at 27.

32 *See, e.g.*, Carson v. Blazer, 2 Binn. 475 (Pa. 1810); Cates' Ex'rs v. Wadlington, 1 McCord 580 (S.C. 1822); Bullock v. Wilson, 2 Port. 436 (Ala. 1835); Collins v. Benbury, 3 Ired. 277 (N.C. 1842).

trust doctrine in American common law occurred in *Arnold v. Mundy*, an 1821 New Jersey trespassing case brought by the proprietor of an oyster bed in navigable waters.[33] The court ruled that the proprietor had no right to maintain a trespass action against other people who attempted to harvest the oysters.[34] The Supreme Court of New Jersey wrestled with the very nature of the ownership of navigable rivers.[35] The plaintiff argued that the Magna Carta, which barred the sovereign from blocking the public's right of fishing and navigation in royal rivers, was local to England.[36] The plaintiff further argued that when King Charles II granted the colony of New Jersey to the Duke of York, who in turn granted it to New Jersey's original proprietors, he included within the grant all rivers, with no restriction on the Duke's power to grant or alienate the rivers or the right to fish in them.[37] They maintained that the rights and possessions of the 1664 grant underlie all title to property, including the plaintiff's title.[38]

In rejecting plaintiff's argument, Chief Justice Kirkpatrick gave a rousing defense of America's legal heritage in the form of the law of nature (articulated by Institutes of Justinian in the context of property), the civil law (common to most of Western civilization), and the English common law:

> By the law of nature, which is the only true foundation of all the social rights, that by the civil law, which formerly governed almost all the civilized world, and which is still the foundation of the polity of almost every nation in Europe; that by the common law of England, of which our ancestors boasted, and to which it were well if ourselves paid a more sacred regard; I say I am of opinion, that, by all these, the navigable rivers, where the tide ebbs and flows, the ports, the bays, the coasts of the sea, including both the water and the land under the water, for the purposes of passing and repassing, navigation, fishing, fowling, sustenance, and all the other uses of the water and its products (a few things which belonged to the king in his private right, and for his own use only excepted) are common to all the people, and that each has a right to use them according to his

33 *See* Arnold v. Mundy, 6 N.J.L. 1, 1–2 (1821).
34 *See id.* at 1.
35 *See id.* at 11–13.
36 *See id.* at 5–6.
37 *See id.* at 4–7.
38 *See id.* at 6.

> pleasure, subject only to the laws which regulate that use; that the property indeed vests in the sovereign, but it vests in him for the sake of order and protection, and not for his own use, but for the use of the citizen. . . .[39]

As to the Magna Carta itself, the Chief Justice believed that the charter restored the common law right of the people to fish and navigate without interference from fishing weirs constructed by the recipients of the king's favoritism, and that since the time of the Magna Carta, no king of England has had the power of granting away those rights, at any time or any place.[40] The Chief Justice explained that when the king took possession of New Jersey, he did so in his sovereign capacity, with the same rights and power over it as of his other domains.[41] Thus, the court held, the Magna Carta, and its protection of the common law rights of fishing and navigation, arrived with full force and power in the English colonies of the New World. After the American Revolution, these royal rights vested in the people, as the sovereign of the country, with specific limitations on sovereign power: the people could fish, navigate, or plant oysters, but they could not "make a direct and absolute grant, divesting all the citizens of their common right; such a grant, or a law authorizing such a grant, would be contrary to the great principles of our constitution."[42]

The court distinguished between sovereign ownership for the sovereign's personal use (or, for purposes of state) and sovereign ownership for the purpose of holding a resource in trust for the common use and enjoyment of the people.[43] Sovereign ownership of natural resources held under the public trust came with restrictions and responsibilities as well as rights: the sovereign could not dispose of these natural resources in such a way as to prevent the public from enjoying them.[44] Moreover, when the ports, bays, and coasts were passed from King Charles II to the

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39 *Id.* at 11–12.

40 *See id.* at 12.

41 *See id.* at 13 (explaining that when the English settlers arrived on the shores of New Jersey, they "came over here clothed with all the essential rights and privileges secured to the subject by the British Constitution").

42 *Id.* at 13.

43 *See id.* at 1–2, 12–13.

44 *See* Freedman & Shirley, *supra* note 29, at 842; *see also* Arnold v. Mundy 6 N.J.L. 1, 1–2 (1821).

Duke of York and later to the proprietors of New Jersey, it was not for the governor's own use, but to exercise the royal authority on behalf of and for the benefit of the people.[45] These principles survived the Revolutionary War, with the rights to these resources vesting in the people of New Jersey as the sovereign.[46]

Arnold shows the survival and seamless transfer of the public trust doctrine from English to American common law after the Revolution. The case is remarkable for its affirmation of the continued validity of the Magna Carta in American law, and the public trust doctrine itself.

Two important distinctions emerged between the public trust doctrine as it existed in eighteenth-century England and the public trust doctrine as it developed in the newly-independent United States. First, the sovereign was redefined as the people rather than the Crown, with rights vesting in the public.[47] This democratic reinterpretation of the English common law doctrine laid the groundwork for ordinary citizens to sue for access to or preservation of public resources.[48]

Second, courts in the United States quickly clarified that all navigable rivers belonged to the public trust, whereas the English doctrine only applied to "royal rivers" that were subject to the ebb and flow of the tide.[49] In 1810, the Supreme Court of Pennsylvania considered whether a riparian property owner had the right to an exclusive shad fishery in the Susquehanna River in *Carson v. Blazer*.[50] While the Susquehanna River was not a tidal river, the court ruled that "such rivers are navigable, although there is no flow and reflow of the tide, and they belong to the common wealth,"[51] explaining that the colonies (which later became the states) adopted English common law, but only the portions that

45 *See Arnold*, 6 N.J.L. at 1–2.

46 *See id.*

47 *See id.* at 13.

48 *See, e.g.*, Barney v. City of Keokuk, 94 U.S. 324, 333 (1876) ("By the American Revolution, the people of each State, in their sovereign character, acquired the absolute right to all their navigable waters and the soil under them.").

49 *See, e.g.*, Carson v. Blazer, 2 Binn. 475 (Pa. 1810); Cates' Ex'rs v. Wadlington, 1 S.C.L. 580, 582 (S.C. 1822); Bullock v. Wilson, 2 Port 436, 445–48 (Ala. 1835); Collins v. Benbury, 3 Ired. 277, 285 (N.C. 1842).

50 *See Carson*, 2 Binn. 475.

51 *Id.* at 475, 479.

were applicable to local conditions.[52] The Constitutional Court of Appeals of South Carolina also held that "[the English] rule will not do in this state, where our rivers are navigable several hundred miles above the flowing of the tide."[53] In 1835, the Supreme Court of Alabama reaffirmed that navigable waters are "common or public highways" in this country, adding that both Congress and the Alabama state legislature had passed statutes to clarify this point.[54] In 1842, the Supreme Court of North Carolina held that the public had the right to fish in navigable waters.[55]

The U.S. Supreme Court followed the lead of the state courts in *Barney v. Keokuk*, solidifying the position that all navigable waters in the United States are public trust resources owned in common by the people.[56] By 1876, the year *Barney* was decided by the Supreme Court, the matter was settled in favor of including all navigable waters within the scope of the public trust:

> It appears to be the settled law of that State that the title of the riparian proprietors on the banks of the Mississippi extends only to ordinary high-water mark, and that the shore between high and low water mark, as well as the bed of the river, belongs to the State. This is also the common law with regard to navigable waters; although, in England, no waters are deemed navigable except those in which the tide ebbs and flows. *In this country, as a general thing, all waters are deemed navigable which are really so*; and especially it is true with regard to the Mississippi and its principal branches. . . . The above conclusion was reached, and has always been adhered to in that State.[57]

Furthermore, in 1892, the U.S. Supreme Court held that the public trust doctrine applies to the land beneath the navigable waters of the Great Lakes.[58] In his opinion in *Illinois Central Railroad Co. v. Illinois*, Justice Field emphasized the similarity of the Great Lakes

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52 *See id.* at 484 ("[T]he uniform idea has ever been, that only such parts of the common law as were applicable to our local situation have been received in this government.").

53 *Cates' Ex'rs*, 1 S.C.L. at 582.

54 *Bullock*, 2 Port. at 444.

55 *See* Collins v. Benbury, 3 Ired. 277, 285 (N.C. 1842).

56 *See* Barney v. City of Keokuk, 94 U.S. 324, 333 (1876).

57 *Id.* at 337–38 (emphasis added).

58 *See* Ill. Cent. R.R. Co. v. Illinois, 146 U.S. 387, 435 (1892).

to the open seas and reaffirmed that, in the American context, navigability trumps tides and salt water.[59] In rejecting the Illinois legislature's decision to cede title and control of much of the Chicago harbor lakebed to a private railroad company, Justice Field emphasized that the state's title in lands under the navigable waters of Lake Michigan is held in trust for the people, so that they can freely navigate, fish, and engage in commerce.[60]

By the late nineteenth century, American courts had adapted the public trust doctrine to the American context. Public trust resources were held by the state for the people.[61] And all navigable waters, including non-tidal rivers and the Great Lakes, were subject to the public trust.[62]

C. *The Expansion of the Public Trust Doctrine in American Courts*

From the late nineteenth century to the present day, American courts have expanded the public trust doctrine from navigable waters to resources *related* to navigable waters. They also expanded the public trust doctrine from the traditional rights of navigation and fishing to encompass the ever-changing conditions and needs of the public it was created to benefit.[63] Thus, recreational and shore activities, swimming, natural beauty and aesthetics, preservation, and the eradication of pollution have all come under the umbrella of the public trust.[64]

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59 *See id.* at 436–37.

60 *See id.* at 452 ("[The state's title in lands under Lake Michigan is] a title held in trust for the people of the State, that they may enjoy the navigation of the waters, carry on commerce over them, and have liberty of fishing therein freed from the obstruction or interference of private parties.").

61 *See* Arnold v. Mundy, 6 N.J.L. 1, 13 (1821).

62 *See Ill. Cent. R.R. Co.*, 146 U.S. at 435 (1892) (finding that the Great Lakes are subject to the public trust); Barney v. City of Keokuk, 94 U.S. 324, 333 (1877) (finding that the Mississippi River was subject to the public trust).

63 *See In re* Water Use Permit Applications, 9 P.3d 409, 425 (Haw. 2000) (groundwater); Robinson Twp. v. Commonwealth, 83 A.3d 901, 955 (Pa. 2013) (plurality opinion) (air).

64 *See* Caminiti v. Boyle, 732 P.2d 989, 994 (Wash. 1987) (citing Wilbour v. Gallagher, 462 P.2d 232 (Wash. 1969)) (noting that the *jus publicum* interest is the right "of navigation, together with its incidental rights of fishing, boating, swimming, water skiing, and other related recreational purposes generally regarded as corollary to the right of navigation and the use of public water"); *see also* Borough of Neptune City v. Borough of Avon-by-the-Sea, 294 A.2d 47, 54 (N.J. 1972) ("We have no difficulty in finding that, in this latter half of the twentieth century, the public rights in tidal lands are not limited to the ancient

American courts have expanded the public trust doctrine from navigable waters generally[65] to wildlife,[66] recreation,[67] dry sand beaches,[68] wetlands,[69] tributaries,[70] groundwater,[71] and air.[72] In so doing, they have relied on the history of the doctrine itself,[73] changing social priorities,[74] and emerging science.[75] The courts have adopted a flexible and expansive reading of the public trust doctrine, under the theory that "[the] public trust doctrine, like all common law principles, should not be considered fixed or static,

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prerogatives of navigation and fishing, but extend as well to recreational uses, including bathing, swimming and other shore activities."); Just v. Marinette Cty, 201 N.W.2d 761, 768 (1972) ("The active public trust duty of the state of Wisconsin in respect to navigable waters requires the state not only to promote navigation but also to protect and preserve those waters for fishing, recreation, and scenic beauty.").

65 *See, e.g.*, Carson v. Blazer, 2 Binn. 475 (Pa. 1810); Cates' Ex'rs v. Wadlington, 1 S.C.L. 580 (S.C. 1822); Bullock v. Wilson, 2 Port 436 (Ala. 1835); Collins v. Benbury, 3 Ired. 277 (N.C. 1842); *see also Barney*, 94 U.S. 324. These cases are discussed at length above.

66 *See* Geer v. Connecticut, 161 U.S. 519, 519 (1896) (wildlife).

67 *See Caminiti*, 732 P.2d at 994 (citing *Wilbour*, 462 P.2d 232); *see also Borough of Neptune City* 294 A.2d at 54.

68 *See* Matthews v. Bay Head Improvement Ass'n, 471 A.2d 355 (N.J. 1984) (dry sand beaches).

69 *See* Just v. Marinette Cty., 201 N.W.2d 761 (Wis. 1972) (wetlands).

70 *See* Nat'l Audubon Soc'y v. Superior Ct. of Alpine Cty., 658 P.2d 709 (Cal. 1983) (en banc) (tributaries).

71 *See In re* Water Use Permit Applications, 9 P.3d 409, 425 (Haw. 2000) (groundwater).

72 *See* Robinson Twp. v. Commonwealth, 83 A.3d 901, 955 (Pa. 2013) (plurality opinion) (air).

73 *See, e.g.*, *Matthews*, 471 A.2d at 360:

> In *Borough of Neptune City v. Borough of Avon-by-the-Sea*. . . Justice Hall alluded to the ancient principle "that land covered by tidal waters belonged to the sovereign, but for the common use of all the people." The genesis of this principle is found in Roman jurisprudence, which held that "'[b]y the law of nature' 'the air, running water, the sea, and consequently the shores of the sea,' were common to mankind. No one was forbidden access to the sea, and everyone could use the seashore "to dry his nets there, and haul them from the sea . . . ." The seashore was not private property, but 'subject to the same law as the sea itself, and the sand or ground beneath it.' *This underlying concept was applied in New Jersey in Arnold v. Mundy, 6 N.J.L. 1 (Sup. Ct. 1821).*

(citations omitted) (citing INSTITUTES OF JUSTINIAN, *supra* note 20) (emphasis added).

74 *See, e.g.*, Borough of Neptune City v. Borough of Avon-by-the-Sea, 294 A.2d 47, 54 (N.J. 1972).

75 *See* In re *Water Use Permit Applications*, 9 P.3d at 426 (internal citations omitted).

but should be molded and extended to meet the changing conditions and needs of the public it was created to benefit."[76] At the same time, the courts have remained grounded in the origins of the public trust doctrine, with frequent references to the Institutes of Justinian, the Magna Carta, and natural law even in the most groundbreaking twentieth- and twenty-first-century cases.[77] A discussion of the most salient cases for purposes of the expansion of the public trust doctrine follows below.

At the end of the nineteenth century, the U.S. Supreme Court considered whether the state of Connecticut could ban the removal of lawfully-killed wildlife from the state in *Geer v. Connecticut*.[78] After an exhaustive survey of the nature of property in animals *ferae naturae*, from ancient Greek and Roman law to the Napoleonic Codes and English common law, Justice White turned to the question of how to apply this "unbroken line of law and precedent" in America.[79] He noted the long history of sovereigns controlling the taking and destruction of wildlife: neither common ownership nor ownership by "no one" is a license to take without limit.[80] Then he declared:

> Undoubtedly, this attribute of government to control the taking of animals ferae naturae, which was thus recognized and enforced by the common law of England, was vested in the colonial governments. . . . It is also certain that the power which the colonies thus possessed passed to the states with the separation from the mother country, and remains in them at the present day, in so far as its exercise may not be incompatible with, or restrained by, the rights conveyed to the federal government by the constitution.[81]

While the government's power to regulate the taking of wildlife was grounded in English common law, the sovereign's power was understood differently in the context of the United States. In a government of and for the people, the sovereign was meant to

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76 *Borough of Neptune City*, 294 A.2d at 54.

77 *See, e.g.*, Nat'l Audubon Soc'y v. Superior Court, 658 P.2d 709, 712 (Cal. 1983); *Borough of Neptune City*, 294 A.2d at 53–55.

78 *See* Geer v. Connecticut, 161 U.S. 519, 522 (1896).

79 *Id.* at 526.

80 *Id.* at 525–26.

81 *Id.* at 527–28.

exercise its power over common property "as a trust for the benefit of the people, and not as a prerogative for the advantage of the government as distinct from the people. . . ."[82] Justice White also found that the public trust is not only a right but a duty:

> It is, perhaps, accurate to say that the ownership of the sovereign authority is in trust for all the people of the state; and hence, by implication, it is the duty of the legislature to enact such laws as will best preserve the subject of the trust, and secure its beneficial use in the future to the people of the state.[83]

Although the Supreme Court overruled *Geer* in *Hughes v. Oklahoma*[84] in 1979, it did not strike a fatal blow to the inclusion of wildlife in the public trust.[85] Writing for the majority in *Hughes*, Justice Brennan found that an Oklahoma statute, which prohibited transporting minnows for sale outside the state, was "repugnant to the commerce clause" and thus unconstitutional.[86] Justice Brennan appeared chiefly concerned with the prospect of economic balkanization and discrimination against citizens of other states, concerns the founding fathers had sought to preempt through the commerce clause.[87] *Geer* had defended the Connecticut statute banning the interstate transport of wild game for sale from a

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82 *Id.* at 529.

83 *Id.* at 534.

84 *See* Hughes v. Oklahoma, 441 U.S. 322 (1979).

85 Indeed, courts continued to cite *Geer* in public trust doctrine cases even after *Hughes.* Some courts cite *Geer* without any reference to *Hughes. See, e.g.*, Singer v. Twp. of Princeton 860 A.2d 475, 481 (N.J. Sup. Ct. App. Div. 2004); State v. Bartree, 894 S.W.2d 34, 41 (Tex. App. 1994); McDowell v. State, 785 P.2d 1, 11 (Alaska 1989); Cal. Trout, Inc. v. State Water Res. Control Bd., 255 Cal. Rptr. 184, 212 (Cal. Ct. App. 1989); Ridenour v. Furness, 504 N.E.2d 336, 339 n.3 (Ind. Ct. App. 1987); Cont'l Ins. Cos. v. Ne. Pharm. and Chem. Co., Inc., 811 F.2d 1180, 1186 n.13 (8th Cir. 1987); United States v. Tomlinson, 574 F. Supp. 1531, 1535 (D. Wyo. 1983); Louisiana v. Baldridge, 538 F. Supp. 625, 629 (E.D. La. 1982). Some courts go so far as to affirm the property and ownership theory of wild animals, even after *Hughes*. *See, e.g., Cont'l Ins. Cos.*, 811 F.2d at 1186 n.13; *Tomlinson*, 574 F. Supp. at 1535. Other courts construe *Hughes* narrowly, stating that *Geer* is overruled on grounds other than the public trust doctrine. *See, e.g.*, People v. Rinehart, 377 P.3d 818, 823 n.3 (Cal. 2016); State v. Dickerson, 345 P.3d 447, 455 (Ore. 2015) (en banc); Mountain States Legal Found. v. Hodel, 799 F.2d 1423, 1426 n.5 (10th Cir. 1986)).

86 *Hughes*, 411 U.S. at 338.

87 *See id.* at 325–35 for an extended discussion of the commerce clause.

commerce clause challenge on the grounds that the game never entered the stream of inter-state commerce.[88] *Hughes* rejected that rationale, as well as *Geer*'s affirmation of the state's entitlement to wildlife.[89] Ignoring centuries of Roman law, European feudal law, English common law, and American common law, Justice Brennan dismissed the concept of public ownership in wildlife as a "19th-century legal fiction."[90] The Court did, however, recognize this ownership as a form of "legal shorthand of the importance to its people that a State have power to preserve and regulate the exploitation of an important resource."[91] Provided that a state does not violate the commerce clause or the privileges and immunities clause of the Constitution, nothing in *Hughes* prevents a state from protecting wildlife under the public trust doctrine or the police powers doctrine.[92]

In the 1970s and 1980s, American courts expanded the public trust doctrine to protect new *uses* as well as new resources.[93] In *Borough of Neptune City v. Borough of Avon-by-the-Sea*, the Supreme Court of New Jersey ruled that recreation in public waters is protected by the public trust doctrine.[94] Justice Hall, writing for the majority, endeavored to approach the case from the "viewpoint of the modern meaning and application of the public trust doctrine."[95] After summarizing the history of the public trust doctrine from its Roman roots to modern times, the Justice examined the public trust doctrine in the context of the latter half of the twentieth century, when public beaches had become crowded by a growing population and squeezed by the proliferation of water-dependent industries. In this context, "[the court had] no difficulty in finding that, in this latter half of the twentieth century, the public rights in tidal lands [were] not limited to the ancient prerogatives of navigation and fishing, but

88 *See id.* at 327.

89 *See id.* at 322.

90 *Id.* at 334–36.

91 *Id.* at 334 (internal citation omitted).

92 *See id.* at 335–336 ("[T]he general rule we adopt in this case makes ample allowance for preserving, in ways not inconsistent with the Commerce Clause, the legitimate state concerns for conservation and protection of wild animals underlying the 19th-century legal fiction of state ownership.").

93 *See* Borough of Neptune City v. Borough of Avon-By-The-Sea, 294 A.2d 47, 54 (N.J. 1972).

94 *See id.*

95 *Id.* at 51.

extend[ed] as well to recreational uses, including bathing, swimming and other shore activities."[96] Justice Hall declared that "[the] public trust doctrine, like all common law principles, should not be considered fixed or static, but should be molded and extended to meet changing conditions and needs of the public it was created to benefit."[97] This latter declaration opened the door for an expansive reading of the public trust doctrine molded to the needs and priorities of modern society.

In *Matthews v. Bay Head Improvement Association*, the Supreme Court of New Jersey considered whether the public trust encompasses the use of dry sand areas as reasonably necessary to access the ocean.[98] Justice Schreiber, writing for the court, cited the Institutes of Justinian and directly connected the ancient Roman law to *Arnold*, discussed *supra*, one of the first public trust cases to be heard in New Jersey.[99] In order to exercise the rights of navigation, fishing, bathing, swimming, and other shore activities, "the public must have access to municipally-owned dry sand areas as well as the foreshore."[100] The extension of the public trust doctrine to include municipally-owned dry sand areas was necessitated by the court's conclusion in *Borough of Neptune* that enjoyment of rights in the foreshore is inseparable from use of dry sand beaches.[101] The court determined that reasonable access, even over privately-owned dry sand beaches, may be necessary to safeguard the public trust doctrine's public right to swim in the ocean and use the foreshore in connection therewith.[102] In *Matthews*, the court ruled that local conditions required the association to permit public access to its dry sand beaches.[103]

In *Caminiti v. Boyle*, the Supreme Court of Washington considered the constitutionality of a state statute allowing private land owners to build and maintain private recreational docks on or over state-owned tidelands and shorelands.[104] After tracing the

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96 *Id.* at 54.

97 *Id.*

98 *See* Matthews v. Bay Head Improvement Ass'n, 471 A.2d 355 (N.J. 1984); *see also supra* note 73 and corresponding text.

99 *See Matthews*, 471 A.2d at 360.

100 *Id.* at 363.

101 *See id.* at 360.

102 *See id.* at 364–65.

103 *See id.* at 368.

104 *See* Caminiti v. Boyle, 732 P.2d 989, 991 (Wash. 1987).

history of the public trust doctrine from its Justinian roots and noting that Washington's constitution codifies the state's title and right to the beds of navigable waters,[105] Justice Andersen delved into the nature of the state's ownership of these resources.[106] He distinguished between two aspects of the state's ownership: *jus privatum* (right of private ownership) and *jus publicum* (right of public ownership), the latter of which is inalienable and carries an obligation to exercise dominion over the tidelands and shorelands in trust for the public.[107] He noted that, although the state may convey title to tidelands and shorelands, it cannot convey or give away the *jus publicum* interests.[108] The test for whether or not the public trust doctrine has been violated consists of determining whether the state has given up its right of control over the *jus publicum* and, if so, whether the interests of the public in the *jus publicum* have been substantially impaired.[109] Ultimately, Justice Andersen held that recreation facilitated by private docks is a beneficial use of public tidelands and shorelands and therefore consistent with the state's public trust doctrine.[110] The U.S. Supreme Court declined to hear the case, allowing this interpretation to stand.[111]

In *Glass v. Goeckel*, the Supreme Court of Michigan considered whether the public trust doctrine protected the public's right to walk the shores of the Great Lakes.[112] Writing for the majority, Justice Corrigan held that such a right was protected, because walking was necessary to exercise the traditional public trust rights of navigation, hunting, and fishing.[113] The Justice found that the scope of the public trust on the Great Lakes shoreline extended to the ordinary high-water mark, not just currently submerged land.[114] Drawing a fine distinction between *jus privatum* and *jus publicum*,[115] Justice Corrigan ruled that, even where riparian property owners' property rights extended to the

105 *See id.* at 994.
106 *See id.* at 995–96.
107 *See id.*
108 *See id.*
109 *See id.*
110 *See id.* at 997.
111 *See* Caminiti v. Boyle, 484 U.S. 1008 (1988) (denying certiorari).
112 *See* Glass v. Goeckel, 703 N.W.2d 58, 61 (Mich. 2005).
113 *See id.* at 674–75.
114 *See id.* at 690–91.
115 *See id.* at, 679–81, 684, 687–89.

water's edge, property owners held title to the land between the water and the ordinary high-water mark subject to the public trust doctrine.[116]

Meanwhile, courts were also expanding the public trust doctrine to encompass natural resources that were closely connected to the quality and quantity of navigable waters. In *Just v. Marinette County*, the Supreme Court of Wisconsin considered whether a shoreline protection ordinance was an unconstitutional constructive taking of private land.[117] The shoreline protection ordinance forbade the fill, drainage, or dredging of wetlands without a permit, defining shorelands as lands within one thousand feet of the normal high-water elevation of navigable lakes, ponds, or flowages and three hundred feet from a navigable river or stream or to the landward side of the flood plain, whichever is greater.[118] The purpose of the ordinance was to protect navigable waters from the degradation that results from unlimited use of the wetlands.[119] Chief Justice Hallows found the ordinance to be a valid exercise of the legislature's duties under the public trust doctrine because of the relationship between wetlands and navigable waters:

> The state of Wisconsin under the trust doctrine has a duty to eradicate the present pollution and to prevent further pollution in its navigable waters. What makes this case different from most condemnation or police power zoning cases is the interrelationship of the wetlands, the swamps and the natural environment of shorelands to the purity of the water and to such natural resources as navigation fishing and scenic beauty.[120]

In *National Audubon Society v. Superior Court of Alpine County*, the Supreme Court of California considered whether the public trust doctrine encompassed non-navigable tributaries flowing into Lake Mono, a navigable saline lake with significant ecological, recreational, aesthetic, and wildlife values.[121] Justice Brossard

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116 *See id.* at 687–89.

117 *See* Just v. Marinette Cty., 201 N.W.2d 761, 767 (Wis. 1972).

118 *See id.* at 764.

119 *See id.* at 765.

120 *See id.* at 768.

121 *See* Nat'l Audubon Soc'y v. Superior Ct. of Alpine Cty., 658 P.2d 709 (Cal. 1983) (en banc).

discussed the purpose and scope of the public trust doctrine, as well as the powers and duties of the state as trustee of the public trust.[122] Noting that the objective of the public trust doctrine has evolved with society and that California courts have ruled that the doctrine's uses are not limited to the traditional trifecta of commerce, navigation and, fishing, the Justice wrote, "there is a growing public recognition that one of the most important public uses of the tidelands—a use encompassed within the tidelands trust—is the preservation of those lands in their natural state."[123] Justice Brossard concluded that California's public trust doctrine "protects navigable waters from harm caused by diversion of nonnavigable tributaries."[124]

At the turn of the twenty-first century, the Supreme Court of Hawaii considered the applicability of the public trust doctrine to groundwater in *In re Water Use Permit Applications*.[125] Justice Nakayama, writing for the majority, surveyed the historical development of the public trust doctrine in Hawaii, from case law to the inclusion of the public trust doctrine in Hawaii's constitution.[126] In her examination of the scope of the public trust doctrine, she too referenced the Institutes of Justinian, English common law, American common law, and Hawaii's constitution.[127] Without defining the full extent of public resources held in trust by the state for the benefit of its people, she reaffirmed that under the Hawaiian constitution and the sovereign reservation, "the public trust doctrine applies to all water resources without exception or distinction."[128] Her opinion was informed by modern science, "which has discredited the surface-ground dichotomy," and the malleability of the public trust which "does not remain fixed for all time, but must conform to changing needs and circumstances."[129] The court also held "that the maintenance of waters in their natural state constitutes a distinct 'use' under the water resources trust."[130]

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122 *See id.* at 719–24.
123 *Id.* at 719 (citing Marks v. Whitney, 491 P.2d 374 (Cal. 1971)).
124 *Id.* at 721.
125 *See In re* Water Use Permit Applications, 9 P.3d 409, 425 (Haw. 2000).
126 *See id.* at 439–42.
127 *See id.* at 445.
128 *Id.*
129 *Id.* at 447.
130 *Id.* at 448.

More recently, in *Robinson Township v. Commonwealth*, the Supreme Court of Pennsylvania considered the applicability of the public trust doctrine to air.[131] Writing for the court, Chief Justice Castille held that, under the Environmental Rights Amendment to Pennsylvania's constitution, the public trust encompassed Pennsylvania's public natural resources, including "not only state-owned lands, waterways, and mineral reserves, but also resources that implicate the public interest, such as ambient air, surface and ground water, wild flora, and fauna (including fish) that are outside the scope of purely private property."[132] In so holding, Justice Castille referenced the legislative history of the amendment, as well as Pennsylvania's long history of despoiling natural resources, in his interpretation of the public trust as codified in Pennsylvania's Environmental Rights Amendment to the Constitution.[133]

II. ATMOSPHERE AS A PUBLIC TRUST RESOURCE

A. *U.S. Courts' Reliance on Justinian Implies that Air is a Public Trust Resource*

The development of the public trust doctrine in the American system has been driven by scientific discovery and social changes, and is supported by the doctrine's early Roman roots.[134] As new information has emerged, American courts have heavily relied on the common law's responsiveness to the specific facts and circumstances presented by actual cases and controversies.[135] Judges have seamlessly integrated modern science with ancient doctrine, expanding and refining the public trust doctrine in accordance with the modern public interest.[136] The courts have, in

131 *See* Robinson Twp. v. Commonwealth, 83 A.3d 901, 954–56 (Pa. 2013).

132 *See id.* at 954–55.

133 *See id.* at 954–63.

134 *See supra* Section I.C.; *see, e.g.*, Matthews v. Bay Head Improvement Ass'n, 471 A.2d 355, 360 (N.J. 1984); Borough of Neptune City v. Borough of Avon-by-the-Sea, 294 A.3d 47, 54 (N.J. 1972); *In re* Water Use Permit Applications, 9 P.3d 409 (Haw. 2000).

135 *See supra* Section I.C.; *see also, e.g.*, *Borough of Neptune City*, 294 A.2d at 54 ("The public trust doctrine, like all common law principles, should not be considered fixed or static, but should be molded and extended to meet changing conditions and needs of the public it was created to benefit.").

136 *See, e.g.*, Carson v. Blazer, 2 Binn. 475 (Pa.1810); Cates' Ex'rs v. Wadlington, 1 S.C.L. 580 (S.C.1822); Bullock v. Wilson, 2 Port. 436 (Ala.1835); Collins v. Benbury, 3 Ired. 277 (N.C. 1842); *see also* Barnaby v. Keokuk, 94

the words of Justice Hall in *Borough of Neptune*, molded and extended the doctrine to "meet the changing conditions and needs of the public it was created to benefit."[137]

The expansion of the public trust doctrine beyond navigable waters is also supported by the doctrine's ancient roots. When the doctrine was first articulated in the Institutes of Justinian in 530 C.E., it included air as well as common aquatic resources: "[b]y the law of nature these things are common to mankind—the air, running water, the sea, and consequently the shores of the sea."[138] This text has been cited verbatim by American courts from the American Revolution to the present.[139]

For example, in *Geer*, Justice White referred to an "unbroken line of law and precedent" stretching back to the Institutes of Justinian.[140] Although Justice Brennan would later dismiss this body of law as a mere "legal fiction"[141] in *Hughes v. Oklahoma*, a

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U.S. 324 (1877); Geer v. Connecticut, 161 U.S. 519 (1896) (wildlife); *Matthews*, 471 A.2d 355 (dry sand beaches); Just v. Marinette Cty., 201 N.W.2d 761 (Wis. 1972) (wetlands); *Borough of Neptune City*, 294 A.2d at 54; Nat'l Audubon Soc'y v. Superior Ct. of Alpine Cnty., 658 P.2d 709 (Cal. 1983) (en banc) (tributaries); Caminiti v. Boyle, 732 P.2d 989, 994 (Wash. 1987); In re *Water Use Permit Applications*, 9 P.3d 409 (groundwater); *Robinson Twp*, 83 A.3d at 955 (air).

137 *See, e.g.*, *Borough of Neptune City*, 294 A.2d at 54.

138 INSTITUTES OF JUSTINIAN, *supra* note 20, at 78.

139 *See, e.g.*, *Geer*, 161 U.S. at 522–23; Arnold v. Mundy, 6 N.J.L. 1, 11–13 (1821); *Borough of Neptune City*, 294 A.2d at 54. As Samuel J. Astorino, *Roman Law in American Law: Twentieth Century Cases of the Supreme Court*, 40 DUQ. L. REV. 627 (2002) explains:

> In sum, Roman law was an integral part of the larger jurisprudential process by which American jurists reached back to find a line of argument to be employed in understanding the case . . . if Roman law is isolated in its role, its impact becomes almost negligible in American legal practice. On the other hand, if its role is considered in the context of a more inclusive historical analysis that employed English, canon, and civil laws as well, then Roman law looms larger as a starting point for an explanatory chain leading from the past to the present. . . .
>
> [I]n some instances, it is clear that the opinions seemed to be reaching for Roman law as a possible accumulation of authority, or even as gap fillers, or indeed as precedent in rare cases involving the lands acquired by expansion, particularly from the Philippines and Puerto Rico, where it was necessary to decide the content of legal rules in effect at the time of conquest. . . .
>
> [B]orrowing law from other sources is often the most fruitful method by which law develops.

Id. at 627–28, 652, 653.

140 *Geer*, 161 U.S. at 526.

141 Hughes v. Oklahoma, 441 U.S. 322, 335 (1979).

1979 case which overruled *Geer* on Commerce Clause grounds,[142] the nineteenth-century jurists he derided had based their analysis on 1300 years of precedent.[143] Moreover, an analysis of twentieth-century cases found that Roman law continues to play a vital role in contemporary American jurisprudence.[144] For example, in *Borough of Neptune*, Justice Hall referenced ancient Roman law in his majority opinion.[145] American courts have continued to cite the Institutes of Justinian and to discuss the public trust doctrine and the nature of public ownership of public trust resources even after *Hughes v. Oklahoma.* In *Caminiti v. Boyle*, for example, Justice Andersen traced the history of the public trust doctrine back to the Institutes of Justinian and built his distinction between the two aspects of state ownership, *jus privatum and jus publicum*, upon the ancient Roman law categorizations of things that are common to all and things capable of private ownership.[146] In *National Audubon Society*, Chief Justice Broussard began his analysis with Justinian.[147] In *Matthews*, Justice Schreiber cited the Institutes of Justinian and connected the ancient Roman law to *Arnold*.[148] In *Glass*, Justice Corrigan began her analysis of the public trust doctrine with Justinian.[149] These nineteenth-, twentieth-, and twenty-first-century cases all proceed under the assumption that this oft-quoted section of the Institutes of Justinian is still good law, honored in American courts some 1500 years later, despite Justice Brennan's statement in *Hughes*.

The continued relevance, legitimacy, and precedential power of the Institutes of Justinian indicate that the doctrine is still binding.[150] In the cases discussed above, each court quotes Justinian in full[151]: "By the law of nature these things are common

142 *See id.*

143 Geer v. Connecticut, 161 U.S. 519, 521–28 (1896).

144 *See* Astorino, *supra* note 139 and accompanying test.

145 *See generally* Borough of Neptune City v. Borough of Avon-by-the-Sea, 294 A.3d 47 (N.J. 1972).

146 *See* Caminiti v. Boyle, 732 P.2d 989, 994 (Wash. 1987).

147 *See* Nat'l Audubon Soc'y v. Superior Ct., 658 P.2d 709, 718 (Cal. 1983).

148 Matthews v. Bay Head Improvement Ass'n, 471 A.2d 355, 360 (N.J. 1984).

149 Glass v. Goeckel, 703 N.W.2d 58, 63–64 (Mich. 2005).

150 *See* Astorino, *supra* note 139, at 652–54.

151 *See Caminiti*, 732 P.2d at 994–95 (Wash. 1987); Borough of Neptune City v. Borough of Avon-by-the-Sea, 294 A.3d 47 (N.J. 1972); *Nat'l Audubon Soc'y*, 658 P.2d at 718; *Matthews*, 471 A.2d at 360; *Glass*, 703 N.W.2d at 64.

to all men; air, running water, the sea, and consequently the shores of the sea."[152] While the public trust doctrine may have developed largely in the context of water resources, there is no reason to believe that it is therefore *limited* to water resources. Just as longstanding principles of statutory interpretation hold that courts must give effect, if possible, to every clause and word of a statute, court decisions relying on a particular word or phrase in the Institutes of Justinian should not be taken as an invalidation of the rest of the sentence.[153] If a single sentence from the Institutes of Justinian has been repeatedly relied upon by American courts throughout our country's history, every word of that sentence should be given effect if possible. Although the court in *Robinson Township* does not explicitly refer to the Institutes of Justinian, the court appears to have done just that by including air within the public trust doctrine.[154] The roots of the public trust doctrine are too deep, and too widely relied upon by American courts, to suppose that the word "air" holds no force.

B. *Air's Effect on Navigable Waters Justifies Its Inclusion in the Public Trust Doctrine*

> "By the law of nature these things are common to all men; air, running water, the sea, and consequently the shores of the sea."[155]

As scientific knowledge about the connection between water and related resources improves, the words of the Institutes of Justinian have provided additional support to the idea of expanding the public trust doctrine to non-water resources.[156] The phrase "*consequently* the shores of the sea" indicates that resources

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152 INSTITUTES OF JUSTINIAN, *supra* note 20, at 78.

153 *Cf.* Williams v. Taylor, 529 U.S. 362, 404 (2000) ("It is, however, a cardinal principle of statutory construction that we must 'give effect, if possible, to every clause and word of a statute.'"). Similarly, if a single sentence from the Institutes of Justinian has been relied on repeatedly by American courts throughout American history in order to define one of the fundamental doctrines of environmental law, courts should give effect, if possible, to every word of that sentence.

154 Robinson Twp. v. Commonwealth, 83 A.3d 901, 955 (Pa. 2013).

155 INSTITUTES OF JUSTINIAN, *supra* note 20, at 78.

156 *See, e.g.*, Just v. Marinette Cty., 201 N.W.2d 761, 765–68 (Wis. 1972); *see* Matthews v. Bay Head Improvement Ass'n, 471 A.2d 355, 360 (N.J. 1984); Glass v. Goeckel, 703 N.W.2d 58, 64 (Mich. 2005); *In re* Water Use Permit Applications, 9 P.3d 409, 425 (Haw. 2000); INSTITUTES OF JUSTINIAN, *supra* note 20, at 78.

adjacent to the sea may be added to the public trust in order to ensure the sea's protection, and to safeguard the public's access to the seashore.[157] This phrase suggests that resources connected to aquatic resources may be added to the public trust doctrine for the same reason.

Just as access to the seashore is essential to preserving the public right of access to the sea, so is preserving non-navigable tributaries and wetlands necessary to protect the right of fishing and navigation in public trust waters. As evidenced by the cases discussed throughout this Article, courts have found that a great many resources must be protected as a consequence of the sovereign obligation to protect traditional trust resources.[158]

American courts have expanded the limits of the public trust doctrine horizontally to beaches and land adjacent to water, with the understanding that tributaries flow into mighty rivers and oceans, that wetlands protect the purity of those navigable waters, and that the public cannot meaningfully access those waters without crossing over dry sand beaches.[159] For example, in *Just*, discussed *supra*, the Supreme Court of Wisconsin upheld a state law restricting shoreline development for the purpose of "[aiding] in the fulfillment of the state's role as trustee of its navigable waters"[160] on the grounds that "[w]hat makes this case different from most condemnation or police power zoning cases is the interrelationship of the wetlands, the swamps and the natural environment of shorelands to the purity of the water and to such natural resources as navigation, fishing, and scenic beauty."[161] The treatment of dry sand beaches, as in *Matthew*, followed a similarly horizontal logic: without access to dry sand beaches, there is no

157 INSTITUTES OF JUSTINIAN, *supra* note 20, at 78. *See also Matthews*, 471 A.2d at 360 (emphasis added).

158 *See, e.g.*, Geer v. Connecticut, 161 U.S. 519 (1896) (wildlife).; Caminiti v. Boyle, 732 P.2d 989, 994 (Wash. 1987) (citing Wilbour v. Gallagher, 462 P.2d 232 (Wash. 1969)); *see also* Borough of Neptune City v. Borough of Avon-by-the-Sea, 294 A.3d 47, 54 (N.J. 1972); *Matthews*, 471 A.2d 355 (dry sand beaches); *Just*, 201 N.W.2d 761 (wetlands); Nat'l Audubon Soc'y v. Superior Ct., 658 P.2d 709 (Cal. 1983) (tributaries); In re *Water Use Permit Applications*, 9 P.3d 409 (groundwater); *Robinson Twp.*, 83 A.3d at 955 (air).

159 *See, e.g.*, *Just*, 201 N.W.2d 761.

160 *Id.* at 765 (holding that wetlands are a public trust resource).

161 *Id.* at 767–68.

access to navigable waters;[162] so, too, the shores of the Great Lakes below the ordinary high-water mark, as in *Glass*.[163]

American courts have also expanded the limits of the public trust doctrine vertically beneath navigable water to include groundwater resources, with the understanding that groundwater and surface water are inextricably connected, and that the quality and quantity of the former will affect the latter. In *In re Water Use Permit Applications*, the Supreme Court of Hawaii found that, "[b]oth categories represent no more than a single integrated source of water with each element dependent upon the other for its existence. . . . Modern science and technology have discredited the surface-ground dichotomy."[164]

The limits of the public trust doctrine have crept ever outward as modern science reveals the connections between water and its surrounding land and wildlife. This is a function of the expansive and flexible nature of the common law in general,[165] and the public trust doctrine in particular, which has adapted to new knowledge and needs.[166] This expansion is also deeply rooted in the very origins of the public trust doctrine, where ancient Roman law has, from the beginning, declared, "[b]y the law of nature these things are common to all men; the air, running water, the sea, and *consequently* the shores of the sea."[167]

By the same logic, air might be included in the public trust doctrine *as a consequence* of its impact on navigable waters. Where there is a physical, chemical or biological connection—"a significant nexus," to borrow Justice Kennedy's phrase in *Rapanos*[168]—between seas, tidal waters, or navigable waters and

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162 *See* Matthews v. Bay Head Improvement Ass'n, 471 A.2d 35 (N.J. 1984).

163 *See* Glass v. Goeckel, 703 N.W.2d 58, 62 (Mich. 2005).

164 *See In re* Water Use Permit Applications, 9 P.3d 409, 447 (Haw. 2000) (internal citations omitted).

165 *See* Andrew P. Morriss, *Codification and Right Answers*, 74 CHI.-KENT L. REV. 355, 376 (1999) (discussing the perspective that the common law is "elastic and flexible and so could adapt itself to new circumstances while statutes could not change without legislative action").

166 *See* Borough of Neptune City v. Borough of Avon-By-The-Sea, 294 A.2d 47, 54 (N.J. 1972).

167 *See* INSTITUTES OF JUSTINIAN, *supra* note 20, at 78 (emphasis added).

168 *Cf.* Raponos v. United States, 547 U.S. 715, 767 (2006) (stating that, where the connection between a non-navigable water or wetland and a navigable water may be so close, or potentially so close, that the water or wetland may be a "navigable water" under the Clean Water Act, but that, "absent a significant nexus, jurisdiction under the Act is lacking.").

another resource, that resource may be encompassed within the public trust. There is no reason that the boundaries of the public trust doctrine may not be extended upward, just as they have been extended outward and downward. Where there is a significant nexus between air and water quality, as for example in the presence of increased carbon dioxide (CO_2) dissolved in the territorial seas,[169] the public trust doctrine may be fairly extended to regulating the atmosphere as an aid to meeting the government's public trust responsibilities vis-à-vis the water.[170] Such an extension would be in line with prior decisions about wetlands and groundwater, as well as the original language of the Institutes of Justinian, which declared that the air is common to mankind.

Modern science clearly indicates that the composition of the atmosphere affects the quality of the water.[171] Higher atmospheric CO_2 levels warm, acidify, and lower the oxygen levels of navigable waters.[172] Warmer, more acidic, and comparatively deoxygenated waters affect the entire life cycle of fish, shellfish, and other aquatic life.[173] This in turn threatens one of the most traditional rights protected under the public trust doctrine: the right to fish.[174]

C. *Air's Effect on Wildlife Supports Inclusion of Air in the Public Trust*

Air might also be included in the public trust as a consequence of its effects on wildlife, which has been recognized

169 *See* Elizabeth Kolbert, *The Acid Sea*, NAT'L GEOGRAPHIC (Apr. 2011), https://www.nationalgeographic.com/magazine/2011/04/ocean-acidification/.

170 *See* Juliana v. United States, 217 F. Supp. 3d 1224 (D. Or. 2016) (citing Foster v. Wash. Dep't of Ecology, No. 14-2-25295-1 (Wash. Super. Ct. 2015)).

171 *See, e.g.*, *Carbon Cycle*, NASA, https://science.nasa.gov/earth-science/oceanography/ocean-earth-system/ocean-carbon-cycle (last visited Nov. 6, 2018) [hereinafter NASA, *Carbon Cycle*]; *Carbon Cycle*, NOAA, https://www.noaa.gov/resource-collections/carbon-cycle (last visited Nov. 6, 2018) [hereinafter NOAA, *Carbon Cycle*]; NOAA, *Ocean Acidification*, *supra* note 1.

172 *See id.*

173 *See* Biello, *supra* note 1.

174 *See id; see also* NOAA, *Ocean Acidification*, *supra* note 1; *see, e.g.*, Borough of Neptune City v. Borough of Avon-By-The-Sea, 294 A.2d 47, 54 (N.J. 1972) (referring to the "ancient prerogatives of navigation and fishing"); Shively v. Bowlby, 152 U.S. 1, 11–13 (1894) (lengthy discussion of the public right to fish in English common law).

as a public trust resource in this country since *Geer*.[175] Although the U.S. Supreme Court overturned *Geer* in *Hughes*, it did not reject the idea that the public has an important interest in resources such as wildlife, nor did it reject the idea that the state has the right and responsibility to protect the public's interest.[176] Following *Hughes*, American courts have recognized wildlife as part of the public trust. While the ownership theory of *Geer* has been weakened, the public trust doctrine as applied to wildlife has survived in the form of a "trusteeship" theory,[177] the police power,[178] and state statutes[179] and constitutions[180] codifying the public trust.

The public trust doctrine could reasonably be invoked to stop the extermination of entire species. Although the Endangered Species Act has prohibited the taking of endangered and

175 *See* Geer v. Connecticut, 161 U.S. 519 (1896).

176 *See* Hughes v. Oklahoma, 441 U.S. 322, 335–36 (1979).

177 *See, e.g.*, Clajon Prod. Corp. v. Petera, 854 F. Supp. 843, 848 (D. Wyo. 1994) (upholding the constitutionality of a Wyoming statute declaring wildlife to be the property of the state by distinguishing between a claim of ownership in a proprietary sense and a "claim of ownership by the state in its sovereign capacity for the common benefit and interest of all of its citizens"); *see also* Mountain States Legal Found. v. Hodel, 799 F.2d 1423, 1426 (10th Cir. 1986) (alluding to the state's role as trustee). The court in *Mountain States Legal Foundation* stated that:

> It is well settled that wild animals are not the private property of those whose land they occupy, but are instead a sort of common property whose control and regulation are to be exercised "as a trust for the benefit of the people." The governmental trust responsibility for is lodging initially in the states, but only in so far as its exercise may not be incompatible with, or restrained by, the rights conveyed to the Federal government by the Constitution. Neither state nor federal authority over wildlife is premised upon any technical "ownership" of wildlife by the government.

Mountain States Legal Found., 799 F.2d at 1426 (citations omitted).

178 *See, e.g.*, *Mountain States Legal Foundation*, 799 F.2d at 1426 (alluding to the ability to protect wildlife through the police power); Ridenour v. Furness, 504 N.E.2d 336, 339 n.3 (Ind. Ct. App. 1987) (locating public trust doctrine in the state's police power).

179 *See, e.g.*, *Ridenour*, 504 N.E.2d at 339–340 (reaffirming "ownership theory" based on Indiana statute).

180 *See, e.g.*, Cal. Trout, Inc. v. State Water Res. Control Bd., 255 Cal. Rptr. 184, 212 (Cal. Ct. App. 1989) (citing the California constitution and *Geer*); Owsichek v. State Guide Licensing and Control Bd., 763 P.2d 488, 494–95 & n.12 (Alaska 1988) (describing the codification of *Geer* in Alaska's constitution).

threatened species and protected critical habitat,[181] it is designed to protect individual species and their habitats[182] rather than addressing a globalized problem like climate change. Climate change has accelerated rates of extinction by increasing temperatures, altering precipitation patterns, and destabilizing habitats.[183] A recent study compared modern rates of vertebrate species extinction with the background extinction rate for mammals, using conservative assumptions in an attempt to find a "lower bound" on humanity's impact on biodiversity.[184] The study found that "current extinction rates vastly exceed natural average background rates."[185] Modern extinction rates for vertebrates ranged from eight to one hundred times higher than the background rate.[186] Scientists have described this phenomenon as a Sixth Great Extinction.[187]

The Center for Biological Diversity, citing research from the International Union for Conservation of Nature (IUCN), estimates that 38 percent of the species evaluated by the IUCN are at risk of extinction.[188] A recent study of population sizes and ranges indicates that threats to wildlife and biodiversity are more severe than studies focused exclusively on species extinctions would suggest.[189] Furthermore, climate change has compounded the stresses of poaching, habitat destruction and fragmentation, and

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181 Endangered Species Act, 16 U.S.C. § 1538 (2019) (prohibited acts), 16 U.S.C. § 1533 (2019) (designating endangered and threatened species and critical habitat for endangered and threatened species).

182 *See id.*

183 *See* WORLD WILDLIFE FUND, WILDLIFE IN A WARMING WORLD: THE EFFECTS OF CLIMATE CHANGE ON BIODIVERSITY IN WWF'S PRIORITY PLACES 4-5 (2018), https://www.worldwildlife.org/publications/wildlife-in-a-warming-world-the-effects-of-climate-change-on-biodiversity.

184 *See* Gerardo Ceballos et al., *Accelerated Modern Human-Induced Species Losses: Entering the Sixth Mass Extinction*, 1 SCI. ADVANCES 5 (2015), http://advances.sciencemag.org/content/1/5/e1400253.

185 *Id.*

186 *See id.*

187 *See id.*

188 *See The Extinction Crisis*, CTR. FOR BIOLOGICAL DIVERSITY, http://www.biologicaldiversity.org/programs/biodiversity/elements_of_biodiversity/extinction_crisis/ (last visited Jan. 19, 2019).

189 *See* Gerardo Ceballos et al., *Biological Annihilation via the Ongoing Sixth Mass Extinction Signaled by Vertebrate Population Losses and Declines*, PROCEEDINGS OF THE NAT'L ACA. OF SCI. (2017), http://www.pnas.org/content/early/2017/07/05/1704949114.full.

other human activities.[190] This implicates the public trust doctrine, as it deprives people of the sustenance, recreational, and conservation values of wildlife.

Climate change has wrought special devastation on aquatic life. Warming atmospheres mean warming seas, and higher levels of atmospheric CO_2 leads to higher levels of CO_2 dissolved into oceans, leading to acidification.[191] If dissolved CO_2 levels are too high and thus oceans are too acidic, fish do not feed, migrate, or spawn normally.[192] Similarly, if the water is too acidic, bivalves do not form their shells normally.[193] Globally, 21 percent of all fish species evaluated by the IUCN were deemed at risk of extinction.[194]

This implicates the right to fish and collect shellfish, one of the oldest and most traditional of the public trust uses.[195] From the banned fish weirs of the Magna Carta to infamous oyster beds of *Arnold*, the public right to catch fish and harvest oysters, subject to the reasonable limitations of the state's use of the police power to protect and preserve the resource, has long been a concern of the courts on both sides of the Atlantic.[196] This portion of the public trust cannot be protected without halting the warming, deoxygenation, and acidification of navigable waters and territorial seas. As a consequence, atmospheric CO_2 must be controlled via the public trust doctrine in order to protect the traditional public trust use of fishing and shellfish harvesting.

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190 *See* CTR. FOR BIOLOGICAL DIVERSITY, *supra* note 188.

191 *See, e.g.*, NASA, *Carbon Cycle*, *supra* note 171; NOAA, *Ocean Acidification*, *supra* note 1.; NOAA, *Carbon Cycle*, *supra* note 171; Kolbert, *supra* note 169.

192 *See* Biello, *supra* note 1.

193 *See* NOAA, *Ocean Acidification*, *supra* note 1.

194 *See* CTR. FOR BIOLOGICAL DIVERSITY, *supra* note 188.

195 *See, e.g.*, Borough of Neptune City v. Borough of Avon-By-The-Sea, 294 A.2d 47, 54 (N.J. 1972) (referring to the "ancient prerogatives" of fishing and navigation); Ill. Cent. R.R. Co. v. Illinois, 146 U.S. 387, 452 (referring to liberty of fishing); Joseph L. Sax, *The Public Trust Doctrine in Natural Resources Law: Effective Judicial Intervention*, 68 MICH. L. REV. 471, 475 (1970).

196 For English sources regarding to right to fish, see, e.g., FORDHAM UNIVERSITY: INTERNET HISTORY SOURCEBOOKS PROJECT, *supra* note 25; THE LISLE LETTERS: AN ABRIDGEMENT, *supra* note 26 at 140; Free Fishers of Whitstable v. Gann (1865), 11 Eng. Rep 1305 HL [1, 9–10]. For American sources, see, e.g., Arnold v. Mundy 6 N.J.L. 1 (1821) and Carson v. Blazer, 2 Binn. 475 (Pa. 1810).

D. *American Case Law on Air Suggests Inclusion in Public Trust Doctrine*

Although the common law doctrine of the public trust has largely developed in the context of water, some twentieth- and twenty-first-century U.S. cases treat air as a shared public resource, which could be applied in the public trust doctrine context. In *State of Georgia v. Tennessee Copper Co.*, Georgia sued a private company in Tennessee for discharging noxious gases into the air, which damaged forests, orchards, crops, and air quality in Georgia.[197] In a 1907 opinion, Justice Holmes stated that "[t]his is a suit by a state for an injury to it in its capacity of quasi-sovereign. In that capacity the state has an interest *independent of and behind the titles of its citizens*, in all the earth and air within its domain."[198] This indicates that the state has a public trust interest in the air.

In *United States v. Causby*, a private landowner brought suit against the United States, alleging that flights from a nearby airport constituted a taking.[199] In its discussion of the merits of the case, the Court stated:

> The air is a public highway, as Congress has declared. Were that not true, every transcontinental flight would subject the operator to countless trespass suits. . . . To recognize such private claims to the airspace would clog these highways, seriously interfere with their control and development in the public interest, and transfer into private ownership that to which only the public has a just claim.[200]

Although the Court situated the source of the public's right to the air in the Air Commerce Act of 1926,[201] its description of the airspace as something "to which only the public has a just claim"[202] indicates that the air is an inherently public resource, which is consistent with the concept of an atmospheric public trust doctrine. Moreover, its acceptance of the federal government's

197 *See* Georgia. v. Tenn. Copper Co., 206 U.S. 230 (1907).
198 *Id.* at 237 (emphasis added).
199 *See* United States v. Causby, 328 U.S. 256 (1946).
200 *Id.* at 261.
200 *See id*. at 260.
201 *See id.* at 261.
202 *Id.*

right to control navigation within that airspace suggests that the *federal* government holds this resource in trust for the public, supporting the possibility of a federal atmospheric trust doctrine.

In *United States v. Helsley*, the Ninth Circuit considered the constitutionality of the Airborne Hunting Act of 1971, a federal law which prohibited shooting wildlife from an aircraft without a license or permit to do so.[203] The Ninth Circuit found that the Act was properly grounded in the commerce clause of the U.S. Constitution.[204] The court also declared that "[w]e think the federal power to regulate the air space is as complete and as valid as the federal power, to the extent it rests upon the commerce clause, to regulate navigable waters."[205] While the court's analysis is grounded in the commerce clause rather than the public trust doctrine, it reaffirms the sovereign power of the federal government to regulate the air space.

These three cases are followed by *Robinson*, a twenty-first-century case that directly addressed the question of whether the public trust includes air.[206] Chief Justice Castille of the Pennsylvania Supreme Court held that it did, on the grounds that air quality implicates the public interest and is outside the scope of purely private property.[207] According to the Pennsylvania Supreme Court, public natural resources include "resources that implicate the public interest, such as ambient air, surface and ground water, wild flora, and fauna (including fish) that are outside the scope of purely private property."[208] These cases suggest that air may be included within the public trust.

E. *Air is a Public Trust Resource*

Taken together, the origin and development of the public trust doctrine, the emergence of scientific connections between atmosphere and navigable water, and contemporary social norms about the value of environmental preservation support the inclusion of air as a public trust resource. The Institutes of Justinian proclaims that, by the law of nature, the air is common to

203 *See* United States v. Helsley, 615 F.2d 784, 786 (9th Cir. 1979).
204 *See id.*
205 *See id.*
206 *See* Robinson Twp. v. Commonwealth, 83 A.3d 901, 955 (Pa. 2013).
207 *See id.*
208 *See id.*

mankind.[209] American courts have quoted the Institutes of Justinian for centuries, with nary a suggestion that "air" was somehow excluded from the public trust, despite being included in Justinian.[210] The fact that the courts have primarily focused on water resources in public trust doctrine cases may be explained by the greater number of cases adjudicated over oyster beds, fish weirs, and obstacles to navigation as compared to air.[211]

III. THE FEDERAL PUBLIC TRUST DOCTRINE'S EXISTENCE IS EVIDENT IN THE TREATMENT OF U.S. TERRITORIES, TERRITORIAL SEAS, EMINENT DOMAIN

A. *The Public Trust Doctrine in the United States: A Creature of State Law?*

The public trust doctrine has been largely developed in the context of state law, due to the unique history of territorial expansion in this country. At the founding of the country, each of the thirteen original states retained control over their navigable waters and the streambeds beneath them, subject to the federal navigation servitude.[212] As new states joined the Union, they retained control over their navigable waters and streambeds,

209 *See* INSTITUTES OF JUSTINIAN, *supra* note 20, at 78

210 *See, e.g.*, Geer v. Connecticut, 161 U.S. 519, 522–28 (1896); Arnold v. Mundy, 6 N.J.L. 1, 11–13 (1821); Astorino, *supra* note 139 and accompanying text; Caminiti v. Boyle, 732 P.2d 989, 994–95 (Wash. 1987); Borough of Neptune City v. Borough of Avon-By-The-Sea, 294 A.2d 47 (N.J.1972); Nat'l Audubon Soc'y v. Superior Ct., 658 P.2d 709, 718 (Cal. 1983); Matthews v. Bay Head Improvement Ass'n, 471 A.2d 355, 360 (N.J. 1984); Glass v. Goeckel, 703 N.W.2d 58, 64 (Mich. 2005). Had these courts wished to clarify that the Institutes of Justinian was only germane insofar as the resource at hand was concerned (i.e., only wildlife for *Geer*, only oysters and navigable waters for *Arnold*, etc.), they could have done so. Instead, they reaffirmed the continued relevance of the Institutes of Justinian in the context of 19th and 20th century American common law, and suggested with each citation to that passage of the Institute of Justinian, that every resource listed could be read as a public trust doctrine resource.

211 A Westlaw search performed in 2017 of "air" and "public trust" cases prior to 1975 yielded 187 cases. In contrast, a Westlaw search of "water" and "public trust" cases prior to 1975 yielded 1063 cases, a Westlaw search of "oyster" and "public trust" prior to 1975 yielded 66 cases, a Westlaw search of "fish" and "public trust" prior to 1975 yielded 222 cases, and a Westlaw search of "navigation" and "public trust" prior to 1975 yielded 435 cases.

212 *See* Idaho v. Coeur d'Alene Tribe of Idaho, 521 U.S. 261, 283–84 (1997).

subject to the navigation servitude,[213] under the "equal footing doctrine."[214] Each state was and is a sovereign power, with concomitant rights and responsibilities over their public trust resources.[215]

As Justice Kennedy wrote in a landmark Supreme Court opinion, *Idaho v. Coeur d'Alene Tribe of Idaho*:

> [L]ands underlying navigable waters have historically been considered "sovereign lands." State ownership of them has been considered an essential attribute of sovereignty. The Court from an early date has acknowledged that the people of each of the Thirteen Colonies at the time of independence became themselves sovereign; and in that character hold the absolute right to all their navigable waters and the soils under them for their own common use, subject only to the rights since surrendered by the Constitution to the general government. Then [in 1845] . . . the Court concluded that States entering the Union after 1789 did so on an equal footing with the original States and so have similar ownership over these sovereign lands. In consequence of this rule, a State's title to these sovereign lands arises from the equal footing doctrine and is conferred not by Congress but by the Constitution itself. The importance of these lands to state sovereignty explains our longstanding commitment to the principle that the United States is presumed to have held navigable waters in acquired territory for the ultimate benefit of future States and that disposals by the United States during the territorial period are not lightly to be inferred, and should not be regarded as intended unless the intention was definitely declared or otherwise made very plain.[216]

Each sovereign state has developed its own public trust doctrine with respect to its navigable waters and submerged lands. The

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213 Glass v. Goeckel, 703 N.W.2d 58, 64 n.7 (Mich. 2005) ("[W]e note that the Great Lakes and the lands beneath them remain subject to the federal navigational servitude. . . . Although the title to the shore and submerged soils is in the various States and individual owners under them, it is always subject to the servitude in respect of navigation created in favor of the Federal government by the Constitution.").

214 *See Coeur d'Alene*, 521 U.S. at 283–284.

215 *See id.* at 283.

216 *Id.* at 283–84 (internal quotations and citations omitted).

doctrine has largely been developed through the courts,[217] sometimes in dialogue with the state legislature[218] or the state constitution.[219] The role of state law is so prominent in the development of the public trust doctrine that Justice Kennedy wrote:

> [T]he public trust doctrine remains a matter of state law . . . subject as well to the federal power to regulate vessels and navigation under the Commerce Clause and admiralty power. While equal-footing cases have noted that the State takes title to the navigable waters and their beds in trust for the public, the contours of that public trust do not depend upon the Constitution. Under accepted principles of federalism, the States retain residual power to determine the scope of the public trust over waters within their borders, while federal law determines riverbed title under the equal-footing doctrine.[220]

It would be easy to conclude from these opinions that the public trust doctrine in the United States is a matter of state law, and to extrapolate further that there is no federal public trust doctrine. Indeed, some courts have drawn this very conclusion.[221] For example, in 2012, the U.S. District Court of the District of Columbia dismissed an atmospheric public trust case brought by a group of young plaintiffs on the grounds that the public trust doctrine is a creature of state common law and not federal law.[222] The D.C. Circuit affirmed, explaining that the Supreme Court in *PPL Montana* "repeatedly referred to 'the' public trust doctrine and directly and categorically rejected any federal constitutional

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217 *See* cases cited *supra* note 136.

218 *See, e.g.*, Just v. Marinette Cty., 201 N.W.2d 761, 765 (Wis. 1972) (referencing Wisconsin's Navigable Waters Protection Act, the purpose of which was to "aid in the fulfillment of the state's role as trustee of its navigable waters. . . .").

219 *See, e.g.*,); Robinson Twp. v. Commonwealth, 83 A.3d 901, 954–59 (Pa. 2013) (discussing the Environmental Rights Amendment to the Pennsylvania state constitution, which codified the public trust doctrine).

220 PPL Montana, LLC v. Montana, 565 U.S. 576, 603–04, (2012) (internal citations omitted).

221 *See* Alec L. v. Jackson, 863 F. Supp. 2d 11, 15–17 (D.D.C. 2012); Alec L. ex rel. Loorz v. McCarthy, 561 Fed. Appx. 7 (D.C. Cir. 2014).

222 *Jackson*, 863 F. Supp. 2d at 15–17 (D.D.C. 2012).

foundation for that doctrine without qualification or reservation."[223]

However, as discussed in the following sections, the federal government holds public trust resources in the form of territories,[224] territorial seas,[225] and navigable waters taken by eminent domain.[226] The federal government holds these resources in trust for the benefit of the people, and in the case of U.S. territories, for the benefit of future states.[227]

B. *The Federal Public Trust Doctrine is Evident in the Context of U.S. Territories*

The federal government has managed public trust resources since its inception. After the formation of the Union with its thirteen original colonies, the federal government acquired territory farther west.[228] As each territory attained statehood, the new sovereign state gained title to navigable water and submerged lands within the state's boundaries pursuant to the equal footing doctrine.[229] The states did not gain title in fee simple, but gained it subject to the public trust doctrine, as state and federal courts have held throughout our country's history.[230]

The state public trust doctrine did not emerge *sua sponte* as new territories attained statehood.[231] Rather, the federal

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223 *McCarthy*, 561 Fed. Appx. 7.

224 *See* Shively v. Bowlby, 152 U.S. 1, 57 (1894) ("Upon the acquisition of a territory by the United States . . . the same title and dominion passed to the United States, for the benefit of the whole people, and in trust for the several states to be ultimately created out of the territory.").

225 *See* United States v. California, 332 U.S. 19, 40 (1947).

226 *See* United States v. 1.58 Acres of Land Situated in City of Boston, 523 F. Supp. 120 (D. Mass. 1981); City of Alameda v. Todd Shipyards Corp., 635 F. Supp. 1447, 1449 (N.D. Cal. 1986).

227 *See Shively*, 152 U.S. at 57 (1894); *California*, 332 U.S. at 40; *1.58 Acres of Land*, 523 F. Supp. 120; *City of Alameda*, 635 F. Supp. at 1449.

228 Samuel Shipley, *List of U.S. States' Dates of Admission to the Union*, ENCYC. BRITANNICA (Aug. 15, 2018), https://www.britannica.com/topic/list-of-U-S-states-by-date-of-admission-to-the-Union-2130026.

229 *See* PPL Montana, LLC v. Montana, 565 U.S. 576, 604 (2012).

230 *See id.* at 591, 603–04.

231 *See Shively*, 152 U.S. at 57 (1894); *see* also Arnold v. Mundy 6 N.J.L. 1, 1–2 (N.J. 1821) ("Navigable rivers. . . are common to all the people of New Jersey. By the grant of Charles II to the duke of York, those royalties, of which the rivers, ports, bays, and coasts were a part, passed to the duke of York, as the governor of the province exercising the royal authority, and not as the proprietor of the soil, and for his own use. Upon the Revolution, all those royal rights

government held these public resources in trust for the people prior to transferring the trust to the newly formed states.[232] In *Shively v. Bowlby*, the Supreme Court considered whether the federal government had transferred title to lands beneath the Columbia River to homesteaders in Oregon prior to statehood.[233] The Court held that no such transfer had occurred, explaining that upon acquisition of a territory by the United States, the title and dominion in lands under tidal or navigable waters passed to the United States "for the benefit of the whole people and in trust for the several states to be ultimately created out of the territory."[234]

The federal government still holds territories, including Puerto Rico,[235] Guam, the U.S. Virgin Islands, the Mariana Islands, and American Samoa.[236] Under the logic of *Shively*, the federal government holds public resources in these territories in trust.[237] Unless and until these territories attain statehood, the federal government holds the title and dominion of tide waters and submerged lands for the benefit of the U.S. people and "in trust for the future states."[238]

To the extent that atmospheric concentrations of greenhouse gases harm public trust resources in U.S. territories, the federal government has an obligation under the public trust doctrine to abate threats to these resources.[239] To do otherwise would constitute a failure to hold these resources for the benefit of the people and in trust for future states that may emerge from present-day U.S. territories. For example, the territories of Puerto Rico and the U.S. Virgin Islands have suffered grave damages to their surface water as a result of Hurricane Maria,[240] one of several

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vested in the people of New Jersey, as the sovereign of the country, and are now in their hands.").

232 *See Shively*, 152 U.S. at 57.

233 *See id.* at 9.

234 *Id.* at 57.

235 *See* Rachel Lewis, *Is Puerto Rico Part of the U.S.? Here's What to Know*, TIME (Sept 26, 2017), http://time.com/4957011/is-puerto-rico-part-of-us/.

236 *See* OFFICE OF INSULAR AFFAIRS, DEP'T OF THE INTERIOR, https://www.doi.gov/oia (last visited Nov. 6, 2018).

237 *See* Shively v. Bowlby, 152 U.S. 1, 57 (1894).

238 *Id.* at 49 (internal citation omitted).

239 *See id.*

240 *See* Press Release, EPA, EPA Hurricane Maria Update for Wednesday, Oct. 11th (Oct. 11, 2017), https://www.epa.gov/newsreleases/epa-hurricane-maria-update-wednesday-october-11th ("There are reports of residents obtaining, or trying to obtain, drinking water from wells at hazardous waste 'Superfund'

unusually intense and damaging storms of the record-breaking 2017 hurricane season fueled by warmer air and ocean surface temperatures.[241] In addition to causing nearly three thousand deaths[242] and knocking out basic infrastructure including power and running water, the hurricane also flooded a number of contaminated sites in Puerto Rico, polluting its navigable waters, wetlands, and estuaries; and depriving much of the population of clean drinking water and fishable water bodies.[243]

While climate scientists cannot conclusively attribute Maria's damage to climate change, there is a clear connection between increased atmospheric concentrations of greenhouse gases and warming air and ocean surface temperatures, which are in turn linked to higher wind speeds and greater precipitation in hurricanes.[244] Where there is a clear nexus[245] between public trust resources held by the federal government[246]—such as Puerto Rico's navigable waters and their tributaries and wetlands—and

sites in Puerto Rico. . . . Raw sewage continues to be released into waterways and is expected to continue until repairs can be made and power is restored. Water contaminated with livestock waste, human sewage, chemicals, and other contaminants can lead to illness when used for drinking, bathing, and other hygiene activities. According to the CDC, people should not use the water from rivers, streams, and coastal water to drink, bathe, wash, or to cook with unless first boiling this water for a minimum of one minute.").

241 *See* Annie Sneed, *Was the Extreme 2017 Hurricane Season Driven by Climate Change? Global Warming Already Appears to be Making Hurricanes More Intense*, SCI. AM. (Oct. 26, 2017), https://www.scientificamerican.com/article/was-the-extreme-2017-hurricane-season-driven-by-climate-change/; *also* Geert Jan van Oldenborgh *et al.*, *Attribution of Extreme Rainfall from Hurricane Harvey, August 2017*, 12 ENVTL. RES. LETTER 10 (2018), http://iopscience.iop.org/article/10.1088/1748-9326/aa9ef2/pdf.

242 *See* MILKEN INSTITUTE SCHOOL OF PUBLIC HEALTH, GEO. WASH. UNIV., ASCERTAINMENT OF THE ESTIMATE EXCESS MORTALITY FROM HURRICANE MARIA IN PUERTO RICO iii (2018), https://publichealth.gwu.edu/sites/default/files/downloads/projects/PRstudy/Acertainment%20of%20the%20Estimated%20Excess%20Mortality%20from%20Hurricane%20Maria%20in%20Puerto%20Rico.pdf.

243 *See* EPA, *supra* note 240.

244 *See* Sneed, *supra* note 241.

245 *See In re* Water Use Permit Applications, 9 P.3d 409, 447 (Haw. 2000) (finding that groundwater is protected by the public trust because of the connection between surface water quality and groundwater quality).

246 *See* Shively v. Bowlby, 152 U.S. 1, 57 (1894) ("Upon the acquisition of a territory by the United States . . . the same title and dominion passed to the United States, for the benefit of the whole people, and in trust for the several states to be ultimately created out of the territory.").

atmospheric concentrations of greenhouse gases,[247] it is logical to find that the atmosphere is within the scope of the federal public trust.

C. *The Federal Public Trust Doctrine is Evident in the Context of Territorial Seas*

The scope of the federal trust doctrine also encompasses the territorial seas, which extend twelve miles from the shore.[248] The federal government does not hold the territorial seas in fee simple; rather, the federal government holds them for the benefit of the people.[249] On the territorial seas, the federal public trust doctrine is not dormant, extinguished, or nonexistent, but is in full force and effect.[250]

In 1947, the U.S. Supreme Court considered whether the federal government owned or possessed paramount rights in and powers over the three-mile marginal ocean belt of the California Coast.[251] The United States had sued California, seeking a declaration that the United States was the owner in fee simple of, or possessed of paramount rights in and powers over, this submerged land, as well as an injunction against California's alleged trespassing on the submerged land.[252] The United States alleged, and California admitted, that the state had executed numerous petroleum, gas, and mineral deposits.[253]

California defended its actions by claiming ownership of the marginal belt.[254] California claimed that the belt lay within the original boundaries of the state, that the thirteen original states acquired ownership of their own three-mile marginal belts from the Crown of England, and that California was entitled to ownership of its own three-mile marginal belt under the equal

247 *See* Sneed, *supra* note 241; EPA, *supra* note 240 (discussing impact of the hurricane on surface water quality and navigable waters in Puerto Rico).

248 *See* Proclamation No. 5,928, 54 Fed. Reg. 777 (1989), *reprinted in* 103 Stat. 2,982, https://www.gpo.gov/fdsys/pkg/STATUTE-103/pdf/STATUTE-103-Pg2981.pdf ("The territorial sea of the United States henceforth extends to 12 nautical miles from the baselines of the United States determined in accordance with international law.").

249 *See* United States v. California, 332 U.S. 19, 40 (1947).

250 *See id.*

251 *See id.*at 22.

252 *See id.*at 22–23.

253 *See id.*at 23.

254 *See id.*

footing doctrine.[255] Writing for the Court, Justice Black found that the thirteen original colonies had not acquired ownership of the three-mile marginal belt, because "when this nation was formed, the idea of a three-mile belt over which a littoral nation could exercise rights of ownership was but a nebulous suggestion."[256] The concept of a three-mile marginal belt did not gain international acceptance until the late nineteenth century.[257] Therefore, the equal footing doctrine could not be used to support California's claims to the marginal belt.[258] Justice Black held that California was not the owner of the three-mile marginal belt, and that the federal government has paramount rights and powers in that belt.[259]

Justice Black also stated that the federal government "holds its interests, here as elsewhere, in trust for all the people."[260] Even "conceding that the state has been authorized to exercise local police power functions in the part of the marginal belt within its declared boundaries, these do not detract from the federal government's paramount rights in and power over this area."[261] Justice Black situates the paramount rights and powers of the federal government in relation to national external sovereignty and the "paramount responsibilities of the nation in war, peace and world commerce."[262] The federal government is not a mere property owner in this context; rather, it is a sovereign that holds its interests in trust for the people.[263]

It follows that the marginal belt (extending three miles away from the shore) and the territorial seas (extending to twelve miles away from the shore) are included within the public trust, with the federal government as trustee. This ownership endows the federal government with the right to make decisions concerning the seas and submerged lands within twelve miles of the vast U.S. coastline. It also gives the federal government the responsibility of managing this resource for the benefit of the people. To the extent that climate change affects the quality of the territorial seas, or

255 *See id.*
256 *Id.* at 32.
257 *See id.* at 33.
258 *See id.* at 19, 23, 31–35.
259 *See id.* at 40.
260 *Id.*
261 *Id.* at 36 (emphasis added).
262 *Id.* at 35.
263 *See id.* at 19, 40.

interferes with its security functions, the federal government is implicated in its role as trustee of the territorial seas and its submerged lands.

D. *The Federal Public Trust Doctrine is Evident in the Context of Eminent Domain*

There are also occasions when the federal government takes a portion of a state's navigable waters and submerged lands via eminent domain, thereby implicating its public trust doctrine responsibilities. For example, in *1.58 Acres of Land*, the Coast Guard moved to condemn 1.58 acres of waterfront property in Boston for use in a Coast Guard support center.[264] Massachusetts argued that the United States could not obtain fee simple in lands below the low-water mark.[265] The U.S. District Court for the District of Massachusetts held that the United States could take property below the low-water mark, but that it did so subject to the public trust doctrine.[266] As the court explained, the federal government takes the waters and submerged lands, not in fee simple, but in trust for the people.[267]

Similarly, in *City of Alameda*, the United States conveyed title to certain tidelands to a private corporation.[268] The U.S. District Court for the Northern District of California held that, if the land was subject to the action of tides when the United States acquired it by eminent domain, then the United States could not transfer it to a private party.[269]

When the federal government takes property that is subject to the public trust doctrine via eminent domain, that property is restored to the body of natural resources held in trust for the people

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264 *See* United States v. 1.58 Acres of Land Situated in City of Boston, 523 F. Supp. 120, 121 (D. Mass. 1981).

265 *See id.*

266 *See id.* at 124–125.

267 *See id*.

268 *See* City of Alameda v. Todd Shipyards Corp., 635 F. Supp. 1447 (N.D. Cal. 1986).

269 *See id.* at 1450 ("By condemnation, the United States acquired both the *jus privatum* (the bare ownership interest) and the *jus publicum* (the public trust interest). . . . By condemnation, the United States simply acquires the land subject to the public trust as though no party had held an interest in the land before.").

by the federal government.[270] Grants to the states may carve out a particular property or geographical territory from federal public trust resources, but it does not eliminate the ability of the federal government to hold resources in trust for the public.[271]

The federal government holds public trust resources in the form of territories, territorial seas, and navigable waters taken by eminent domain. The federal government must hold these resources in trust for the benefit of the people and, in the case of U.S. territories, for the benefit of future states.

E. *Judge Aiken Recognizes the Federal Public Trust Doctrine, Distinguishing* Juliana *from* PPL Montana *and* Coeur d'Alene

In *Juliana,* Judge Aiken, of the U.S. District Court for the District of Oregon, recognized the federal public trust doctrine in her order and opinion denying the government's motion to dismiss.[272] Plaintiffs in *Juliana* had sought declaratory and injunctive relief,[273] asking the court to order the federal government to prepare a consumption-based inventory of U.S. CO_2 emissions,[274] to prepare and implement an enforceable national remedial plan to phase out fossil fuel emissions and draw down excess atmospheric CO_2,[275] and to retain jurisdiction over this action in order to monitor and enforce the government's compliance with the national remedial plan and associated court orders.[276]

In particular, Plaintiffs sought a declaration that the federal government had violated the public trust doctrine and asked the court to enjoin the government from violating the doctrine.[277] Plaintiffs argued that the public trust doctrine is secured by the Ninth Amendment to the U.S. Constitution and embodied in the reserved powers doctrine of the Tenth Amendment and the

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270 *See* United States v. 1.58 Acres of Land Situated in City of Boston, 523 F. Supp. 120 (D. Mass. 1981); *City of Alameda*, 635 F. Supp. at 1449.

271 *See id.*

272 *See* Juliana v. United States, 217 F. Supp. 3d 1224 (D. Or. 2016).

273 *See* Juliana Complaint, *supra* note 8, at ¶¶ 1–9.

274 *See id*. at Prayer for Relief ¶ 6.

275 *See id*. at Prayer for Relief ¶ 7.

276 *See id.* at Prayer for Relief ¶ 8.

277 *See id*. at Prayer for Relief ¶ 5.

Vesting, Nobility, and Posterity Clauses of the Constitution.[278] Plaintiffs described the overarching public trust resource as "our country's life-sustaining climate system, which encompasses our atmosphere, waters, oceans, and biosphere."[279]

Plaintiffs asserted that the public trust doctrine applied to the federal government.[280] They argued that, "as sovereign trustees, Defendants have a duty to refrain from 'substantial impairment' of these essential natural resources."[281] In particular, Plaintiffs argued that the public trust doctrine required the federal government to "manage the atmosphere in the best interests of the present and future beneficiaries of the trust property," including the plaintiffs.[282] They also argued that the government's decisions regarding fossil fuel extraction and emissions have amounted to alienating substantial portions of the atmosphere in favor of private parties, compromising the sovereign powers of succeeding members of the Executive Branch and Congress to provide for the survival and welfare of our Nation's citizens and to promote the endurance of our Nation.[283]

The federal government sought to dismiss the case on the grounds that Plaintiffs lacked standing to bring the lawsuit,[284] that Plaintiffs failed to state a claim under the Constitution,[285] and that the federal court lacked jurisdiction over public trust doctrine suits, which arise under state law.[286] With respect to the public trust doctrine, the government argued that the Supreme Court and the Ninth Circuit have consistently treated the public trust doctrine as a matter of state law.[287] It also cited *Alec L. ex rel. Loortz v. McCarthy*[288] a D.C. Circuit court decision that upheld a motion to

278 *See id*. at ¶ 308.

279 *Id.*

280 *See id.* at ¶ 309 (discussing Congress and the Executive Branch).

281 *Id*. at ¶ 310.

282 *Id.*

283 *See id*.

284 *See* Federal Defendants' Memorandum of Points and Authorities in Support of Their Motion to Dismiss at 7–19, Juliana v. United States, 339 F. Supp. 3d 1062 (D. Or. Nov. 17, 2015) (No. 6:15-cv-01517-TC) [hereinafter Motion to Dismiss].

285 *See id*. at 19–27.

286 *See id*. at 27–29.

287 *See id*. at 28.

288 561 F. App'x 7 (D.C. Cir.) (per curiam), *cert. denied*, 135 S. Ct. 774 (2014).

dismiss in an atmospheric trust case, holding that the public trust doctrine is a matter of state law.[289]

Plaintiffs opposed the motion to dismiss, countering that their complaint stated claims upon which relief can be granted[290] and that they had standing to sue.[291] In particular, they argued that the public trust doctrine applied to the federal government, citing case law and secondary sources that support the application of the public trust doctrine to the federal government.[292] They argued that the government's reliance on *PPL Montana* and *McCarthy* was misplaced, because the D.C. Circuit misinterprets *PPL Montana* in *McCarthy*.[293] Moreover, they pointed to declarations of Congress and various federal agencies as further evidence that the federal government has recognized a federal public trust doctrine and has declared itself to be a trustee of natural resources.[294]

Judge Aiken's order and opinion affirmed the existence of a federal public trust doctrine.[295] She carefully distinguished *Juliana* from *PPL Montana*,[296] which the D.C. Circuit cited in *McCarthy* as justification for characterizing the public trust doctrine as solely a creature of state law.[297] First, Aiken found that *PPL Montana* did not foreclose the application of the public trust doctrine to assets held by the federal government.[298] The case dealt with navigable waters in the state of Montana.[299] Since the state held title to those waters and riverbeds, state law would govern the scope of Montana's obligations under the public trust.[300] Where the state holds title, it is the only possible trustee for purposes of the public

289 *See* Motion to Dismiss, *supra* note 284 at 28–29.

290 *See* Memorandum of Plaintiffs' in Opposition to Federal Defendants' Motion to Dismiss at 4-28, Juliana v. United States, 339 F. Supp. 3d 1062 (D. Or. Jan. 16, 2016) (No. 6:15-cv-01517-TC) [hereinafter Opposition to MTD].

291 *See id*. at 29–44.

292 *See id.* at 20–22.

293 *See* Opposition to MTD *supra* note 290, at 23–24.

294 *See id.* at 24–25.

295 *See* Juliana v. United States, 217 F. Supp. 3d 1224, 1259 (D. Or. 2016).

296 *See id.* at 1256–57.

297 *See* Alec L. v. Jackson, 863 F. Supp. 2d 11, 15 (D.D.C. 2012).

298 *See Juliana*, 217 F. Supp. 3d at 1256–57.

299 *See* PPL Montana, LLC v. Montana, 565 U.S. 576, 581 (2012) (describing rivers that flow through Montana and then beyond the state's borders and clarifying that the case concerns segments of those rivers within the borders of Montana).

300 *See Juliana*, 217 F. Supp. 3d at 1256–57.

trust doctrine.[301] By contrast, the plaintiffs in *Juliana* brought claims concerning the atmosphere and the territorial seas, in addition to navigable waters within the state.[302] While Aiken did not address the question of whether atmosphere is a public trust resource in her order and opinion,[303] she emphasized that the territorial seas and the submerged lands beneath them are held by the federal government.[304] Where the federal government, rather than the state, holds title, the state cannot be the trustee for purposes of the public trust doctrine.[305] It is the federal government who holds title to the territorial seas and the submerged lands beneath them and this title is held for the benefit of the public:

> The federal government holds title to the submerged lands between three and twelve miles from the coastline of the United States. Time and again, the Supreme Court has held that the public trust doctrine applies to lands beneath tidal waters. Because a number of plaintiffs' injuries relate to the effects of ocean acidification and rising ocean temperatures, they have adequately alleged harm to public trust assets.[306]

Where the federal government owns natural resources such as the territorial sea, the public trust doctrine is operable, and it cannot be abdicated by the federal government.[307]

Second, Judge Aiken observed that other courts have ruled that, when the federal government takes state-owned public trust assets under its power of eminent domain, that it takes those assets subject to the public trust.[308] Since the state no longer owns the

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301 *See id.* ("Public trust obligations are inherent aspects of sovereignty; it follows that any case applying the public trust doctrine to a particular state is necessarily a statement of that state's law rather than a statement of the law of another sovereign.").

302 *See* Juliana Complaint, *supra* note 8, at ¶¶ 213–41 (concerning atmosphere), ¶¶ 202–12 (oceans acidification), ¶¶ 307–10 (public trust doctrine claim, which briefly restates plaintiffs' reliance on atmosphere, territorial seas, and climate system).

303 *See Juliana*, 217 F. Supp. 3d at 1255.

304 *See id.* at 1255–56.

305 *See id.* at 1257.

306 *Id.* at 1256.

307 *See id.*

308 *See id.* at 1258–59.

assets, the federal government does not take those assets subject to the *state's* public trust, but under the *federal* public trust.[309] Judge Aiken cited *1.58 Acres of Land*, the case in which the Coast Guard moved to condemn 1.58 acres of waterfront property in Boston for use in a Coast Guard support center.[310] Judge Aiken also cited *City of Alameda*,[311] a case concerning the United States' conveyance of a title to certain tidelands to a private corporation.[312]

Third, Judge Aiken referenced the history of the public trust doctrine to support her conclusion that the doctrine applies to the federal government: "I can think of no reason why the public trust doctrine, which came to this country through the Roman and English roots of our civil law system, would apply to the states but not to the federal government."[313]

IV. *JULIANA* IN THE COURTS

A. Juliana *Goes to Trial . . . Eventually*

Juliana has survived numerous attempts on the part of the federal government to end the lawsuit before the case could go to trial.[314]

On November 17, 2015, the federal government filed a motion to dismiss,[315] arguing that Plaintiffs lacked standing,[316] that Plaintiffs failed to state a claim under the Constitution,[317] and that the District of Oregon lacked jurisdiction over public trust doctrine suits, because they arise under state law rather than federal law.[318] On January 6, 2016, Plaintiffs filed a memorandum in opposition to the government's motion to dismiss,[319] countering that the

309 *See id.*

310 *See id.*; United States v. 1.58 Acres of Land Situated in City of Boston, 523 F. Supp. 120 (D. Mass. 1981) (summarized and discussed in Section II.D).

311 *See Juliana*, 217 F. Supp. 3d at 1258–59.

312 *See* City of Alameda v. Todd Shipyards Corp., 635 F. Supp. 1447, 1448 (N.D. Cal. 1986) (summarized and discussed in Section II.D).

313 *Juliana*, 217 F. Supp. 3d at 1259; *See also* discussion of the history of the public trust doctrine, *supra* Section I.

314 *See Details of Proceedings*, OUR CHILDREN'S TRUST, https://www.ourchildrenstrust.org/federal-proceedings/ (last visited Oct. 31, 2018).

315 *See* Motion to Dismiss, *supra* note 284.

316 *See id.* at 7–18.

317 *See id.* at 19–27.

318 *See id.* at 27–29.

319 *See* Opposition to MTD, *supra* note 290.

public trust doctrine provides a claim against the federal government over which federal district courts have jurisdiction.[320] On November 10, 2016, Judge Aiken issued an order and opinion denying the federal government's motion to dismiss.[321]

On March 7, 2017, the federal government filed a motion to certify an order for interlocutory appeal.[322] In their motion for an interlocutory appeal, the government argued that Judge Aiken's order and opinion decided several controlling questions of law, including the existence of a federal public trust cause of action.[323] It argued that, not only *could* reasonable jurists disagree on the existence of a federal public trust doctrine, but that jurists already *had* disagreed, citing *Alec L. v. Jackson*,[324] *Alec L. ex rel. Loorz v. McCarthy*,[325] and *American Electric Power Co. v. Connecticut*[326] as examples of cases where the courts have ruled that the public trust doctrine is a matter of state law or that any federal public trust doctrine claims are displaced by the Clean Air Act.[327]

The federal government also filed a concurrent motion to stay the litigation while the court considered the motion for an interlocutory appeal to the Ninth Circuit.[328] Plaintiffs opposed the motion for a stay on the grounds that the federal government had failed to show that their claims were likely to succeed on the merits, that the federal government had not demonstrated that it would be irreparably harmed absent a stay, and that issuing a stay

320 *See id.* at 19–27.

321 *See generally* Juliana v. United States, 217 F. Supp. 3d 1224 (D. Or. 2016).

322 *See generally* Memorandum in Support of Federal Defendants' Motion to Certify Order for Interlocutory Appeal, Juliana v. United States, 339 F. Supp. 3d 1062 (D. Or. 2018) (No. 6:15-cv-01517-TC).

323 *See id.* at 5–7.

324 863 F. Supp. 2d 22 (D.D.C. 2012), *aff'd, Alec L. v. McCarthy*, 561 F. App'x 7 (D.C. Cir. 2014).

325 561 F. App'x 7 (D.C. Cir. 2014).

326 564 U.S. 410 (2011).

327 *See generally* Memorandum in Support of Federal Defendants' Motion to Certify Order for Interlocutory Appeal, Juliana v. United States, 339 F. Supp. 3d 1062 (D. Or. 2018) (No. 6:15-cv-01517-TC).

328 *See* Federal Defendants' Motion to Stay Litigation at 1, Juliana v. United States, 339 F. Supp. 3d 1062 (D. Or. 2018) (No. 6:15-cv-01517-TC).

would substantially injure the Plaintiffs' interest and would harm the public interest more generally.[329]

On April 3, 2017, Plaintiffs then filed a memorandum in opposition to the federal government's motion for interlocutory appeal,[330] in which they asserted that there are no substantial grounds for disagreement as to whether a federal public trust doctrine exists.[331] Plaintiffs' critiqued the government's reliance on *Jackson* and *McCarthy*, pointing out that the D.C. Circuit's affirmation of the district court's rulings came in the form of an unpublished disposition without precedential value.[332] The Plaintiffs' asserted that without a court of appeals ruling with precedential authority regarding the existence of the federal public trust doctrine, there was no circuit split to support a finding of substantial grounds for a difference of opinion.[333] A mere disagreement between district courts in different circuits, Plaintiffs alleged, was insufficient grounds to justify an interlocutory appeal, which is a very rarely granted procedure.[334] Plaintiffs also critiqued the *Jackson* and *McCarthy* courts' reliance on *PPL Montana*, contending that *PPL Montana* does not address the existence of the federal public trust doctrine.[335]

On June 8, 2017, Judge Aiken issued an order and opinion denying the federal government's motion for interlocutory appeal and motion to stay the case.[336] Judge Aiken adopted the Magistrate Judge's filings and recommendation advising the district court to deny the motion to certify the case for interlocutory appeal.[337]

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329 *See* Plaintiffs' Response in Opposition to Federal Defendants' Motion to Stay Litigation at 1, Juliana v. United States, 339 F. Supp. 3d 1062 (D. Or. 2018) (No. 6:15-cv-01517-TC).

330 *See* Plaintiffs' Response in Opposition to Federal Defendants' Motion to Certify Order for Interlocutory Appeal, Juliana v. United States, 339 F. Supp. 3d 1062 (D. Or. Apr. 3, 2017) (No. 6:15-cv-01517-TC).

331 *See id.* at 9–19.

332 *See id.* at 12 (citing Alec L. v. Jackson, 561 F. App'x 7, 8 (D.C. Cir. 2014)).

333 *See id.* at 10.

334 *See id.* at 22 (citing Nat. Res. Def. Council v. Cty. of L.A., No. 08-cv-1467-AHM(PLAx), 2011 WL 318543, at *1 (C.D. Cal. Jan. 27, 2011)).

335 *See id.* at 22.

336 *See generally* Juliana v. United States, No. 6:15-cv-01517-TC, 2017 U.S. Dist. LEXIS 88122 (D. Or. June 8, 2017) (order denying motion for interlocutory appeal and motion to stay).

337 *See id.* at *7–8; *see also* Findings & Recommendation, Juliana v. United States, 339 F. Supp. 3d 1062 (D. Or. 2018) (No. 6:15-cv-01517-TC)

On June 9, 2017, the federal government filed a petition for a writ of mandamus[338] with the Ninth Circuit in order to compel the district court to dismiss the case.[339] The government argued that the district court clearly erred in holding that Plaintiffs' public trust doctrine claim against the federal government was actionable[340] and that a writ of mandamus was justified in order to confine the district court to its proper scope of jurisdiction.[341]

On August 25, 2017, Judge Aiken submitted a letter[342] to the Ninth Circuit in response to the federal government's petition for a writ of mandamus, which focused largely on the federal government's claim that it would be irreversibly damaged by proceeding to trial.[343] Judge Aiken responded that any error the district court may have committed could be corrected through the normal course of appealing the district court's final judgment and that the burden of discovery could be reduced by narrowing the scope of discovery and conducting a bifurcated trial, in which Plaintiffs will first have to establish liability before proceeding to the remedial phase of the trial.[344] On August 28, 2017, Plaintiffs filed an answer to the mandamus position, contesting the government's allegations that the district court erred in denying it's motion to dismiss and that the government would be irreparably damaged if the case proceeded to trial.[345] On March 7, 2018, the Ninth Circuit denied the federal government's petition for a writ of mandamus without prejudice.[346]

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338 A writ of mandamus is an order issued by a court to compel a lower court to take a particular action. *See Mandamus*, BLACK'S LAW DICTIONARY (10th ed. 2014).

339 *See* Petition for Writ of Mandamus to the United States District Court for the District of Oregon and Request for Stay of Proceedings in District Court, Juliana v. United States, 339 F. Supp. 3d 1062 (D. Or. 2018) (No. 6:15-cv-01517-TC).

340 *See id.* at 28–31.

341 *See id.* at 31–32.

342 *See* Letter from U.S. District Court, District of Oregon, to the Ninth Circuit Court of Appeals, United States v. U.S. Dist. Court, No. 17-71692 (9th Cir. Aug. 25, 2017).

343 *See id.* at 1–2.

344 *See id.* at 2–3.

345 *See* Answer Real Parties in Interest to Petition for Writ of Mandamus at 23, United States v. U.S. Dist. Court (9th Cir. 2018) (No. 17-71692).

346 *See* United States v. U.S. Dist. Court, 884 F.3d 830 (9th Cir. 2018).

On May 9, 2018, the federal government filed a motion for judgment on the pleadings[347] and a motion for a protective order staying all discovery.[348] The motion for judgment on the pleadings argued that Plaintiffs cannot obtain relief against the president,[349] that the plaintiffs had failed to state a claim under the Administrative Procedure Act,[350] and that the plaintiffs' claims are foreclosed by the separation of powers.[351] On June 15, 2018, Plaintiffs filed their answer to the government's motion for judgment on the pleadings.[352] They argued that a president's unconstitutional conduct is subject to judicial review,[353] that their constitutional claims are not governed by the Administrative Procedure Act,[354] and that the district court had already determined that the government's arguments regarding the separation of powers are premature.[355]

On May 22, 2018, the federal government filed a motion for summary judgment.[356] The government argued that the plaintiffs lacked standing,[357] that Plaintiffs' claims were inadequate as a matter of law,[358] and reiterated their request for an interlocutory appeal.[359] On June 28, 2018, Plaintiffs filed their response in opposition to the federal government's motion for summary

347 *See* Defendants' Motion for a Protective Order and Stay of All Discovery, Juliana v. United States, 339 F. Supp. 3d 1062 (D. Or. May 9, 2018) (No. 6:15-cv-01517-TC).

348 *See* Defendants' Memorandum of Law in Support of Motion for a Protective Order and for a Stay of all Discovery, Juliana v. United States, 339 F. Supp. 3d 1062 (D. Or. May 9, 2018) (No. 6:15-cv-01517-TC).

349 *See id.* at 7–10.

350 *See id.* at 10–16.

351 *See id.* at 22–25.

352 *See* Plaintiffs' Response in Opposition to Defendants' Motion for Judgment on the Pleadings, Juliana v. United States, 339 F. Supp. 3d 1062 (D. Or. June 15, 2018) (No. 6:15-cv-01517-TC).

353 *See id.* at 3–10.

354 *See id.* at 10–18.

355 *See id.* at 19–24.

356 *See* Defendants Memorandum of Law in Support of Motion for Summary Judgment, Juliana v. United States, 339 F. Supp. 3d 1062 (D. Or. May 22, 2018) (No. 6:15-cv-01517-TC).

357 *See id.* at 6–24.

358 *See id.* at 24–30.

359 *See id.* at 30.

judgment.[360] Plaintiffs argued that they have presented facts sufficient to establish their standing,[361] that the district court had already recognized their constitutional claims, which are not governed by the Administrative Procedure Act,[362] that Plaintiffs' claims and requested relief do not violate the separation of powers principles,[363] that material facts are in dispute,[364] and that the district court should not support an interlocutory appeal.[365]

On May 25, 2018, Magistrate Judge Coffin denied a motion for a protective order and stay of all discovery filed by the plaintiffs.[366] On October 15, 2018, Judge Aiken issued an order granting in part and denying in part the federal government's May 9, 2018 motion for judgment on the pleadings, and granting in part and denying in part the federal government's May 22, 2018 motion for summary judgment.[367] Judge Aiken granted the government's motion to dismiss President Trump from the lawsuit without prejudice,[368] denied the government's motion to dismiss the case for failing to state a claim under the Administrative Procedure Act,[369] and declined to dismiss the case based on the government's separation of powers argument.[370] Judge Aiken also declined to revisit her November 2016 opinion,[371] declined to dismiss the entire case based on the separation of powers doctrine,[372] standing,[373] failure to state a claim under the Administration Procedure Act,[374] and separation of powers.[375] Judge Aiken

360 *See* Plaintiffs' Response in Opposition to Defendants' Motion for Summary Judgment, Juliana v. United States, 339 F. Supp. 3d 1062 (D. Or. June 28, 2018) (No. 6:15-cv-01517-TC).

361 *See id.* at 3–27.

362 *See id.* at 28–35.

363 *See id.* at 36–41.

364 *See id.* at 42–52.

365 *See id.* at 54.

366 Juliana v. United States., No. 6:15-cv-01517-TC (D. Or. May 25, 2018) (order denying Defendants' Motion for Protective Order and Stay of Discovery).

367 *See generally* Juliana v. United States, 339 F. Supp. 3d 1062 (D. Or. 2018).

368 *See id.* at 1080.

369 *See id.* at 1084.

370 *See id.* at 1085.

371 *See id.*

372 *See id.* at 1096–1097.

373 *See id.*

374 *See id.*

375 *See id.* at 1097.

reaffirmed her November 2016 opinion on the viability of Plaintiffs' due process claims,[376] held that Plaintiffs had alleged sufficient facts to survive a motion for summary judgment on their state-created danger claims,[377] and reaffirmed her November 2016 holding that the Plaintiffs' public trust doctrine claims are viable.[378] Finally, Judge Aiken held that Plaintiffs' Ninth Amendment claims were not viable as a matter of law[379] and declined to recognize "posterity" as a new suspect class for purposes of equal protection claims,[380] but held that—because Plaintiffs' equal protection and due process claims both involve violation of a fundamental right—Plaintiffs' equal protection and due process claims must be evaluated through the lens of strict scrutiny.[381]

On July 5, 2018, the federal government filed a second writ of mandamus and emergency motion for a stay of discovery and trial under Circuit Rule 27-3 with the Ninth Circuit.[382] The government requested that the Ninth Circuit exercise its authority under the All Writs Act, 28 U.S.C. §1651, to direct the district court to dismiss the case.[383] On July 20, 2018, the Ninth Circuit denied the government's second petition for a writ of mandamus.[384] On July 30, 2018, the U.S. Supreme Court denied the government's motion to stay the case.[385]

On October 5, 2018, the federal government filed a motion to stay discovery and trial pending Supreme Court review of another writ of mandamus, or in the alternative, for a writ of certiorari.[386] On October 15, 2018, the federal government filed a motion *in limine* to exclude expert testimony from six of the plaintiffs'

376 *See id.* at 1097–98

377 *See id.* at 1101.

378 *See id.* at 1102.

379 *See id.*

380 *See id.* at 1103.

381 *See id.* at 1104.

382 *See* Petition for a Writ of Mandamus and Emergency Motion for a Stay of Discovery and Trial Under Circuit Rule 27-3, United States v. U.S. Dist. Court, 895 F.3d 1101 (9th Cir. July 5, 2018) (No. 18-71928).

383 *See id.*

384 *See* United States v. U.S. Dist. Court, 895 F.3d 1101 (9th Cir. 2018).

385 *See* United States v. U.S. Dist. Court, 139 S. Ct. 1 (2018) (order denying application for stay).

386 *See* Defendants' Motion to Stay Discovery and Trial Pending Supreme Court Review, Juliana v. United States, 339 F. Supp. 3d 1062 (D. Or. Oct. 5, 2018) (No. 6:15-cv-01517-TC).

experts.[387] On November 5, 2018, the federal government filed a third petition for writ of mandamus with the Ninth Circuit.[388] During the same time period, the federal government filed an application for stay with the Supreme Court pending a writ of mandamus to the district court.[389]

On October 22, 2018, Plaintiffs filed a response to the government's application for a stay and petition for writ of mandamus.[390] On November 19, 2018, Plaintiffs filed a response to the government's petition for writ of mandamus with the Supreme Court as well as a response to the government's petition for writ of mandamus with the Ninth Circuit.[391]

On November 21, 2018, Judge Aiken certified the case for interlocutory appeal with the Ninth Circuit and stayed the case pending the Ninth Circuit's decision.[392] Judge Aiken's most recent decision was informed by orders issued by the Supreme Court on July 30, 2018 and November 2, 2018, and a November 8, 2018 order of the Ninth Circuit to stay the case.[393]

On December 5, plaintiffs filed a motion for reconsideration of the district court's November 21, 2018 ordered stay of

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387 *See* Defendants' Motion *In Limine* to Exclude Certain Testimony of Six Experts and Memorandum of Points and Authorities in Support Thereof, Juliana v. United States, 339 F. Supp. 3d 1062 (D. Or. Oct. 15, 2018) (No. 6:15-cv-01517-TC).

388 *See* Notice of Filing Petition for Writ of Mandamus Requesting a Stay of District Court Proceedings Pending Supreme Court Review, Juliana v. United States, 339 F. Supp. 3d 1062 (D. Or. Oct. 12, 2018) (No. 6:15-cv-01517-TC).

389 *See* Application for a Stay Pending Disposition of a Petition for a Writ of Mandamus to the United States District Court for the District of Oregon and Any Further Proceedings in this Court and Request for an Administrative Stay, United States v. U.S. Dist. Court, No. 18A-410 (U.S. Oct. 18, 2018).

390 *See* Response Brief of Respondents Juliana, et al., to Petitioners' Application for a Stay Pending Disposition of a Petition for a Writ of Mandamus to the United States District Court for the District of Oregon and Any Further Proceedings in This Court and Request for an Administrative Stay, United States v. U.S. Dist. Court, No. 18A-410 (U.S. Oct. 18, 2018).

391 *See* Brief for Respondents in Opposition to Petition for Writ of Mandamus, United States v. U.S. Dist. Court, No. 18A-410 (U.S. Nov. 19, 2018); Answer of Real Parties in Interest to Petition for a Writ of Mandamus and Emergency Motion under Circuit Rule 27-3, United States v. U.S. Dist. Court, no. 18-73014 (9th Cir. Nov. 18, 2018).

392 *See* Juliana v. United States, No. 6:15-cv-01517-AA, 2018 U.S. Dist. LEXIS 207366 (D. Or. Nov. 21, 2018).

393 *See id.* at *11.

proceedings.[394] Plaintiffs cited the government's recent publication of the Fourth National Climate Assessment and the Second State of the Carbon Cycle Report to bolster their assertion that the harms they face as a result of climate change are growing more irreversible.[395] Plaintiffs requested that the district court reconsider and modify its order to stay the case in order to allow discovery and pre-trial proceedings to take place pending the Ninth Circuit's decision to grant or deny an interlocutory appeal.[396]

On December 10, 2018, Plaintiffs filed their answer in opposition to the government's petition seeking an early appeal before trial with the Ninth Circuit Court of Appeals.[397] On December 20, Plaintiffs filed an emergency motion with the Ninth Circuit Court of Appeals to lift the stay.[398]

On December 26, the Ninth Circuit granted the government's motion for an interlocutory appeal[399] and denied the government's petition for a writ of mandamus as moot.[400] The Ninth Circuit also granted the plaintiffs' motion to expedite the briefing, in an order issued on January 7, 2019.[401] The government filed its opening brief in the interlocutory appeal before the Ninth Circuit on February 7, 2019,[402] and Plaintiffs will file their answer on February 22, 2019.[403]

The young plaintiffs hope to have their day in court. If and when they do, it will be a watershed moment for the development of the public trust doctrine.

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394 Plaintiffs' Motion for Reconsideration of Nov, 21, 2018 Court Ordered Stay of Proceedings in Juliana v. United States (filed in the U.S. District Court of Oregon, Dec. 5, 2018).

395 *See id.* at 1.

396 *See id.*

397 Answer in Opposition to Defendants' Petition for Permission to Appeal in Juliana v. United States (filed in the 9th Cir. Ct. of Appeals Dec 10, 2018).

398 Emergency Motion Under Circuit Rule 27-3 to Lift Stay in Case No. 18-73014, or, Alternatively, Expedite Review of Petitions for Writ of Mandamus (18-73014) and Permission for Interlocutory Appeal (18-80176) in Juliana v. United States (filed in the 9th Cir. Ct. of App. Dec 20, 2018).

399 Order Juliana v. United States, No. 18-80176, (9th Cir. Dec. 26, 2018) (granting motion for interlocutory appeal).

400 Order, Juliana v. United States, No. 18-73014 (9th Cir. Dec. 26, 2018) (denying writ of mandamus as moot).

401 Order, Juliana v. United States, No. 18-36082 (9th Cir. Jan. 7, 2019).

402 Appellants' Opening Brief, Juliana v. United States, No. 18-36082 (filed in 9th Cir. Feb. 7, 2019).

403 *See* Order, Juliana v. United States, *supra* note 401 (setting a Feb. 22 for plaintiffs' answering brief).

B. *Sister Cases and State Courts*

Juliana's legal team is also supporting youth climate lawsuits in the states.[404] Claims are pending in Alaska, Colorado, Florida, Maine, Massachusetts, New Mexico, North Carolina, Oregon, and Washington.[405] In the context of state law, the plaintiffs should find little difficulty in convincing the courts that state governments are subject to the public trust doctrine. The doctrine has developed largely through the state courts,[406] and some states have even written the public trust doctrine into their constitutions.[407]

However, these lawsuits will have to overcome the challenge of persuading the courts that the atmosphere is part of the public trust as defined under each state's public trust doctrine. While the Supreme Court of Pennsylvania has recognized air as part of the public trust,[408] it remains to be seen whether other states will follow suit. Other states may choose to take a more stepwise approach, finding that the plaintiffs' requests for science-based climate policy may be viable based on the connection between the atmosphere and water quality. This would allow state courts to sidestep the question of whether the atmosphere is part of the public trust, just as Judge Aiken did in her November 2016 order and opinion denying the federal government's motion to dismiss.[409]

CONCLUSION

The courts will certainly continue to define the scope and applicability of the public trust doctrine as *Juliana* and its sister atmospheric public trust cases advance or are dismissed in the federal and state courts. There are no easy answers when it comes

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404 *See State Judicial Actions Now Pending*, OUR CHILDREN'S TRUST, https://www.ourchildrenstrust.org/pending-state-actions (last visited Oct. 31, 2018).

405 *See id.*

406 *See supra* Section I.C.

407 *See, e.g.*, Alaska Const. Art. VIII § 3 (reserving the common use of fish, wildlife and waters to the people); Cal. Const. Art. X § 2 (conservation of water resources in order to ensure the reasonable and beneficial use for the people); Pa. Const. Art. I § 27 (preserving the right of current and future generations to the public natural resources of the state, including pre air and water, as well as a right to having the state preserve, as a trustee, other values of the environment).

408 *See* Robinson Twp. v. Commonwealth, 83 A.3d 901, 955 (Pa. 2013).

409 *See* Juliana v. United States, 339 F. Supp. 3d 1062 (D. Or. 2018).

to the public trust doctrine, but history, science, and law point to the possibility of including air within a federal public trust doctrine. Air has been included as a public trust resource since the time of the Institute of Justinian,[410] and U.S. courts have treated it as a public resource.[411] Modern science, which has shaped the evolution of the public trust doctrine in this country, has shown a clear connection between air and water quality. Specifically, science has shown a connection between increased atmospheric concentrations of greenhouse gases and warmer oceans and navigable waters, greater ocean acidity, and lower oxygen levels.[412]

Elevated levels of greenhouse gases have also been directly linked to compromises in public resources held in trust by the federal government.[413] Puerto Rico and the U.S. Virgin Islands have been devastated by stronger storms made more probable by a warmer, wetter world.[414] These territories' navigable waters, which are held in trust by the federal government for the benefit of the people and potential future states, have been threatened by the risk of flooding of superfund sites.[415] Additionally, traditional public trust uses including navigation and fishing have been compromised by the storm.[416]

Elevated levels of greenhouse gases also raise the temperature of the territorial seas, affecting the fish population at every stage of the life cycle.[417] This puts additional stress on deep sea fisheries at a time when fish stocks are already falling.[418] Climate change is threatening one of the most traditional of public trust uses—the right to fish the seas.[419] In this scenario, the federal government is

410 *See* INSTITUTES OF JUSTINIAN, *supra* note 20, at 78.

411 *See Robinson Twp*., 83 A.3d at 954-956; Georgia v. Tenn. Copper Co., 206 U.S. 230, 237 (1907); United States v. Causby, 328 U.S. 256 (1946).

412 *See, e.g.*, Biello, *supra* note 1.; Kolbert, supra note 169; NASA, *Carbon Cycle*, *supra* note 171; NOAA, *Ocean Acidification*, supra note 1.

413 *See* Sneed, *supra* note 221; EPA, *supra* note 240.

414 *See* Sneed, *supra* note 221.

415 *See* EPA, *supra* note 240. (discussing impact of the hurricane on surface water quality and navigable waters in Puerto Rico).

416 *See id.*

417 *See, e.g.*, Biello, *supra* note 1; NOAA, *Ocean Acidification*, supra note 1.

418 *See* Alister Doyle, *Ocean Fish Numbers Cut in Half Since 1970*, SCI. AM. (Sept. 16, 2015), https://www.scientificamerican.com/article/ocean-fish-numbers-cut-in-half-since-1970/; Biello, *supra* note 2.

419 *See* FORDHAM UNIVERSITY: INTERNET HISTORY SOURCEBOOKS PROJECT, *supra* note 25; *see also* Borough of Neptune City v. Borough of Avon-by-the-

the sovereign and trustee of the territorial seas, with a concomitant responsibility to preserve the seas in trust for the people.[420]

When considering these issues together—the traditional inclusion of air within the public trust, the connection between air and navigable waters and other well-established public trust resources, and federal authority over trust resources in the U.S. territories and territorial seas—points to the existence of a federal atmospheric public trust.

With the retirement of Justice Kennedy from the Supreme Court, it is difficult to know whether the plaintiffs will prevail if their case is appealed all the way to the Supreme Court. But they have, in any case, fleshed out the nexus between water and sky, between aquatic public trust resources and the atmosphere.[421] They have shown how the concentration of CO_2 and methane in the atmosphere has endangered the water they drink and the fish they eat.[422] They have shown that we cannot safeguard the aquatic public trust without protecting the atmospheric public trust.[423]

This connection between the aquatic and the atmospheric public trust has also laid the groundwork for other plaintiffs. For example, the fishing industry might sue federal or state government agencies for failing to restrain the fossil fuel industry. They could credibly argue that high concentrations of CO_2 in the atmosphere acidify the ocean, decimating oysters, crabs, mussels, and any sea creature that grows a shell. Similarly, the fishing industry could argue that warming air leads to warming waters, which threatens already faltering fish stocks.

Furthermore, communities hit by hurricanes could sue federal or state governments for failing to rein in the fossil fuel industry. These communities can now point to emerging science showing

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Sea, 294 A.2d 47, 54 (N.J. 1972) (referencing the ancient prerogatives of navigation and fishing).

420 *See* Proclamation No. 5,928, 54 Fed. Reg. 777 (1989), *reprinted in* 103 Stat. 2,982, https://www.gpo.gov/fdsys/pkg/STATUTE-103/pdf/STATUTE-103-Pg2981.pdf ("The territorial sea of the United States henceforth extends to 12 nautical miles from the baselines of the United States determined in accordance with international law."); *see also* United States v. California., 332 U.S. 19, 40 (1947).

421 *See* Juliana Complaint, *supra* note 8, at ¶¶ 263–76.

422 *See id.* at ¶¶ 18, 38, 42, 45, 62, 70, 78, 83, 90, 134, 226, 232, 235, 236, 249, 259 (alleging harms to drinking and fishing; *id.* at ¶¶ 45, 134 (alleging climate impacts such as increased temperature).

423 *See id.* at ¶¶ 256–262.

that rising atmospheric temperatures lead to high ocean surface temperatures, which fuel more powerful and destructive hurricanes.[424] They can trace the damage to their waterways, as storm surge and inland flooding causes the sewers to overrun and the manure lagoons to overflow, fouling surface waters and threatening the supply of drinking water and fresh water fish.

The young plaintiffs, who have come forward on their own behalf as well as on behalf of future generations, have done so in reliance on an ancient, robust, and flexible legal tradition. The public trust doctrine predates the existence of our country and its institutions,[425] and it will—let us hope—survive the struggle for power now playing out in American politics that has now bled into the judiciary. The young plaintiffs, who have so vividly illustrated the interconnectedness of water and air, may yet carry the day under Justinian's banner by extending the public trust doctrine to atmosphere.

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424 *See Global Warming and Hurricanes: An Overview of Current Research Results*, NOAA GEOPHYSICAL FLUID DYNAMICS LABORATORY, https://www.gfdl.noaa.gov/global-warming-and-hurricanes/ (last visited Nov. 2, 2018) (noting that both sea surface temperatures and power dissipation index have "risen sharply since the 1970s" and concluding that increased sea surface temperatures will likely lead to more intense tropical cyclones globally).

425 *See* Juliana v. U.S., 217 F. Supp.3d 1224, 1260-61 (D. Or. 2016) ("The public trust doctrine defines inherent aspects of sovereignty. The Social Contract theory, which heavily influenced Thomas Jefferson and other Founding Fathers, provides that people possess certain inalienable rights and that governments were established by consent of the governed for the purpose of securing those rights. Accordingly, the Declaration of Independence and the Constitution did not create the rights to life, liberty, or the pursuit of happiness — the documents are, instead, vehicles for protecting and promoting those already-existing rights. Governments, in turn, possess certain powers that permit them to safeguard the rights of the people; these powers are inherent in the authority to govern and cannot be sold or bargained away. . . . *[T]he public trust predates the Constitution*, plaintiffs' right of action to enforce the government's obligations as trustee arises from the Constitution.") (internal citations omitted) (emphasis added).