

Chapter 6

Atmospheric Trust Litigation Across the World¹

Mary Christina Wood²

Leading climate scientists warn that Earth is in ‘imminent peril’, on the verge of runaway climate heating that will impose catastrophic conditions on generations to come.³ In their words, continued carbon pollution will cause a ‘transformed planet’⁴ – an Earth obliterated of some major fixtures, including the polar ice sheets, Greenland, the coral reefs, and the Amazon forest. The trajectory of civilization over the past century threatens to trigger the planet’s sixth mass extinction – the kind that has not occurred on Earth for 65 million years.⁵ Should business as usual continue even for a few more years, future humanity for untold generations will be pummelled by floods, hurricanes, heat waves, fires, disease, crop losses, food shortages, and droughts as part of a hellish struggle to survive in deadly greenhouse conditions.⁶ In a world of runaway climate heating, these unrelenting disasters would force massive human migrations and cause staggering numbers of deaths – culminating in, as more and more analysts predict, humanity’s own ‘self-destruction’.⁷ As author Fred Pearce states: ‘Humanity faces a genuinely new situation ... a crisis for the entire life-support system of our civilization and our species’.⁸

1 This article has adapted portions of the following works: Wood (2011 forthcoming); Wood (2009); Wood (2010).

2 Research assistance was provided by John Mellgren, Bowerman Fellow in the Environment and Natural Resources Law Program, University of Oregon School of Law. The author wishes to thank Tim Hicks, David Takacs, Joe Fox, Tim Duane, and Tom Athanasiou for helpful comments on an earlier draft.

3 Hansen et al. (2007a); Connor (2007).

4 Hansen (2006b).

5 Boitnott (2008).

6 See Ban Ki-moon (2009): ‘The evidence is all around us. And unless we act, we will see catastrophic consequences including rising sea-levels, droughts and famine, and the loss of up to a third of the world’s plant and animal species’; The University of New South Wales Climate Change Research Centre (2009); United States Global Change Research Program, Global Climate Change Impacts in the United States (2009); Lean (2007).

7 See Romm (2008b).

8 Pearce (2007), p. 239; see also Gore (2007): ‘This is a moral issue, one that affects the survival of human civilization Put simply, it is wrong to destroy the habitability of our planet and ruin the prospects of every generation that follows ours.’

In order to stem global warming, the law must recognize and calibrate to the physical, chemical, and biological requirements for achieving climate equilibrium. Such requirements are set by nature, not politicians. Stated another way, averting climate disaster is a matter of carbon math, not carbon politics. Scientists warn that the world has only a short time to begin reversing global emissions of carbon before the planet passes a 'tipping point'⁹ – a point at which dangerous feedback loops will unravel the planet's climate system despite any subsequent carbon reductions achieved by humanity.¹⁰ The Ninth Circuit Court of Appeals has recognized the danger of the tipping point, stating in one climate case: 'Several studies also show that climate change may be non-linear, meaning that there are positive feedback mechanisms that may push global warming past a dangerous threshold (the 'tipping point')'.¹¹ In another climate case, the federal district court of Vermont found reliable the 'tipping point' theory of non-linear climate change advanced by NASA scientist James Hansen under the *Daubert* standard, stating: '[The] 'tipping point' theory posits that at a certain point the changes associated with global warming will become dramatically more rapid and out of control. ... [D]rastic consequences, including rapid sea level rise, extinctions, and other regional effects, would be inevitable with a two to three degrees Celsius warming expected if no limits are imposed and emissions continue at their current rate. *Such changes could happen quickly once a tipping point is passed.*'¹²

While just recently scientists believed the 'tipping point' would be triggered at 450 parts per million (ppm) of atmospheric carbon dioxide, the dangerous threshold is now thought to be at, or even well under, 350 ppm.¹³ Present levels

9 Pearce (2007), pp. xxiv, 63, 75, 77–8; Ban Ki-moon (2009). 'This report shows that climate change is accelerating at a much faster pace than was previously thought by scientists. New scientific evidence suggests important tipping points, leading to irreversible changes in major Earth systems and ecosystems, may already have been reached or even overtaken.'

10 See Hansen (2007b) 'In the past few years it has become clear that the Earth is close to dangerous climate change, to tipping points of the system with the potential for irreversible deleterious effects.'; Hansen (2006), part 3: '[B]ecause of the global warming already bound to take place as a result of the continuing long-term effects of greenhouse gases and the energy systems now in use, ... it will soon be impossible to avoid climate change with far-ranging undesirable consequences. We have reached a critical tipping point.'; Hansen et al. (2007a), note 3, pp. 1925, 1949 (discussing positive feedback loops); Hansen et al. (2007b), p. 2303: '[W]e must be close to such a point, but we may not have passed it yet'.

11 See *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, 508 F3d 508, 523 (9th Cir 2008).

12 *Green Mountain Chrysler v Crombie*, 508 F Supp 2d 295, 313–17 (D Vermont 2007) (emphasis added) (stating also, 'Hansen's testimony is based on sufficient facts and data and reliable methods, applied reliably to the facts.'). See also *Daubert v Merrill Dow Pharmaceuticals, Inc.*, 509 US 579 (1993).

13 Hansen et al. (2008), p. 2; see Bill McKibben (2007); (2009) 'UN Scientists back "350" Target for CO2 Reduction'.

are at 390 ppm and climbing by 2 ppm a year.¹⁴ Leading scientists warn that, if humanity follows business as usual for even another few years, it will 'lock in' future catastrophic global heating.¹⁵

These circumstances have hurled the Earth into a state of planetary emergency.¹⁶ In 2007, the head of the United Nation's climate panel told the world: 'What we do in the next two to three years will determine our future. This is the defining moment'.¹⁷ Immediate and decisive action to slash carbon pollution is imperative. Yet, despite this planetary crisis, there has been little action at either the international or national level. This may well be due to the fossil fuel industry's influence over political leaders, economies, and governmental systems worldwide.¹⁸ While such political dynamics are too complex to explore here, exclusive reliance on the political branches for climate response now seems ill-advised.

14 Adam (2008); Hansen et al. (2011). While the 350 target has been exceeded, climate scientists still offer hope of atmospheric stability if the 'overshoot' is brief. Hansen et al. (2008): 'If the present overshoot of this target CO₂ is not brief, there is a possibility of seeding irreversible catastrophic effects'.

15 See Hansen (2007b), '[I]gnoring the climate problem at this time, for even another decade, would serve to lock in future catastrophic climatic change and impacts that will unfold during the remainder of this century and beyond ...'; Hansen (2007a): 'If we do follow that [Business as Usual] path, even for another ten years, it guarantees that we will have dramatic climate changes that produce what I would call a different planet...'; Hansen (2006a): 'How long have we got? We have to stabilize emissions of carbon dioxide within a decade, or temperatures will warm by more than one degree. That will be warmer than it has been for half a million years, and many things could become unstoppable'. A disturbing United Nations IPCC report indicates that the planet has already reached the danger point of atmospheric carbon dioxide equivalent concentrations, indicating that a decade is far too long to achieve significant greenhouse gas reduction. See Lamb (2007), discussing report and quoting climate scientist Tim Flannery, '[A]lso we have really seen an unexpected acceleration in the rate of accumulation of CO₂ itself, and that's been beyond the limits of projection ... beyond the worst-case scenario. We are already at great risk of dangerous climate change – that's what the new figures say ... [I]t's not next year, or next decade; it's now'.

16 Spratt and Sutton (2008), pp. 222–40.

17 Rosenthal (2007), quoting Rajendra Pachauri. Of course, it bears noting that, while major scientific associations and the United Nations express urgency, some scientific views may land on the opposite side of the spectrum. In that vein, it is important to recognize that many scientific hypotheses relating to climate change, particularly those involving the tipping point, can not or may not be validated until it is too late; it is thus necessary to apply the precautionary principle in order to leave options open for humanity. Notably, in finding the testimony of Dr James Hansen reliable as to the tipping point, the federal District Court of Vermont stated, 'Hansen's predictions need not be certainties to be admissible under Rule 702, nor need his estimates of the timing and amount of sea level rise be exact to be admissible. ... There is widespread acceptance of the basic premises that underlie Hansen's testimony'. *Green Mountain Chrysler v Crombie*, 508 F. Supp 2d 295, 317–19 (D Vermont 2007).

18 See generally, Gelbspan (2004) p. 61; Goodell (2006).

This chapter explains a legal strategy called Atmospheric Trust Litigation (ATL)¹⁹ that calls upon the judicial branches of governments worldwide to force carbon reduction on the basis of their fiduciary responsibility to protect the public trust. ATL seeks to accomplish, through decentralized domestic litigation in countries across the globe, what has thus far eluded the centralized, international diplomatic treaty-making process. The strategy draws upon fundamental principles of sovereign trust obligation to provide a framework that holds governments accountable for forcing carbon reduction within their own countries. The ATL approach is consistent with, and gives meaning to, the principles declared in the United Nations Framework Convention on Climate Change (UNFCCC), agreed to in 1992 by 192 nations, representing ‘near universal’ international membership.²⁰ Notably, in the United States, the UNFCCC still exists as a ratified treaty – which gives it Constitutional rank as the ‘supreme law of the land’.²¹ The ATL approach neither hinders nor forecloses any possibility for future international frameworks to address climate crisis, but rather, if successful, would infuse a strong fiduciary obligation into what has so far been a wholly discretionary diplomatic process.

This chapter begins first by describing government inaction worldwide and explaining the need for a swift legal strategy to hold sovereigns accountable for their pollution. Second, it explains the public trust doctrine, which provides the basis for ATL. It then describes the elements of an ATL claim and a remedy that would provide effective redress for government’s recalcitrance. The chapter concludes with remarks on the judicial role in a time of planetary crisis. While ATL bears the risk of any untested strategy, it is perhaps the only macro approach that can empower courts to force emissions reductions within the limited time-frame that remains before the planet crosses critical climate thresholds.

Governmental Inaction

In December 2009, nations of the world gathered in Copenhagen, Denmark, for the United Nations Conference on Climate Change. Although the Conference resulted in a resolution that has been joined by many industrialized nations (including most of the major greenhouse gas emitters such as the United States, China, India, Brazil, Australia, and members of the European Union), the Copenhagen Accord is widely regarded as a failure.²² It is not legally binding, and many pledges are

19 For additional materials on ATL, see *supra* n. 1.

20 United Nations Framework Convention on Climate Change (1992).

21 United States Constitution, Art. VI.

22 United Nations Framework Convention on Climate Change, Copenhagen Accord, FCCC/CP/2009/L.7 (18 Dec. 2009), available at <http://unfccc.int/resource/docs/2009/cop15/eng/107.pdf>; for commentary, see Vidal et al. (2009).

contingent on action taken by other nations.²³ A UN analysis showed that, even if the various national pledges were fulfilled, the total combined carbon reduction would still bring about a 3 °C temperature rise, capable of triggering catastrophic climate change.²⁴ The United States, for example, remains a recalcitrant global polluter, having offered only a meagre reduction proposal at the Copenhagen Conference. Though the United States emits nearly 16 per cent of the world's global greenhouse gases,²⁵ President Obama expressed a willingness to reduce United States greenhouse gas emissions by only 17 per cent (below 2005 levels) by 2020.²⁶ His choice of a 2005 baseline made the pledge appear far larger than it was – 17 per cent equates to only a two per cent decline over 1990 levels.²⁷ Moreover, President Obama made the United States position contingent on the passage of energy legislation before the United States Congress – which, as of summer 2010, was a dead letter.²⁸

Surely a robust, enforceable, international agreement would be the preferred vehicle for a solution to a global crisis such as planetary heating. It is understandable that so many climate advocacy groups poured resources and energy into influencing the world's governments to arrive at one. But the failure of the Copenhagen Conference calls into serious question the continued wisdom of relying on international negotiations as a mechanism to force pollution reduction. Even the Kyoto Protocol, which was negotiated in 1997, which included a broad range of signatories, and which contained numerical emissions reduction targets,

23 United Nations Framework Convention on Climate Change, Copenhagen Accord, FCCC/CP/2009/L.7 (18 Dec. 2009), available at <http://unfccc.int/resource/docs/2009/cop15/eng/107.pdf>.

24 See Goldenberg et al. (2009). In-depth subsequent analysis of the Copenhagen pledges shows that they are something of a sham in that their total aggregate 'reduction' would amount to emissions above 1990 levels. As Tom Athanasiou, an analyst at EcoEquity, summarizes analysis of the Stockholm Environmental Institute in his blog post of 11 August 2010: 'In fact, even when conservative assumptions are used, *the Copenhagen pledges contain so many loopholes that, taken together, they sum to 21% of 1990 emissions, a number that entirely negates the pledges themselves!* So that the official, well-publicized global 2020 emissions reductions target of 12–18% actually means that emissions levels large enough to reach 3–9% above 1990 would be allowed. Which is ... actually more than the business-as-usual projection!). See *You Want Loopholes With That?*, available at <http://www.ecoequity.org/2010/08/> (emphasis in original).

25 World Resources Institute, Climate Analysis Indicator Tool (2005) (includes land-use change and forestry).

26 Friedman (2010).

27 Duane (2010).

28 Letter from the United States Special Envoy for Climate Change to the Executive Secretary of the United Nations Framework Convention on Climate Change, 28 Jan. 2010, available at <http://www.usclimatenetwork.org/resource-database/us-inscription-to-the-unfccc-on-the-copenhagen-accord>.

largely failed.²⁹ The United States, one of the largest global polluters, never ratified its commitment of the Protocol. Moreover, few of the signatory countries to the Protocol ended up meeting their reduction commitments.³⁰ The fact remains that, due to the autonomy of nations and the lack of any world 'super-jurisdiction', there is no way to directly force sovereigns to reduce carbon emissions. Because the bottom line for international law is, unfortunately, voluntary compliance, exclusive reliance on international treaty negotiations to achieve global carbon reduction is perilous.

On the domestic level within various nations, one could hope for national legislation. For example, there have been enormous efforts to pass such legislation within the United States, a country that produces a lion's share of the globe's pollution and that has the most extensive set of environmental laws in the world. But the reality is that the US Congress remains beholden to the fossil fuel industry, which spent a whopping \$514 million over eighteen months lobbying against a climate bill, until prospects for legislation came to a 'crashing demise' in summer, 2010.³¹ Leading climate advocates admit that 'hope for any sweeping or comprehensive measure is probably gone'.³² Even if a bill emerges, it is not likely to be adequate. The bills proposed thus far have fallen far short of providing sufficient reduction.³³

The judicial branch should hold government to its legal responsibilities. So far, however, though many lawsuits have been filed, none have forced the carbon reduction needed to curb runaway atmospheric heating. In the US, for example, most lawsuits are structured around statutory mandates; plaintiffs have sued under the Clean Air Act, NEPA, the Endangered Species Act, and other statutes.³⁴ So far, these claims have not delivered any meaningful aggregate relief. In general, this may be because environmental statutory law (at least in the United States and perhaps in many other countries as well) has degenerated into an embrace of administrative political discretion.³⁵ The vast majority of agencies use their discretion to allow projects that cause significant environmental damage.³⁶ The statutes themselves are a major engine of environmental destruction: two-thirds of the greenhouse gas pollution in the United States is emitted pursuant to

29 Kyoto Protocol to the United Nations Framework Convention on Climate Change, 10 Dec., 1997, 37 I.L.M. 32.

30 Zarembo (2007).

31 (2010) 'The Changing Climate For Environmental Legislation'.

32 (2010) 'The Changing Climate For Environmental Legislation'.

33 See Coplan (2010) (surveying cap-and-trade proposals and concluding that they would allow emissions 'far in excess' of scientific recommendations).

34 For an overview of litigation, see generally Hildreth et al.; Hunter et al. (2009).

35 See Wood (2010a); Wood (2009b); Kennedy Jr (2005). (Federal agencies in the Bush II administration 'have given quick permit approvals and doled out waivers that exempt campaign contributors and polluters from rules or regulations'.)

36 See generally Collins (2010); see also Speth (2008).

government-issued permits.³⁷ Even where a statutory lawsuit is successful, it often fails to deliver meaningful relief. Remedies usually take the form of procedural remands to the agency, returning the matter to the same highly political process that produced the case in the first place. Moreover, statutes, which are typically narrow in scope, fracture government's overall climate responsibility into isolated, disjointed parts. Statute-based strategies – while nevertheless important in many respects – tend to diffuse the climate litigation effort and drain it of practical force in addressing the magnitude of climate crisis. Nuisance lawsuits are also micro in nature, targeted against only specific polluting parties. They arise in absence of adequate regulation and do not get at the underlying problem of government recalcitrance in addressing a mounting ecological calamity.³⁸

Climate crisis demands broad, system-changing solutions and doctrines. The judiciary is potentially a crucial player in forcing carbon reduction because it tends to be a less politicized branch of government (in most, though certainly not all, countries) with power to order swift and decisive relief. But, for litigation to have any meaningful effect before the planet slips over irrevocable climate thresholds, litigators must present courts with macro-level claims that address government's full obligation to protect the atmosphere. Moreover, such claims must find their premise in government obligation, not discretion, which is readily hijacked by politically powerful interests. Finally, such claims must be linked to a premise that has global reach and transcends different legal systems and cultures.

The legal foothold for Atmospheric Trust Litigation (ATL) is the ancient public trust doctrine, which imposes a strict fiduciary obligation on government to protect natural resources in trust for the citizens.³⁹ The ATL strategy presents a macro-level approach to climate crisis by focusing on the atmosphere as a single asset in its entirety. It characterizes all nations on Earth as co-tenant sovereign trustees of that asset, bound together in a property-based framework of corollary and mutual

37 Kosloff and Trexler (2007).

38 In the United States, states and private parties have brought climate nuisance actions against major carbon polluters. In *Connecticut v American Electric Power*, 406 F. Supp 2d 265 (SD NY 2005), rev'd, 582 F3d 309 (2nd Cir 2009), cert granted, 131 S Ct 813 (2010), several states sought an injunction against major coal burning utilities. At the time of this writing, the suit was pending before the US Supreme Court. For additional nuisance actions, see *California v General Motors Corp.*, 2007 WL 2726871 (ND Cal 2007) (settled on appeal); *Comer v Murphy Oil Co.*, No. 05-CV-436L Q (SD Miss, 20 Aug., 2007), rev'd in part, 585 F3d 855 (5th Cir 2009), judgement vacated, rehearing en banc granted, subsequently dismissed (for lack of quorum), 607 F3d 1049 (5th Cir 2010); *Native Village of Kivalina v Exxon Mobil Corp.*, 663 F Supp 2d 863 (ND Cal, 2009), appeal pending before Ninth Circuit Court of Appeals. These cases are all based on the tort of public nuisance, which the Restatement defines as an 'unreasonable interference with a right common to the general public'. Restatement (Second) of Torts section 821B.

39 For sources and materials on the public trust doctrine, see Laitos et al. (2006), Chapter 8.II. For discussion of the public trust doctrine, see Sax (1970); Dunning (1989); Wood (2009b), part 1.

responsibilities. The seeds of the public trust doctrine are evident in legal systems worldwide and accessible to lawyers across the globe.

The Public Trust Doctrine

The public trust doctrine has flowed through countless forms of government through the ages of humanity. At its core, the doctrine is a declaration of public property rights as originally and inherently reserved through the peoples' social contract with their sovereign governments. Under this principle, the public holds a perpetual common property interest in crucial natural resources. Government, as trustee, must act in a fiduciary capacity to protect such natural assets for the beneficiaries of the trust, which include both present and future generations of citizens.⁴⁰ As the United States Supreme Court said in *Geer v Connecticut*, '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'.⁴¹ The legislature is primary trustee; the executive branch, acting as agent of the trustee, is vested with the same public trust obligation.⁴² As the Supreme Court of India once summarized the public trust doctrine in a landmark case:

The State is the trustee of all natural resources which are by nature meant for public use and enjoyment. [The] public at large is the beneficiary of the sea-shore, running waters, airs, forests and ecologically fragile lands. The State as a trustee is under a legal duty to protect the natural resources. These resources meant for public use cannot be converted into private ownership.⁴³

Having origins in indigenous systems, the principle finds expression in such venerable codes as the Institutes of Justinian⁴⁴ and the Magna Carta. It manifests in

40 See *Illinois Cent. R. Co. v Illinois*, 146 US 387, 455 (1892); *Arizona Ctr. for Law in the Pub. Interest v Hassell*, 837 P2d 158, 169 (Ariz Ct App 1991) ('The beneficiaries of the public trust are not just present generations but those to come').

41 161 US 519, 533–34 (1896).

42 See *Geer v Connecticut*, 161 US 519, 533–34 (1896) (legislature as trustee); *Center for Biological Diversity v FPL Group*, 2008 WL 4255789, slip op. at 6, 8 (Cal App 1 Dist, 18 Sept., 2008) (discussing public trust obligations of 'public agencies'); *In Re Water Use Permit Applications, Waihole Ditch Combined Contested Case Hearing* (hereinafter, *Waihole Ditch*), 94 Haw 97, 9 P3d 409 (Haw 2000) (applying public trust obligations to state agency).

43 *M. C. Mehta v Kamal Nath*, 1997 1 SCC (1997), at Par 34, cited in Takacs (2008), at n. 135–7 and accompanying text.

44 See Justinian, Institutes, 1.2.1, 2.1.1 (T. Sandars trans. 1st Am. edn 1876); discussed in *Arizona Center For Law In Public Interest v Hassell*, 837 P2d 158, 166, n. 12

a multitude of court decisions, constitutions, and statutes from around the world.⁴⁵ The endurance and prevalence of this doctrine is not at all surprising since it speaks to the most fundamental and intuitive rationale of government itself. Ranking among the most essential purposes of government is the necessity of protecting natural assets for the common benefit of the people and their society. The doctrine recognizes that, left in altogether private hands, increasingly scarce assets would be consumed with selfish intent to the detriment of all, ultimately leading to chaos and societal collapse. Indeed, this ancient and enduring principle has roots and reasoning that put it on par with the highest liberties of citizens living in a free society. As Professor Joseph Sax said decades ago in a landmark article, certain environmental interests protected by the public trust doctrine ‘are so intrinsically important to every citizen that their free availability tends to mark the society as one of citizens rather than of serfs’.⁴⁶

The Trust as an Attribute of Sovereignty

The public trust is best understood as a principle organic to government itself – an inherent constitutional restraint on legislative power, and a fundamental expression of legislative duty.⁴⁷ In a leading modern trust case, the Hawaii Supreme Court noted, ‘[H]istory and precedent have established the public trust as an inherent attribute of sovereignty ...’.⁴⁸ As one commentator summarizes the field: ‘The idea that public trust limits and powers inhere in the very nature of sovereignty is one consistent thread in public trust cases.’⁴⁹ Characterized as an attribute of sovereignty, the principle has force in the United States context, for example, at both the federal and state levels, though nearly all cases in the United States have involved the states (not surprisingly, because the states were

(Ariz App Div I 1991) (discussing the ‘ancient doctrine of common law’ that ‘restricts the sovereign’s ability to dispose of resources held in public trust’); *1.58 Acres of Land*, 523 F Supp at 122 (D Mass 1981) (‘Public trust theory has its roots in the Roman law’); Kennedy (2005), pp. 20–21 (stating that the Ancient Roman Code of Justinian ‘guaranteed to all citizens the use of the “public trust”, or commons – those shared resources that cannot be reduced to private property, including the air, flowing water, public lands, wandering animals, fisheries, wetlands, and aquifers’).

45 See section in this chapter, *The Public Trust Doctrine in Legal Systems Around the World*.

46 Sax (1970) p. 484.

47 See Grant (2001), p. 851: explaining the public trust doctrine as part of the constitutional reserved powers doctrine, which prevents any one legislature from taking acts that would compromise a future legislature’s ability to exercise sovereignty on behalf of the people.

48 *Waihole Ditch* 94 Haw 97, 130–31 (Haw 2000). See also Stevens (1980), p. 196: noting jurisprudence ‘in the form of declarations that the public trust is inalienable as an attribute of sovereignty no more capable of conveyance than the police power itself’.

49 Coplan (2010), p. 311.

historically the primary managers of waters, wildlife, and other resources).⁵⁰ One federal district court that explored the dual federal and state roles in the context of tidelands concluded: ‘Since the trust impressed upon this property is governmental and administered jointly by the state and federal governments by virtue of their sovereignty, neither sovereign may alienate this land free and clear of the public trust...’.⁵¹ Increasingly, commentators urge application of the doctrine to federal resource managers.⁵²

As a limitation on sovereignty and an expression of fundamental sovereign responsibility, the trust ‘can only be destroyed by the destruction of the sovereign’.⁵³ In a landmark trust case, *Illinois Central Railroad v Illinois*, the United States Supreme Court declared that legislatures may not repudiate, abridge, or surrender their trust obligation:

The state can no more abdicate its trust over property in which the whole people are interested ... than it can abdicate its police powers in the administration of government and the preservation of the peace Every legislature must, at the time of its existence, exercise the power of the state in the execution of the trust devolved upon it.⁵⁴

As a property-based counterweight to discretionary police power, the trust secures the people’s rights to a sustained natural endowment. As one commentator describes, ‘Its overarching principle ... is that certain gifts of nature – pure air, clean water, a stable climate, and healthy ecosystems – belong to everyone and cannot be appropriated for exclusively private use’.⁵⁵ Under the public trust doctrine, government trustees may not allow private interests to cause irrevocable harm to critical public trust resources. Stated another way, government trustees, who serve only at the will of the public, may not allocate private rights to destroy what the people legitimately own for themselves and for their posterity. As the United States Supreme Court said in *Geer v Connecticut*:

50 See discussion at Turnipseed et al. (2010), p. 10: ‘[N]o one has forced the issue at the national level in the way that it has been pushed at the state level’ (remarks of Patrick Parenteau).

51 *US v 1.58 Acres of Land*, 523 F Supp 120, 124 (D Mass 1981).

52 See, for example, Coplan (2010), pp. 313–15 (summarizing other scholarship and concluding that the doctrine applies to the federal government, stating, ‘If ... the public trust is essential to the nature of sovereignty and encompasses rights reserved to the people generally, then the doctrine applies equally to the sovereign federal government as it does to the sovereign state governments’); see also Glicksman (2008).

53 *1.58 Acres of Land*, 523 F Supp at 124.

54 *Illinois Central*, 146 US at 453, 460.

55 Turnipseed et al. (2010), p. 8 (remarks of Patrick Parenteau). As another commentator put it, the doctrine ‘holds that some of Earth’s riches should never be sequestered for private use, must be left for the public’s enjoyment, and must be stewarded by those in power’. Takacs (2008), p. 711.

[T]he power or control lodged in the State, resulting from this common ownership, is to be exercised, like all other powers of government, 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, or for the benefit of private individuals as distinguished from the public good [T]he ownership is that of the people in their united sovereignty.⁵⁶

The seminal public trust opinion in the United States is *Illinois Central Railroad Co. v Illinois*, where the Supreme Court announced that the shoreline of Lake Michigan was held in trust by the State of Illinois and could not be transferred out of public ownership to a private railroad corporation. In broad language expressing the public's fundamental right to natural resources, the Court stated:

[T]he decisions are numerous which declare that such property is held by the state, by virtue of its sovereignty, in trust for the public. The ownership of the navigable waters of the harbor, and of the lands under them, is a subject of public concern to the whole people of the state. The trust with which they are held, therefore, is governmental, and cannot be alienated⁵⁷

Unlike the permissive bent of administrative discretion, which accompanies most of statutory law, public trust law imposes a strict fiduciary obligation upon sovereign trustees to protect the people's trust assets from damage.⁵⁸ Under well-established principles of trust law, trustees may not sit idle and allow damage to occur to the trust. As one leading treatise explains, 'The trustee has a duty to take whatever steps are necessary . . . to protect and preserve the trust property from loss or damage'.⁵⁹ Scores of cases emphasize this duty of protection.⁶⁰

56 *Geer*, 161 US at 529. See also *Lake Michigan Federation v US Army Corps of Engineers*, 742 F Supp 441, 445 (D Ill 1990) ('[T]he public trust is violated when the primary purpose of a legislative grant is to benefit a private interest').

57 *Illinois Cent R Co*, 146 US at 455. The court also noted that parcels could be alienated 'when parcels can be disposed of without detriment to the public interest in the lands and waters remaining', at 453.

58 See, for example, *Geer*, 161 US at 534 ('[I]t 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'); *State v City of Bowling Green*, 313 NE2d 409, 411 (Ohio 1974) ('[W]here the state is deemed to be the trustee of property for the benefit of the public it has the obligation to bring suit . . . to protect the corpus of the trust property').

59 See Bogert (1987) § 99, p. 358; 76 Am Jur 2d Trusts § 404 ('One of the fundamental common-law duties of a trustee is to preserve and maintain trust assets. A trustee has the right and duty to safeguard, preserve, or protect the trust assets and the safety of the principal').

60 Wood (2009b), at notes 30–32.

The trustee's duty to protect the asset involves a corollary, active duty of vigilance to 'prevent decay or waste' to the asset.⁶¹ The waste doctrine is a staple of property law and a jealous guardian of future interests. As one treatise describes the waste doctrine, it prohibits consumption of 'things belonging to the inheritance'.⁶² Courts have readily granted injunctions against waste. As a leading old treatise on equity explains, courts enjoin waste to prevent 'great and irremediable mischief, which damages could not compensate, because the mischief reaches to the very substance and value of the estate, and goes to the destruction of it in the character in which it is enjoyed'.⁶³ A century and a half later, this description perfectly describes the effect of carbon pollution on the planet's atmosphere.

The duty against depleting the assets in a perpetual public trust forms a natural limit on the interests that any private parties can claim. Many have described the 'usufructuary' nature of private interests held in public trust assets. The landmark case, *Arnold v Mundy*, characterized public trust assets as 'things in which a sort of transient usufructuary possession, only, can be had'.⁶⁴ As Professor Karl Coplan explains:

[T]he holder of usufructuary rights can only exploit the fruits of the property, and must not under any circumstances impair the productivity of the underlying asset The interest is analogous to the interest of an income beneficiary of a conventional trust: the trustee may pay out the 'profits' of the trust, but must not invade the corpus.⁶⁵

By prohibiting use of the asset in a manner that would invade the trust inheritance and thereby diminish the wealth available to future beneficiaries, the public trust doctrine, along with its companion waste prohibition, is well appointed to protect against generational theft.⁶⁶ Courts can readily apply these duties to government trustees of the public's enduring natural trust.⁶⁷ As the Hawaiian Supreme Court emphasized in a leading public trust case involving water resources: 'The check and balance of judicial review provides a level of protection against improvident

61 *Moore v Philips* 627 P.2d 831; Bogert, *supra* n. 59, § 99, at 358; 76 Am. Jur. 2d Trusts, *supra* n. 59, §§ 331, 404 (a trustee 'must not suffer the estate to waste or diminish, or fall out of repair').

62 See, for example, *Hill v Ground*, 114 Mo App 80, 343, 89 SW 343, 344 (Ct App Mo 1905).

63 Willard (1863), p. 382.

64 *Arnold v Mundy*, 6 NJ 1, 49 (1821); see discussion at Coplan (2010), p. 325.

65 Coplan (2010), p. 325; see also Coplan (2010), p. 324: '[T]he sovereign, as trustee, may distribute the income of public trust assets, but may not sell off the corpus'.

66 If a trustee of a term for years threatens to commit waste, the remainderman can maintain a suit to enjoin him. Restatement 2d of Trusts, § 200.

67 For an example enforcing the waste prohibition against the federal government in the context of Indian law, see *United States v White Mountain Apache Tribe*, 537 US 465, 475 (2003).

disposition of an irreplaceable res'.⁶⁸ The doctrine provides perhaps the only precise legal expression of an intergenerational equity principle. Because future generations do not vote, their interests are often trumped by the interests of the present generation, which holds the political clout. As Professor Coplan points out, in the case of perpetual trusts such as the public trust, '[t]rustees must routinely preserve trust assets for future beneficiaries even against the demands of current beneficiaries'.⁶⁹ In essence, the trust serves as a judicially imposed restraint to the powerful political inclination of government officials to over-indulge the living generation of citizens and at the expense of future citizens.

The Atmospheric Trust

While traditionally applied to water-based resources, the public trust doctrine has expanded its reach over time,⁷⁰ and commentators increasingly point out the logic of a trust approach to climate crisis.⁷¹ In defining the scope of the trust endowment, courts have looked to the needs of the public as the primary guiding factor. As Professor Charles Wilkinson explains, 'The public trust doctrine is rooted in the precept that some resources are so central to the well-being of the community that they must be protected by distinctive, judge-made principles'.⁷² At the time of the *Illinois Central* case, lakebeds served a vital function in supporting fishing, navigation and commerce. Describing the lakebed as property in which 'the whole people are interested', the Court reasoned: 'The trust with which they are held, therefore, is governmental ... follow[ing] necessarily from the *public character of the property*'.⁷³

68 *Waihole Ditch*, 9 P3d at 455. 'Res' refers to the assets in the trust.

69 Coplan (2010), p. 328; see also Bogert (1987), at § 404: 'A trustee representing beneficiaries in succession is under a duty to successive beneficiaries to act with due regard to their respective interests and to preserve trust property for remainderpersons'.

70 See, generally, *Marks v Whitney*, 491 P2d 374, 380 (1971) ('In administering the trust the state is not burdened with an outmoded classification favoring one mode of utilization over another.');

71 See Torres (2002), p. 533: 'Properly understood ... the traditional rationale for the public trust doctrine provides a necessary legal cornerstone ... to protect the public interest in the sky'; Barnes (2006); Sax (1970), pp. 556–7 (urging application of doctrine to 'controversies involving air pollution'); Wood (2007), pp. 317–22: 'As technology, and the potential for cap-and-trade, makes aspects of the atmosphere subject to private ownership, the public trust doctrine should similarly evolve to include these interests in the public trust responsibilities of the sovereign'; Parenteau (2010).

72 Wilkinson (1980), p. 315.

73 *Illinois Central*, 146 US at 452–6 (emphasis added); see also *n.* 69 at 455 ('It would not be listened to that the control and management of the harbor of that great city – a subject of concern to the whole people of the state – should thus be placed elsewhere than in the state itself...') (emphasis added).

As a legal doctrine, the public trust compels protection of those ecological assets necessary for public survival and community welfare. Courts have recognized an increasing variety of assets held in public trust on the rationale that such assets are necessary to meet society's changing needs. As the New Jersey Supreme Court said, '[W]e perceive the public trust doctrine not to be 'fixed or static', but one to be 'molded and extended to meet changing conditions and needs of the public it was created to benefit'.'⁷⁴ Over time, the doctrine has reached new geographic areas, including water, ground water, wetlands, dry sand beaches, and non-navigable waterways.⁷⁵ In many states, it has pushed beyond the original societal interests of fishing, navigation and commerce to protect modern concerns such as biodiversity, wildlife habitat, aesthetics, and recreation.⁷⁶

The essential doctrinal purpose expressed by courts in these public trust cases compels recognition of the atmosphere as one of the crucial assets of the public trust. The public interests at stake in climate crisis are incalculably more extensive and profound than the traditional fishing, navigation and commerce interests at the forefront of *Illinois Central*. Atmospheric health is essential to all civilizations and to human survival across the globe. As one climate analyst put it, carbon reduction is necessary for averting 'the end of life as we know it'.⁷⁷ Given the essential nature of air, it is unsurprising that numerous state constitutions and codes recognize air as part of the *res* of the public trust.⁷⁸ Moreover, federal statutory law includes air as a trust asset for which the federal government, states, and tribes can gain recovery of natural resource damages.⁷⁹

74 See *Matthews v Bay Head Improvement Assoc*, 471 A2d 355, 365 (N J 1984) (citation omitted).

75 See, for example, *National Audubon Society v Superior Court of Alpine County*, 658 P2d 709, 719 (Cal 1983) (non-navigable tributaries); *Baxley v Alaska*, 958 P2d 422, 434 (Alaska 1998) (wildlife); *Matthews v Bay Head Improvement Ass'n*, 471 A2d 355, 358 (N J 1984) (dry sand area); *Robinson v Ariyoshi*, 658 P2d 287, 310 (Haw 1982) (groundwater); *Just v Marinette County*, 201 NW2d 761, 769 (Wis 1972) (wetlands).

76 *Matthews*, 471 A.2d at 363; *National Audubon*, 658 P.2d at 719–22.

77 See Romm (2008a).

78 See, for example, *Her Majesty v City of Detroit*, 874 F2d 332, 337 (6th Cir 1989) (citing Michigan Act that codifies public trust to include 'air, water, and other natural resources'); Haw Const, art. XI, §1 (stating, 'All public natural resources are held in trust by the State for the benefit of the people', and 'the State and its political subdivisions shall conserve and protect Hawaii's ... natural resources, including land, water, air, minerals and energy resources ...'); LA Const, art. IX, §1 ('natural resources of the state, including air and water ... shall be protected...'); RI Const, art. I, §16 (duty of legislature to protect air), interpreted as codification of Rhode Island's public trust doctrine in *State ex. Rel. Town of Westerly v Bradley*, 877 A2d 601, 606 (RI 2005); *National Audubon Society v Superior Court of Alpine County*, 658 P2d 709, 720 (1983) ('purity of the air' protected by the public trust).

79 CERCLA, 42 U.S.C. § 9601 (2006) (defining air as among the natural resources subject to trust claims for damages).

The Roman origins of the public trust doctrine classified air – along with water, wildlife and the sea – as ‘*res communes*’.⁸⁰ In a public trust decision, *Geer v Connecticut*, the United States Supreme Court relied on this ancient Roman classification of ‘*res communes*’ to find the public trust doctrine applicable to wildlife.⁸¹ Just a few years later, the Court explicitly recognized the states’ sovereign property interests in air and found such interests supreme to private title. In *Georgia v Tennessee*, the Court upheld an action brought by the state of Georgia against Tennessee copper companies for discharging noxious gases that drifted across state lines. The court declared: ‘[T]he state has an interest independent of and behind the titles of its citizens, in all the earth and air within its domain’.⁸² Though the Court did not use the word ‘trust’, the decision essentially proclaimed air as the people’s sovereign property.

In an article urging recognition of the atmosphere as a trust asset, Professor Coplan emphasizes the Roman roots of the public trust doctrine and Justinian’s explicit coverage of air as ‘*res communes*’.⁸³ He points out that courts have extended the public trust doctrine to resources that previously seemed incapable of private ownership (like water and wildlife) as they became threatened with private exploitation⁸⁴ and notes that the same should be true of air: ‘[A]s governments seek to privatize rights to atmospheric assets through tradable emissions rights, the public trust doctrine should naturally extend to protect previously unpossessable interests in the atmospheric commons’.⁸⁵

As yet, there is no precedent declaring these principles in the context of the atmosphere – certainly not surprising, as never prior to the modern industrialized era has humanity threatened the planet’s entire climate system. These are new circumstances for courts and for society in general, and lawyers seeking exact precedent will be searching in vain. This is a time in human history when lawyers worldwide must draw upon timeless principles and extrapolate them in logical fashion to new circumstances. Throughout history, courts have found themselves in the position of declaring new law in response to unforeseen, often urgent, circumstances. The same principles that have informed all of the historic public trust cases apply with even greater force to the atmosphere. As the Supreme

80 See *Geer v Connecticut*, 161 US at 525 (‘These things are those which the juris consults called ‘*res communes*’ – the air, the water which runs in the rivers, the sea and its shores ... [and] wild animals.’). See also Torres (2002), pp. 529–30 (discussing *res communes*).

81 See *Geer v Connecticut*, 161 US at 523.

82 *State of Georgia v Tennessee Copper Co*, 206 US 230, 237 (1907). The passage was cited in *Massachusetts v US Environmental Protection Agency*, 127 S Ct 1438, 1454 (2007).

83 See Coplan (2010).

84 Coplan (2010), p. 320: ‘Once the *res communes* became susceptible to private ownership, but as yet unappropriated ..., the potential limitations on private ownership under the public trust doctrine became relevant...’.

85 Coplan (2010), p. 320.

Court said in applying the public trust to an unprecedented set of circumstances in *Illinois Central*, ‘We cannot, it is true, cite any authority where a grant of this kind has been held invalid, for we believe that no instance exists where the harbor of a great city and its commerce have been allowed to pass into the control of any private corporation. But the decisions are numerous which declare that such property is held by the state, by virtue of its sovereignty, in trust for the public’.⁸⁶ Though conditions change with time, the basic task and the principles that guide courts remain constant. While air has not yet been the subject of trust litigation, modern courts have a solid legal rationale from which to draw in designating the atmosphere as a public trust asset.

The Public Trust Doctrine in Legal Systems Around the World

Government’s obligation to protect natural resources for present and future generations is said to exist ‘from the inception of humankind’.⁸⁷ This principle, declared forcefully by the Philippines Supreme Court in its landmark opinion, *Oposa v Factoran*, reflects a shared human understanding that ecological heritage, which is essential to human survival, is inviolate. Indeed, humankind’s innate interest in survival and self-perpetuation suggests a doctrinal foundation of the trust redolent of natural law.⁸⁸ Notably, the petitioners in *Oposa* – children and their parents – characterized their right to self-preservation and perpetuation as ‘the highest law of humankind – the natural law’. An early public trust case in the United States, *Arnold v Mundy*, also referred to the ‘law of nature, which is the only true foundation of all the social rights’ as a basis of the doctrine.⁸⁹ The United States Supreme Court in *Illinois Central* similarly declared: ‘A state legislature cannot, consistently with the principles of the law of nature and the constitution of a well-ordered society, make a direct and absolute grant of the waters of the state, divesting all the citizens of their common right’.⁹⁰

86 *Illinois Central RR v Illinois*, 146 US 387, 455 (1892).

87 *Juan Antonio Oposa v Fulgencio S Factoran, Jr*, GR 101083 (Sup Ct Phil 1993), as excerpted in Laitos et al. (2006), pp. 441–4.

88 For discussion of a natural law basis for the public trust, see generally Smith and Sweeney (2006); Yannacone (1975), pp. 615–53.

89 *Arnold v Mundy*, 6 NJL 1, 11 (NJ 1821).

90 *Illinois Central*, 146 US 387, 456 (1892). The same premise, deriving from natural law, found expression by the Supreme Court of Canada in a 2004 case, *British Columbia v Canadian Forest Products*, 2004 SCC 38. There, the court found the doctrine solidly a part of English common law as summarized in an influential treatise by H. de Bracton. As De Bracton described the doctrine, ‘By natural law these things are common to all: running water, air, the sea and the shores of the sea ...’, para. 75 (citing Bracton on the Laws and Customs of England 39–40 (1968)). As the Supreme Court summarized, the Crown is ‘holder of inalienable “public rights” in the environment and certain common resources ...’, at para. 76.

The natural law underpinnings of the public trust trace back to its early articulation in Ancient Rome's *Institutes of Justinian*,⁹¹ a document that informs many legal systems in the world. Compiled in 535 AD, the *Institutes of Justinian* ascribed the trust origins to natural law, 'the law which natural reason appoints for all mankind [that] obtains equally among all nations, because all nations make use of it'.⁹² The *Institutes* declared: 'By the law of nature these things are common to mankind – the air, running water, the sea, and consequently the shores of the sea'.⁹³ This principle, both in its force and potential, manifests across varied legal systems. Professor Charles Wilkinson has observed the doctrine in the ancient societies of Europe, East Asia, Africa, as well as in Muslim Countries and Native American cultures.⁹⁴ He notes, '[t]he real headwaters of the public trust doctrine ... arise in rivulets from all reaches of the basin that holds the societies of the world'.⁹⁵

The core principles of the public trust doctrine represent a crucial dimension of the sovereign politic. Fundamental to democracy, they are germane to any nation governed by the people. As Professor Coplan aptly describes, 'Public trust principles have been described as an essential attribute of sovereignty across cultures and across millennia'.⁹⁶ The public trust doctrine has developed extensively through common law in nations such as the United States and India, as well as in some combined civil/common law nations such as South Africa, and in some civil law nations as well.⁹⁷ Indeed, the public trust falls easily into a famous description offered by Justice Story in his leading treatise on equity. Explaining common underpinnings of far-flung and various legal systems, Justice Story commented:

[T]here are in nature certain fountains of justice whence all civil laws are derived, but as streams; yet, that, like as waters do take tinctures and tastes from the very soils, through which they run; so do civil laws vary according to the

91 Kennedy (2005), pp. 20–21 (noting that the Ancient Roman Code of Justinian 'guaranteed to all citizens the use of the "public trust", or commons – those shared resources that cannot be reduced to private property, including the air, flowing water, public lands, wandering animals, fisheries, wetlands, and aquifers').

92 Justinian, *Institutes*, 1.2.1, 2.1.1 (T. Sandars trans. 1st Am. ed n. 1876).

93 Justinian, *Institutes*, 1.2.1, 2.1.1 (T. Sandars trans. 1st Am. ed n. 1876).

94 Wilkinson (1989), pp. 429–31.

95 Wilkinson (1989), p. 431.

96 Coplan (2010), p. 311.

97 See Takacs (2008), p. 713: 'In the peripatetic manner that has come to characterize it, the Public Trust Doctrine migrated with the *Corpus Juris Civilis* throughout Europe, to both civil law and common law regimes'; Takacs (2008), pp. 740–48 (describing South Africa regime); see also Ankersen (2003), p. 813, n. 27 (describing civil law analog to public trust doctrine in Latin America); Gleason and Johnson (1995), p. 76: 'The public trust doctrine, having roots in ancient Roman law, appears in many legal systems'.

regions or governments, where they are planted, though they proceed from the same fountains.⁹⁸

The common thread in all public trust iterations is a public property right and corollary sovereign obligation. In all nations, a sovereign property interest emerges from government's control over a particular territory. Where the sovereign derives its power from the people (as distinguished from a totalitarian government or despotic monarchy), this governmental property interest is necessarily that of a trust, held in fiduciary capacity on behalf of the people. It may not explicitly be called a 'trust' in all countries, but the sovereign character of ownership is such that the trust construct serves as a useful analogue even in nations that lack the nomenclature developed in common law. A sovereign trust distinguishes a democracy serving at the will of the public from a government that effectuates the interests of an oligarchy at the expense of the citizens. As Justice Finn of Australia observes: 'Sovereignty and trust probably are best seen as expressions of intrinsic qualities of our democracy. In this, they properly can be described as 'constitutional principles''.⁹⁹ In the same vein, Professor Karl Coplan notes that the public trust of the United States is 'equally enforceable as part of the social contract underlying the constitutional bargains of federalism and popular sovereignty Public trust limits inhere in sovereignty, and these limits are reserved to the people'.¹⁰⁰

The *Oposa* opinion from the Philippines Supreme Court illuminates the natural law force of the trust doctrine in a country beset with environmental turmoil. In *Oposa*, the Court faced a lawsuit brought by children and their parents to prevent the federal government from allowing private logging corporations to cut down the last remaining old-growth forest in the country. Invoking the trust to enjoin any further logging, the Court rendered a sterling pronouncement that, indeed, finds resonance through nearly all political systems:

Needless to say, every generation has a responsibility to the next to preserve that rhythm and harmony for the full enjoyment of a balanced and healthful ecology [T]he right to a balanced ecology ... belongs to a different category of rights [than civil and political rights] altogether for it concerns nothing less than self-preservation and self-perpetuation ... the advancement of which may even be said to predate all governments and constitutions.

As a matter of fact, these basic rights need not even be written in the Constitution for they are assumed to exist from the inception of humankind. If they are now explicitly mentioned ... it is because of the well-founded fear of its framers that unless the right to a balanced and healthful ecology and to health are mandated as state policies by the Constitution itself ... the day would not be too far when

98 Story (1866), p. 732 (paraphrasing Lord Bacon).

99 Finn (1995).

100 Coplan (2010), p. 311.

all else would be lost not only for the present generation, but also for those to come – generations which stand to inherit nothing but parched earth incapable of sustaining life.¹⁰¹

The public trust doctrine is particularly vibrant in India, no doubt one of the most crucial players in the climate context because of its enormous current pollution and future development aspirations that are tied to fossil fuels.¹⁰² In India, the Supreme Court extended the right to life found in the Constitution to include the right to a healthy environment,¹⁰³ and declared the public trust as part of the law of the land.¹⁰⁴ The Court first applied public trust principles with regard to the protection and preservation of natural resources in *M. C. Mehta v Kamal Nath and Others*, finding that the state government had violated the trust in granting a lease on riparian forestland.¹⁰⁵ The Court has invoked the public trust in several other cases as well, ranging across varied contexts.¹⁰⁶ Indian public trust jurisprudence relies heavily on cases and scholarship from the United States.¹⁰⁷ In a 2010 case, the Court noted that government's power is 'vested in trust by the people'¹⁰⁸ and warned of institutional degeneration in natural resources policy: '[T]he problems arise because exploitation of those resources occurs without appropriate supervision by the State as to the rates of exploitation, equitable distribution of the

101 *Juan Antonio Oposa v Fulgencio S Factoran, Jr*, GR No 101083 (Sup Ct Phil 1993), as excerpted in Laitos et al. (2006), pp. 443–4.

102 Watts (2010).

103 The Constitution of India was amended in 1976 to expressly address environmental quality. Part IVA, art. 51A, cl. (g) requires every citizen of India 'to protect and improve the natural environment including forests, lakes, rivers and wild life, and to have compassion for living creatures'; and Part IV, art. 48A, entitled *Protection and improvement of environment and safeguarding of forests and wild life*, states: 'The State shall endeavour to protect and improve the environment and to safeguard the forests and wild life of the country'. Article 21 of the Constitution of India states that '[n]o person shall be deprived of his life or personal liberty except according to procedure established by law', Const. of India Part III, art. 21.

104 *M. C. Mehta v Kamal Nath and Others*, ¶ 34 (1997 1 SCC 388), WP 182/1996 (2000.05.12).

105 See n. 104.

106 See *Th. Majra Singh v Indian Oil Corporation* AIR 1999 J&K 81; *M. Builders Pv. Ltd v Radhey Shyam Sahu and Others*, 1999 6 SC 464, AIR 1999 SC 2468; *Karnataka Industrial Areas Development Board v C Kenchappa*, AIRSCW 2546 (India 2006); see also Razzaque (2001), p. 231.

107 See, for example, *Fomento Resorts and Hotels Ltd v Minguel Martins*, Civil Appeal Nos 4154, para. 32, 35 (S Ct India 2000), available at <http://www.elaw.org/node/3731>; *Reliance Natural Resources Ltd v Reliance Industries Ltd*, Civil Appeal No. 4273 of 2010, slip op at 207, para. 97 (S Ct India 2010) (hereinafter, *Reliance Natural Resources*), available at: http://www.legallyindia.com/images/stories/docs/cases/RIL_v_RNRL_supreme_court.pdf.

108 *Reliance Natural Resources*, see n. 107, at 125, para. 5.

wealth it generates, collusions between the extractive industry and some agents of the State and the consequent evisceration of the moral authority of the institutions of the State'.¹⁰⁹ In 2000, in *Fomento Resorts v Minguel Martins*, the Court declared a sweeping reach of the public trust doctrine, clearly encompassing air:

[The public trust doctrine] primarily rests on the principle that certain resources like air, sea, waters and the forests have such a great importance to the people as a whole that it would be wholly unjustified to make them a subject of private ownership. These resources are gifts of nature, therefore, they should be freely available to everyone irrespective of one's status in life. The public trust doctrine enjoins upon the Government to protect the resources for the enjoyment of the general public rather than to permit their use for private ownership or commercial purposes. This doctrine ... mandates affirmative State action for effective management of natural resources and empowers the citizens to question ineffective management thereof. The heart of the public trust doctrine is that it imposes limits and obligations upon government agencies and their administrators on behalf of all the people and especially future generations.¹¹⁰

Throughout all of its public trust jurisprudence, the India Supreme Court has expressed an abiding concern for the future generations. In its 2010 *Reliance Natural Resources* case, the Court declared:

The concept of people as a nation does not include just the living; it includes those who are unborn and waiting to be instantiated. Conservation of resources, especially scarce ones, is both a matter of efficient use to alleviate the suffering of the living and also of ensuring that such use does not lead to diminishment of the prospects of their use by future generations.¹¹¹

In the *Fomento Resorts* case, the Court drew upon the work of Professor Joseph Sax to conclude:

[T]he Public Trust Doctrine, of all concepts known to law, constitutes the best practical and philosophical premise and legal tool for protecting public rights and for protecting and managing resources, ecological values or objects held in trust. The Public Trust Doctrine is a tool for exerting long-established public rights over short-term public rights and private gain. *Today, every person exercising his or her right to use the air, water, or land and associated natural*

109 *Reliance Natural Resources*, see n. 107, at 132 para. 12.

110 *Fomento Resorts*, see n. 107, at para. 32. In the *Reliance Natural Resources* case, the Court declared a public trust over natural gas reserves, noting: 'It is now a well established principle of jurisprudence that the true owners of "natural wealth and resources" are the people as a nation...'. *Reliance Natural Resources*, see n. 107, at 200, para. 88.

111 *Reliance Natural Resources*, see n. 107, at 205–06, para. 9.

*ecosystems has the obligation to secure for the rest of us the right to live or otherwise use that same resource or property for the long term and enjoyment by future generations.*¹¹²

These public trust cases provide hope that, even as India's political leaders refuse to commit to carbon reduction, the courts will recognize an atmospheric trust responsibility on the part of government.

In Canada, the public trust doctrine gained explicit recognition in a 2004 case, *British Columbia v Canadian Forest Products Limited*.¹¹³ There, the Canadian government sought damages against a private logging company for a fire that swept through public forests. Detailing the origins of the public trust doctrine, as well as its companion *parens patriae* doctrine (which allows the government to sue on behalf of the public), the Court recognized that they form an appropriate common law basis for recovering natural resource damages to a public resource.¹¹⁴ Finding declarations of public rights and ownership in 'running water, air, the sea and the shores of the sea' in both the *Institutes of Justinian* and H. de Bracton's influential treatise on English law, the Court stated: 'By legal convention, ownership of such public right was vested in the Crown, as too did authority to enforce public rights of use ...':

Since the time of de Bracton it has been the case that public rights and jurisdiction over these cannot be separated from the Crown. This notion of the Crown as holder of inalienable 'public rights' in the environment and certain common resources was accompanied by the procedural right of the Attorney General to sue for their protection representing the Crown as *parens patriae*. *This is an important jurisdiction that should not be attenuated by a narrow judicial construction.*

Citing favourably American law declaring a public trust, and noting that the public trust and *parens patriae* doctrines have supported successful United States common law claims for monetary natural resource damages in absence of statutes, the Court acknowledged that the trust raises important policy questions, including 'the Crown's potential liability for *inactivity* in the face of threats to the environment, [and] the existence or non-existence of enforceable fiduciary duties owed to the public by the Crown...'.¹¹⁵ Finding the case at hand 'not a proper appeal for the Court to embark on a consideration of these difficult issues', as the case in the lower court had been framed around the right of the Crown to make a claim as 'any other landowner' for loss of timber value, the Court deferred a detailed analysis of

112 *Fomento Resorts*, *supra* n 107, at par. 32 (emphasis added).

113 *British Columbia v Canadian Forest Products*, 2004 SCC 38, para. 64–83, available at <http://scc.lexum.umontreal.ca/en/2004/2004scc38/2004scc38.html>.

114 See n. 113 at para. 71–81.

115 See n. 113 at para. 79–81.

the public trust for another time. Clearly, however, the *Canadian Forest Products* case indicates receptivity to further trust litigation.

In Australia, a country that has common law roots, one would expect the public trust to be a pillar of environmental jurisprudence. Instead, however, the idea of government trust obligation is just beginning to crystallize. As Justice Finn writes in a book on the trust underpinnings of governance, Australia rapidly advanced from being a colony under the control of England to its modern administrative state, without a sufficient corresponding progression in legal doctrine to redefine the essential character of government.¹¹⁶ The nation seemingly skipped a chapter of political thinking that infused the American democracy (as he points out, 'the judges of the 17th and 18th centuries were unable to draw the treasonable conclusion that public power came directly from the people').¹¹⁷ He explains that 'the casualty in legal thought' from this progression was a failure of the legal system to drape government officers and agencies with fiduciary trust obligations as the servants of the people.¹¹⁸ But, while until recent times, trust ideals have had 'little resonance' in Australian political and legal thought, Justice Finn suggests that the fiduciary conception is inevitably part of the political embrace of popular sovereignty:

However we may wish to interpret [the] common law, we cannot now ignore the inexorable logic of popular sovereignty. If the powers of government belong to and are derived from the people, can the donees of those powers under our constitutional arrangements properly be characterized in terms other than that they are the trustees, the fiduciaries, of those powers for the people? Though separated by more than two centuries, our answer should be that of the American colonists after the Revolution. I would formulate it in this way: ... The institutions of government, the officers and agencies of government, exist for the people, to serve the interests of the people, and, as such, are accountable to the people Sovereignty and trust probably are best seen as expressions of intrinsic qualities of our democracy.¹¹⁹

While the public trust concept is embryonic in some countries, and a mature doctrinal force in others, the foundation of the public trust applies to the majority of nations whose citizenry celebrates and honours fundamental assumptions of democracy. Indeed, a growing chorus of legal voices notes the commonality of public trust principles among nations and urges their application to vexing and

116 Finn (1995), pp. 10–11.

117 Finn (1995), p. 10.

118 Finn (1995), pp. 11–12: '[L]egal principle all but surrendered its place as a force defining the nature and end of government itself'.

119 Finn (1995), p. 15.

unprecedented problems of global ecology.¹²⁰ Yet there is a persistent perception that the trust doctrine, whose most detailed elucidation is through common law, does not apply to ‘civil law’ countries. The assumption derives from an overly rigid view of legal expression and the common tendency of lawyers to overlook doctrine’s roots, which extend to the very bedrock of human civilization. It is true that civil law nations do not have any concept of private trusts.¹²¹ Unfortunately, this has often led lawyers in civil law countries to brush aside the public trust doctrine, presuming it not applicable to their systems. The public trust doctrine, however, speaks to sovereignty and public ownership, not to private trust arrangements. As international public trust scholar Peter Sand points out, the ‘functional equivalents of public trusteeship’ are evident in many civil law systems.¹²² For example, classic civil law countries such as Germany, France, Switzerland and the Scandinavian nations have laws declaring public ownership interests in waterways, shorelines, and/or wildlife.¹²³ Such laws reflect a quintessential understanding residing at the very core of the trust – a concept of public ownership that has maintained a steady pulse through time, still iterated in many civil law countries through discrete laws proclaiming public rights in natural resources.

While many scholars focus on the common law iterations of the public trust doctrine – understandably so, since courts have often been the pace-setters in both establishing environmental rights of citizens and announcing their fundamental trust basis – the trust concept is by no means confined to common law alone. A remarkably fluid precept, it manifests in countless and varied iterations, has manifold origins, and proliferates across the globe through multiple routes. The landmark United States case, *Arnold v Mundy*, ascribed the trust to an amalgamation of law, including the law of nature, civil law, and English common law.¹²⁴ By necessity, the doctrine has adapted and moulded to new sovereign circumstances as nations have changed their governing character. As Professors Goble and Freyfogle note in their extensive analysis of the doctrine’s transformation from England to the United States, ‘[T]he doctrine of royal prerogative ownership of submerged lands

120 See Nanda and Ris (1976), p. 306: (inventorying trust concepts in other countries, and concluding, ‘The principles of public trust are such that they can be understood and embraced by most countries of the world’); Sand (2004), pp. 57–8 (suggesting trust principles as framework for international law, stating, ‘[A] transfer of the public trust concept from the national to the global level is conceivable, feasible, and tolerable The essence of transnational environmental trusteeship ... is the democratic *accountability* of states for their management of trust resources in the interest of the beneficiaries – the world’s “peoples”’) (emphasis in original); Turnipseed et al. (2010).

121 Turnipseed et al. (2010), p. 12.

122 Turnipseed et al. (2010), p. 12.

123 Turnipseed et al. (2010), p. 12. For an analysis of the public trust concept in German law, see Kube (1997).

124 *Arnold v Mundy*, 6 NJL 1, 76–77 (1821). For an example of a modern case tracing the doctrine, see *1.58 Acres of Land*, 523 F Supp at 122 (‘Public trust theory has its roots in the Roman law’).

thus was *transformed in the transition from monarchy to republic* into the doctrine of state sovereign ownership in which the state held the lands as trustee for the real sovereign, the people'.¹²⁵ At times in various countries, the public trust doctrine has rested in dormancy, only to be resurrected to fit new circumstances. As David Takacs describes the doctrine's progression in South Africa,

[I]n the same year that India's Supreme Court mandated its Public Trust Doctrine, the South African government disinterred its own moribund Public Trust Doctrine, which had been buried through decades of apartheid regimes whose leaders felt no need to act to preserve resources for the majority of the public.¹²⁶

South Africa now has one of the leading iterations of the doctrine worldwide.

Through the course of human civilization, this remarkable doctrine has come to life through the efforts of lawyers, judges, citizens, and legislators – all of whom recognize its arresting potential and universal force in compelling governmental obedience to a timeless moral covenant with both present and future generations of citizens.¹²⁷ At many times in jurisprudential history, the doctrine has emerged from historic precedent to address, often urgently, a diminishing endowment of natural resources that are crucial for public welfare. Climate emergency portends unparalleled resource scarcity – it forces a leap beyond applicable experience. As award-winning journalist, Ross Gelbspan, has written, 'There is no body of expertise – no authoritative answers – for this one. We are crossing a threshold into uncharted territory'.¹²⁸ As explained earlier, lawyers and judges worldwide must respond boldly and creatively, drawing upon fundamental legal concepts such as the public trust doctrine to logically address circumstances that elude conventional legal approaches.

Today's lawyers in civil law countries certainly have the means to unearth the public trust doctrine from their own jurisprudential history and mould it to their modern legal architecture. In doing so, they may use existing environmental statutes as legal hooks for atmospheric trust lawsuits seeking to protect the Earth's climate. Nearly all countries have laws requiring protection of the environment, and 117 nations have constitutions that express environmental obligations and/or

125 Goble and Freyfogle (2002).

126 Takacs (2008), p. 743.

127 *Alliance to Protect Nantucket Sound Inc v Energy Facilities Siting Board*, 457 Mass. 663, 702 (Mass SCt 2010), available at <http://www.massreports.com/SlipOps/Default.aspx> (case involving tidelands) (Marshall, CJ, concurring and dissenting) ('The public trust doctrine stands as a covenant between the people of the Commonwealth and their government, a covenant to safeguard our tidelands for all generations for the use of the people...').

128 Gelbspan (2007).

ecological rights held by the people.¹²⁹ In fact, many nations have constitutional provisions that codify the trust precept.¹³⁰ Such statutory or constitutional provisions can fasten an atmospheric trust lawsuit to the existing legal structure of the nation. Where existing laws affirm public rights in water resources or public beach access but are silent as to air, lawyers can describe these water and coastal resources as proxies for climate crisis, explaining that hotter planetary temperatures and rising atmospheric concentrations of carbon dioxide will cause droughts, water

129 Takacs (2008), at n 78. As the district court noted in *1.58 Acres of Land*, the public ownership roots of the doctrine are evident with respect to submerged lands in many countries. See *1.58 Acres of Land*, 523 F Supp at 123 ('Historically, no developed western civilization has recognized absolute rights of private ownership in such land as a means of allocating this scarce and precious resource among the competing public demands').

130 South Africa, for example, ratified a constitution in 1996 that declares, in Section 24: 'Everyone has the right: a) to an environment that is not harmful to their health or well-being; and b) to have the environment protected, *for the benefit of present and future generations*, through reasonable legislative and other measures that: i) prevent pollution and ecological degradation; ii) promote conservation; and iii) secure ecologically sustainable development ...' South African Constitution 1996 section 24 (emphasis added), cited in Takacs (2008), n. 154 and accompanying text. Kenya's Constitution, revised in 2010, declares the right of every person 'to a clean and healthy environment, which includes the right (a) to have the environment protected for the benefit of present and future generations through legislative and other measures ...'. Kenya Constitution. Art. 42, available at <http://www.nation.co.ke/blob/view/-/913208/data/157983/-/18do0kz/-/published+draft.pdf>. Kenya's High Court has upheld public trust principles in environmental cases, comparing the right to a healthy environment to the right to life. *Waweru v. Republic*, Misc. Civil Application No. 118 of 2004, at 689 (High Court, at Nairobi, 2 March, 2006) ('Living ... takes place in some environment and therefore the denial of wholesome environment is a deprivation of life.' And '[i]n the case of land resources, forests, wetlands and waterways to give some examples the Government and its agencies are under a public trust to manage them in a way that maintains a proper balance between the economic benefits of development with the needs of a clean environment.'). available at <http://www.chr.up.ac.za/index.php/browse-by-subject/339-kenya-waweru-v-republic-2007-ahrlr-149-kehc-2006-.html>. In Ecuador, a Constitutional referendum adopted in 2008 gave inalienable rights of Nature to exist and persist and regenerate. See Koons (2008). In April, 2011, Bolivia was poised to pass a similar set of laws, known as the Law of Mother Earth. See Vidal (2011). Section 13 of the Ukraine Constitution makes explicit reference to public ownership of atmosphere:

The land, its mineral wealth, *atmosphere*, water and other natural resources within the territory of Ukraine, the natural resources of its continental shelf, and the exclusive (maritime) economic zone, are objects of the right of property of the Ukrainian people. Ownership rights on behalf of the Ukrainian people are exercised by bodies of state power and bodies of local self-government within the limits determined by this Constitution. Every citizen has the right to utilize the natural objects of the people's right of property in accordance with the law. Property entails responsibility. Property shall not be used to the detriment of the person and society. The State ensures the protection of the rights of all subjects of the right of property and economic management, and the social orientation of the economy. Const. of Ukraine, art. 13.

scarcity, disruption of natural hydrological cycles, rising tides, coastal flooding, and ocean acidification. Through briefs and other writings, lawyers may infuse the statutory and constitutional provisions at their disposal with trust principles and contextualize them in the deep understandings of popular sovereignty that arouse both citizens and judges.¹³¹ Lawyers can urge judges to graft trust principles onto existing statutory or constitutional provisions, or to anchor their interpretation of such provisions to underlying trust concepts.

In this manner, lawyers worldwide can unite in their capacity to declare sovereign ecological obligations and public ownership of crucial planetary assets. In countries across the globe, lawyers may launch hundreds of different legal actions – some based on statutory law, some on common law, some on Constitutional law, some on customary or religious law, some on natural law – to express the trust obligation on the part of all governments to protect conditions necessary to sustain life on Earth for both present and future generations. Only by characterizing the atmosphere in its planetary entirety will Humanity arrive at an adequate regime of carbon reduction. Without such a singular focus that encompasses all nations of the world in joint and collective sovereign responsibility, the climate movement is at risk of degenerating into fractured and diffused efforts set adrift from any core, unifying principle. The public trust doctrine, by presenting a fundamental basis transcending national and cultural differences, provides the most promising framework by which citizens of different nations can establish carbon reduction responsibility against their own governments as part of a unified global approach. Indeed, the UNFCCC, negotiated in 1992 and signed by most nations of the world, provides an umbrella legal framework for applying the public trust concept to climate change by calling upon nations to ‘protect the climate system for the benefit of present and future generations of humankind’.¹³²

The Public Trust and Shared Assets: A Sovereign Co-Tenancy

One of the great strengths of the trust doctrine in addressing climate crisis is that it draws upon a property framework that creates logical rights to shared assets of a trans-boundary nature. It is well established that, with respect to trans-boundary trust assets, all sovereigns with jurisdiction over the natural territory of the asset have legitimate property claims to the resource.¹³³ Property law arranges these

131 Indeed, in some nations like India, the Philippines, and South Africa, where the public trust is law of the land, it is inextricably woven into constitutional declarations. See generally Takacs (2008) (discussing India and South Africa).

132 UNFCCC, S. Treaty Doc. No. 102–38, Art. 3, p. 1 (1992), available at <http://unfccc.int/resource/docs/convkp/conveng.pdf>.

133 States that share a waterway, for example, have correlative rights to the water. *Arizona v California*, 373 US 546, 601 (1963). Similarly, states and tribes have co-existing property rights to share in the harvest of fish passing through their borders. *Washington v Washington State Commercial Passenger Fishing Vessel Ass’n*, 443 US.658, 676–79

interests into a co-tenancy. A co-tenancy is 'the ownership of property by two or more persons in such manner that they have an undivided ... right to possession'.¹³⁴

Courts have used the co-tenancy model on the sovereign level to describe shared interests to migrating salmon. In Indian treaty litigation in the United States, the Ninth Circuit declared that the tribes and the states have 'something analogous to a co-tenancy in the off-reservation fishery', finding that each sovereign class had an 'equality of right' under the treaties to the migrating fish: '[T]he state and the tribes stand in similar positions as holders of quasi-sovereign rights in the fishery, and ... the federal courts are, when necessary, arbiters of those rights'.¹³⁵

A bedrock principle in any co-tenancy is the correlative duty not to 'waste' the common asset. Acts that amount to permanent damage to the common property are held to constitute waste.¹³⁶ This parallels the waste prohibition that applies to trustees of property, as described earlier. As the Ninth Circuit described the duty in the treaty fishing cases:

Co-tenants stand in a fiduciary relationship one to the other. Each has the right to full enjoyment of the property, but must use it as a reasonable property owner. A cotenant is liable for waste if he destroys the property or abuses it so as to permanently impair its value. A court will enjoin the commission of waste ...

(1979). See also *Idaho ex rel Evans v Oregon*, 462 US 1017, 1031 n1 (1983) (O'Connor, J., dissenting) (noting 'recognition by the international community that each sovereign whose territory temporarily shelters [migratory] wildlife has a legitimate and protectable interest in that wildlife').

134 Black's Law Dictionary 1477 (8th edn 2004); Singer (1994); see also 20 Am. Jur. 2d Co-tenancy and Joint Ownership § 1 (1995).

135 *Puget Sound Gillnetters Ass'n v U S Dist Court*, 573 F 2d 1123, 1128 (9th Cir 1978) (holding that the treaty established 'something analogous to a co-tenancy, with the tribes as one co-tenant and all citizens of the Territory (and later of the state) as the other'); *United States v Washington*, 520 F2d 685, 686, 690 (9th Cir 1975) (applying co-tenancy construct, by analogy, to Indian fishing rights). The court recognized that, as applied to a fishery on the sovereign level, not all of the 'rights and incidents of a common law co-tenancy necessarily follow' as they would in the case of a co-tenancy in land. *Puget Sound*, 573 F2d at 1128, n. 3. But the court nevertheless found the analogy helpful and used it to guide its allocation of the migratory fishery. While the Indian fishing cases drew upon treaty language (reserving tribal fishing rights 'in common' with the states) to find a co-tenancy, the concept is equally applicable to non-treaty situations in which different sovereigns share assets of transitory or migratory character. In the Indian fishing cases, the treaties were crucial for establishing that the tribes held *any* property interest in the fishery, as the states had become governing sovereigns with territorial jurisdiction. In the case of national sovereigns (as oppose to domestic native nations), this property interest springs automatically from the assertion of exclusive sovereignty over a particular territory.

136 Hopkins (1896), p. 342; Walsh (1947), § 131, at 72.

By analogy, neither the treaty Indians nor the state on behalf of its citizens may permit the subject matter of these treaties to be destroyed.¹³⁷

These principles are readily extrapolated to the atmosphere, a natural asset that (like a migratory fishery) transcends sovereign borders. Within a sovereign property framework, all nations on Earth are co-tenant trustees of the global atmosphere.¹³⁸ This conception is reinforced by the UNFCCC, which essentially declares a commonly held atmospheric trust obligation.¹³⁹ From this property framework, two separate duties arise. First is the sovereign duty that each government, as trustee, has towards its own citizens to protect the atmospheric asset and prohibit waste of their natural inheritance. Second is the duty owed by each nation towards all other nations, arising from the sovereign co-tenancy relationship, to prevent waste to their common asset, the atmosphere. The two duties merge into a uniform obligation, incumbent on all governments, to reduce atmospheric emissions.

Atmospheric Trust Litigation

By characterizing the atmosphere in its entirety as a defined trust asset, ATL is designed as a macro-level legal strategy to enforce scientifically based prescriptions for carbon reduction.¹⁴⁰ It seeks to impose concrete, quantitative carbon reduction requirements on governments worldwide. As co-trustees of the world's atmosphere, all sovereign nations are bound by the fiduciary obligation to ensure overall health of the asset. The various agencies and sub-jurisdictions of government, as agents of the trustees, are similarly bound. Fiduciary standards are defined by objective, not political, criteria. Scientific prescriptions for achieving climate equilibrium form the yardstick for the atmospheric fiduciary obligation. The judicial role is to compel the political branches to meet their fiduciary obligation through whatever measures and policies they choose, as long as such measures sufficiently reduce carbon emissions within the required time frame. The courts' role is not to supplant a judge's wisdom for a legislature's approach, but

137 See *Washington*, 520 F2d at 685.

138 For the concept of a 'planetary trust', see Weiss (1984); Finn (1995).

139 See UNFCCC, n. 132.

140 See Torres (2002), p. 532: 'The public trust doctrine supplies a broad framework that supports the establishment of a mechanism ... to supervise the government dealings in relationship to the carrying capacity of the atmosphere'. It should be noted, however, that a carbon prescription standing alone, even if faithful to the best science, will likely not solve the global warming crisis. It is evident that society must deploy multiple strategies to arrive at carbon reduction. Nevertheless, many strategies will likely fail absent a clear framework of legal responsibility that forces carbon reduction. A carbon prescription mandating regular cuts on a path to a near-zero-carbon endpoint forces a transition that would otherwise fail due to inertia and political impasse.

rather to police the other branches to ensure fulfilment of their trust responsibility in accordance with the climate imperatives of nature.¹⁴¹ By linking to scientific prescriptions as the measure of fiduciary responsibility, the ATL approach is aimed at divesting the world's leaders of their assumed prerogative to take action only according to their political objectives.

Carbon Math and Orphan Shares

A core task in defining the sovereign fiduciary obligation is determining how much carbon reduction must occur, and within what time-frame, in order to achieve climate equilibrium over the long term. There are several steps to arriving at a carbon reduction trajectory that would meet the fiduciary obligation to protect the atmosphere. To begin with, climate goals are often expressed in terms of limits on planetary heating, and this is the logical starting point for determining the atmospheric trust obligation. Some amount of heating is already beyond humanity's control as a result of past carbon releases to the atmosphere.¹⁴² This heating is 'in the pipeline' and cannot be called back by humanity unless technology is developed that will draw down carbon, a prospect that remains unlikely. As the National Oceanic and Atmospheric Administration explains: '[T]he climate change that takes place due to increases in carbon dioxide concentration is largely irreversible for 1,000 years after emissions stop'.¹⁴³

Leading climate scientists warn that, if the Earth heats beyond 2 °C, the planet will pass irrevocable thresholds, rendering much of life on Earth impossible.¹⁴⁴ Even with 2 °C heating, scientists predict significant risk of intolerable impacts, such as the Greenland icecap melting and a consequential rise in sea level that would displace millions of people worldwide.¹⁴⁵ As Dr James Hansen explains: 'Global warming of 2 °C or more would make Earth as warm as it had been ... three million years ago [which] caused sea levels to be about twenty-five meters (eighty feet) higher than they are today'.¹⁴⁶ Many vulnerable island states and African nations reject any 2 °C target, as such an increase would obliterate or devastate their nations. A coalition of 112 nations now calls for a limit of 1.5 °C

141 See *Lake Michigan Federation v US Army Corps of Engineers*, 742 F Supp 441, 446 (N. D Ill 1990) ('The very purpose of the public trust doctrine is to police the legislature's disposition of public lands. If courts were to rubber stamp legislative decisions ... the doctrine would have no teeth. The legislature would have unfettered discretion to breach the public trust as long as it was able to articulate some gain to the public').

142 See Parenteau (2010), see n. 68 at (draft) 2–3 (citing reports and explaining unavoidable heating); see also Hansen (2008a).

143 Solomona et al (2009), p. 1704 cited in Parenteau (2010), p. 3.

144 McCarthy (2009).

145 Copenhagen Diagnosis (2009), p. 49.

146 Hansen (2009), p. 13.

heating.¹⁴⁷ By all normative principles of justice, the atmospheric restoration goal must be set at a level that maintains planetary fixtures and the climate system in support of humanity in all co-tenant nations, not just the industrialized nations. As a guiding principle that mirrors the atmospheric fiduciary obligation, the UNFCCC declared a universal responsibility to avoid 'dangerous anthropogenic heating' of the planet¹⁴⁸— which now appears to demand a limit of a 1.5 °C increase over pre-industrial temperatures.¹⁴⁹ Moreover, to the extent that uncertainty surrounds climate policy, the UNFCCC called for a precautionary approach, which should lead courts to err on the side of a more aggressive reduction trajectory.¹⁵⁰

The next step is to translate that heating limit (1.5 °C) into atmospheric concentrations of carbon dioxide. To limit heating at 1.5 °C, leading scientists maintain that the atmosphere's carbon dioxide concentration should reduce *below* 350 parts per million (ppm) over the long term.¹⁵¹ As Dr Hansen and his colleagues conclude:

If humanity wishes to preserve a planet similar to that on which civilization developed and to which life on Earth is adapted, paleoclimate evidence and ongoing climate change suggest that CO₂ will need to be reduced from its current 385 ppm to at most 350 ppm.¹⁵²

147 See *Countries for 150 ppm / 1.5 C.*, 350.org., available at http://www.350.org/sites/all/files/Countries_Endorsing_350_ppm.pdf; see also *UN Scientist Backs '350' Target for CO₂ Reduction*, Yahoo News (25 Aug. 2009). For the perspective of one island nation that risks total submersion from rising sea levels as a result of planetary heating, see President Nasheed, Maldives, Address by His Excellency President Nasheed at the High Level Conference on Climate Change: Technology Development and Transfer

New Delhi, India (October 22, 2009), available at <http://www.newdelhicctechconference.com/InauguralSession/Speech-PresidentofMaldives.pdf>.

148 UNFCCC, Art. 2.

149 As James Hansen (2008a) writes, ('[T]he safe level of atmospheric carbon dioxide is no more than 350 ppm (parts per million), and it may be less . . . [T]he oft-stated goal to keep global warming less than two degrees Celsius (3.6 degrees Fahrenheit) is a recipe for global disaster, not salvation'. Summarizing his climate research, he concludes, 'the safe level of atmospheric carbon dioxide is no more than 350 ppm (parts per million), and it may be less'.

150 See UNFCCC, Art. 3.3 ('The Parties should take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing such measures . . .').

151 Hansen et al. (2008); (2009) '*UN Scientist back '350'...*', p. 1; see also Rockström et al. (2009b), p. 32.

152 Hansen et al. (2008); (2009) '*UN Scientist back '350'...*', p. 1.

The global average CO₂ concentration – which now exceeds 390 *parts per million* – is the highest in 650,000 years of geologic history.¹⁵³ Currently, humanity is on a lock-step ‘Business As Usual’ (BAU) track that, if continued for several decades, is projected to heat the planet a disastrous 4–7 °C by 2100.¹⁵⁴ In the words of climate scientists, BAU will ‘loc[k] in climate change at a scale that would profoundly and adversely affect all of human civilization and all of the world’s major ecosystems’.¹⁵⁵

It is eminently clear that continued greenhouse gas pollution by any nation on Earth constitutes ‘waste’ to the common asset. Yet, the waste principle can only gain quantitative meaning when scientists translate the <350 ppm atmospheric restoration goal into a global prescription of carbon dioxide reduction. In 2007, the Union of Concerned Scientists produced a report, *How to Avoid Dangerous Climate Change: A Target for US Emissions Reductions*, that called for a four per cent annual reduction in greenhouse gas emissions in the industrialized world starting in 2010.¹⁵⁶ Though this target was structured as a scientific prescription that could be judicially adopted as a sovereign fiduciary obligation to restore the atmosphere, the report’s trajectory was calibrated to a goal of 450 ppm of atmospheric carbon dioxide concentration (and, even so, presented only a 50 per cent chance of limiting the temperature rise to 2 °C, a risk that would not satisfy any fiduciary standard, which incorporates a measure of prudence and caution in managing assets).¹⁵⁷ Just as the report issued, new data poured in showing the disintegration of the Arctic sea ice and the accelerated melting of Greenland’s massive ice sheet.¹⁵⁸ As Dr James Hansen told colleagues at the American Geophysical Union annual conference in December 2007, ‘The evidence indicates we’ve aimed too high – that the safe upper limit for atmospheric CO₂ is no more than 350 ppm’.¹⁵⁹

In May 2011, Dr Hansen and other leading scientists issued a path-breaking paper that set forth a trajectory of global carbon reduction that could return the atmosphere to equilibrium at 350 ppm. They presented projections showing that a global decline of six per cent in fossil fuel emissions, beginning in year 2012, would lower the atmospheric concentration of CO₂ to 350 ppm by the end of the century, assuming a corresponding major effort to extract roughly 100 Gigatons of CO₂ (GtC) from the atmosphere through reforestation and improved forestry and

153 US Department of Commerce (2008). This compares to a pre-industrial revolution (1880) average of 280 ppm. See also Parenteau (2010).

154 ‘The Copenhagen Diagnosis’, Ki-moon (2009), p. 49.

155 ‘The Copenhagen Diagnosis’, Ki-moon (2009), p. 49; See also Rockstrom et al. (2009b), pp. 472–5: (temperature increase of 6°C ‘would severely challenge the viability of contemporary human societies’).

156 Union of Concerned Scientists (2007).

157 Union of Concerned Scientists (2007), p. 3. A trustee must exercise ‘reasonable prudence’ in managing trust assets. See Bogert (1987), p. 366.

158 McKibben (2007).

159 See McKibben (2007).

agricultural practices (they deemed 100 GtC the ‘largest practical extraction’).¹⁶⁰ As some climate analysts have aptly described, a return to 350 ppm involves an ‘Emergency Pathway’ of carbon emissions reduction, requiring a scale of effort that ‘can only correspond to a societal mobilization with few if any peacetime precedents ...’.¹⁶¹

Charting a pathway of reduction, of course, is not exact science. Any trajectory is tied to a probability of meeting the stated goal (or, on the flip side, a risk of not meeting it). A reduction path with a 50 per cent probability of limiting global heating to 1.5 °C will look different from a path carrying a 90 per cent probability. Moreover, there may be bumps in the trajectory as investments are made and technology is developed – it may not be a straight line headed downward. But most important to understand, trajectories might change as science develops. Just as the 450 ppm goal, now considered dangerously high, was accepted by many leading climate thinkers only half a decade ago, so might a 350 ppm limit be shown by future science as still dangerously high, or a certain trajectory of reduction not aggressive enough. As science pours in demonstrating harm from climate change, courts may have to modify their quantitative standard of trust protection.¹⁶² This kind of mid-stream adjustment is not at all unusual, for courts face the prospect of natural change in nearly all environmental cases. In cases involving fisheries, for example, courts have recognized the impossibility of accurately predicting fish runs, and have thus emphasized over and over again that ‘precise mathematical equality’ in allocating fish between states and tribes is unnecessary for the judicial remedy.¹⁶³ The fact that some facts are ‘not susceptible of rigid pre-determination’ does not defeat a court’s ability to craft a remedy. A court’s broad power of equity includes generous latitude for estimation, approximation, and adjustment.¹⁶⁴

160 Hansen et al. (2011) at 10–11. An earlier paper by other analysts had set forth a similar global trajectory, but without reliance on the assumptions of carbon drawdown through reforestation and improved soil practices. That analysis, without the carbon drawdown, presented a trajectory in which global emissions could peak in year 2011, decline an average of ten per cent a year, reach near-zero emissions by 2050, and lead to stabilization of atmospheric CO₂ concentrations of 350 ppm by 2100. Baer et al. (2009), *A 350 ppm Emergency Pathway*, pp. 1–4.

161 Baer et al. (2009), p. 4.

162 Baer et al. (2009), p. 5, discussing uncertainties and emphasizing that the 350 ppm emergency trajectory should be reviewed and updated as new science emerges. The authors point out the possibility, for example, that time could reveal that ‘Earth’s climate system is even less tolerant of elevated CO₂ concentrations than we currently fear’, or that ‘the oceanic and terrestrial sinks that we’re counting on to absorb our emissions are declining even faster than we currently fear’, either of which could indicate the need for steeper reduction.

163 *US v Washington*, 384 F Supp 312, 343 (WD Wash 1974). See discussion in Mulier (2006), at n. 165 and accompanying text.

164 See *United States v Washington*, 384 F Supp 312, 346 (WD Wash 1974).

A key factor in determining how much annual reduction is necessary is the year in which the reduction starts. Leading climate scientists stress that humanity's delay in reducing emissions 'drastically increases' both the speed at which emissions must be cut and the amount of emissions reduction required.¹⁶⁵ If humanity waits too long to bend the rising curve of emissions (that is, reach the global 'peak' in emissions and head the trajectory downward), the slope of necessary emissions reduction becomes so steep a descent that it may be impossible to achieve.¹⁶⁶ The most feasible pathways remaining have a starting point of *now*.¹⁶⁷ Moreover, as many scientists warn, delay is dangerous, because it pushes the planet closer to the unknown tipping point.¹⁶⁸ Courts should adopt the recently developed 350 ppm scientific prescription – which calls for a global trajectory of six per cent carbon emissions reduction beginning in 2012 (along with 100 GtC extraction) – as a general atmospheric fiduciary obligation shared by all co-trustee sovereigns on Earth. *This global trajectory is the marker to which courts around the world may calibrate in assigning carbon reduction pathways to sovereign trustees in their own jurisdictions.*¹⁶⁹

In the big picture, this planetary carbon reduction can only be met by every nation taking responsibility for the problem. Stated another way, the necessary global emissions reductions will be achieved only if reductions among all nations add up so as to satisfy the required 'carbon math'. Each industrialized nation must carry out its proportion of the overall planetary carbon reduction, or it will leave a major, deadly 'orphan share' on the doorstep of the world. An orphan share is a share of liability for which the liable party does not take responsibility. In the context of carbon reduction, any significant orphan share is likely to defeat global efforts to reduce emissions adequately in the short timeframe needed. No nation is equipped to adopt a significant orphan share left by another sovereign. Therefore,

165 Ban Ki-moon (2009) 'Copenhagen Diagnosis', See also Union of Concerned Scientists (2007), p. 2: (noting the 'costs of delay are high', requiring accelerated emissions reductions).

166 See Baer et al. (2009), p. 4 (delineating a global carbon reduction trajectory to achieve 350 ppm, contemplating a peak in emissions in 2011 and a ten per cent annual reduction, and noting, 'if the 350 pathway is defined to have a global peak that's a mere four years later – if emissions continue to rise until 2015 – then the subsequent decline would have to reach a nearly unimaginable rate of 20 per cent per year').

167 Ban Ki-moon (2009), 'Copenhagen Diagnosis', p. 51, fig. 22 (depicting different reduction trajectories based on start dates, but calibrating the 2C goal rather than 1.5).

168 See Ban Ki-moon (2009), p. 7: 'The risk of transgressing critical thresholds ("tipping points") increases strongly with ongoing climate change. Thus waiting for higher levels of scientific certainty could mean that some tipping points will be crossed before they are recognized'; Hansen (2009), p. 171: 'If the world does not make a dramatic shift in energy policies over the next few years, we may well pass the point of no return'; see also Hansen (2008a).

169 See *infra*: *The Anti-Waste Doctrine Applied Differentially to Carbon Reduction*.

a bedrock principle of atmospheric trust liability must be the inexcusability of orphan shares and partial orphan shares.

Causes of Action

The trust framework presents two causes of action, available to different classes of parties, to enforce the atmospheric fiduciary obligation. The first is an action by citizen beneficiaries against their governmental trustees for failing to protect their natural trust. It is well settled that beneficiaries may sue the trustee to protect their property.¹⁷⁰ In the US, for example, citizens are positioned to bring trust actions against their states or the federal government.¹⁷¹ The second is an action brought by one sovereign trustee against another for committing waste to common property. Co-tenants have a right against other co-tenants for waste.¹⁷² Nations, states, or tribal sovereigns may bring an action for waste against other nations, states or tribal sovereigns. This may be possible both in international courts, and in some cases through domestic jurisdiction. Waste and breach of trust claims find grounding within the same basic property framework; both link to the scientific prescription of carbon reduction as the expression of duty.

As with any claim, of course, a myriad of issues may bar recovery. Litigants must navigate potential barriers such as standing, sovereign immunity, pre-emption, political question doctrine, ripeness, jurisdiction, and intervention, among others. This chapter does not discuss such hurdles, as they vary considerably with the context in which the particular legal claim is brought. In charting the broad terrain of atmospheric trust litigation, however, it should be noted that courts recognizing the enormity of climate crisis and the crucial role of the judiciary may approach these barriers with a leniency that is not characteristic of past decisions. At its core, the unparalleled force of the public trust doctrine is its mandate to preserve resources for future generations. It appoints the court to police the legislature and agencies in their management of trust assets. The substantive underpinning of the doctrine thus creates powerful arguments in defence of many potential barriers.

170 See Bogert (1987) § 154 at 551: 'If the trustee is preparing to commit a breach of trust, the beneficiary need not sit idly by and wait until damage has been done. He may sue in a court of equity for an injunction against the wrongful act'.

171 *Marks v Whitney*, 491 P2d 374, 381 (Cal 1971) (private citizens have standing to sue under public trust, though a court may raise the issue on its own). Of course issues of sovereign immunity may arise in such suits, and general constitutional requirements of standing apply.

172 63C Am. Jur. 2d Property § 31; *Chosar Corp v Owens*, 370 SE2d 305, 307-08 (Va 1988) (co-tenants who allowed mining without consent of all other co-tenants were liable for waste); *Anders v Meredith*, 1839 WL 525 (NC 1839); see also *US v Washington*, 520 F2d at 685 (discussing waste in context of sovereign co-tenancy in migrating fishery).

The Anti-Waste Doctrine Applied Differentially to Carbon Reduction

To review, the essential legal starting point in atmospheric trust litigation is the fiduciary obligation to protect and prevent 'waste' to the asset. These principles bind all sovereign co-tenant trustees – that is, all nations on Earth. In the end, domestic courts must define the fiduciary obligation with a mind towards the planetary prescription for carbon reduction – it must be fully met. In an uncomplicated world that we can only imagine, the most straightforward conceptual way of accomplishing this planetary reduction would be an across-the-board mandate on all countries to reduce their own emissions according to the planetary reduction trajectory. Thus, for example, if the planetary prescription calls for a six per cent reduction in *global* emissions per year (tied to a specified uniform baseline year), then every country would have to reduce emissions by that amount. This method, indeed, would ensure that the carbon reduction 'adds up' to the required amount. Looking at it slightly differently, if each and every piece of the 'pollution pie' is reduced by a fixed amount, the pie as a whole will shrink by the same amount. If nothing else, this shows that the courts must be attentive to the planetary prescription as a marker trajectory.

The reality, however, is that countries stand on remarkably different footing, on a number of levels, regarding their carbon emissions. Some have minimal carbon emissions per capita; asking these nations to shoulder the same immediate proportionate burden as the countries with much larger amounts of per capita emissions would not only be patently unfair but impractical as well, because such reduction may compromise citizens' basic living needs. Moreover, some countries (like the United States and other industrialized nations) have contributed vastly greater amounts of historic pollution, while other countries have contributed only minimal amounts. Other key differences, described below, exist as well among nations. These challenges complicate the task of allocating liability for carbon reduction. Nevertheless, the task can be avoided only at peril to humanity's collective future. Recognizing the many disparities among countries of the world, the UNFCCC called for 'common but differentiated responsibilities' in reducing carbon emissions.¹⁷³ Unfortunately, though the UNFCCC declaration announced a useful umbrella concept, diplomatic negotiations have utterly failed to untangle the basic differences that speak to climate responsibility. Given the multitude of differentiating factors and the number of nations engaged in diplomatic processes, it is likely that the circumstantial complexity will continue to stymie efforts towards an international compact. Indeed, key differences have created an impasse between the North and the South (wealthy versus developing countries) in international negotiations.¹⁷⁴ As noted at the outset, it may well be that the task simply overwhelms international diplomacy.

173 UNFCCC, Art. 3, Par. 1.

174 Baer et al. (2008), pp. 83–90.

Despite conventional assumptions favouring international processes, judges are hardly novice to the task of formulating principled factors and arranging them into a coherent liability scheme. Their discipline, training, and processes are all geared towards applying basic principles of fairness to sets of complicated, and often disputed, facts. They regularly allocate liability among multiple players in complex natural settings and do so with the public interest in mind. For example, in the hazardous waste context, courts may impose responsibility on dozens or even hundreds of parties for cleaning up a contaminated site. They allocate scarce water supplies among hundreds or even thousands of competing claimants in river basins. In many different types of case, courts have determined the 'fair share' of responsibility that various sovereign parties must assume relative to other parties¹⁷⁵ – which, after all, is the basic task of an international carbon reduction scheme.

Of course, no liability scheme is perfect, but judicial tradition allows for arriving at rough approximations of justice rather than insisting on precise formulations that could hopelessly drag out the process. The very nature of equitable power allows judges to craft remedies to fit the circumstances. The remedies might not always carry out the various parties' rights in precise or perfect form. As one federal appellate court emphasized in approving a plan for carrying out sovereign rights to a shared treaty fishery, the remedy is an 'amalgam of delicate balancing, gross approximations and rough justice'.¹⁷⁶ And, as one famous treatise on equity observes, 'Courts of Justice aim at practical good and general convenience rather than at theoretical perfection'.¹⁷⁷ The point is important for atmospheric trust litigation remedies. Because so little atmospheric 'space' remains for further carbon pollution (that space having been largely consumed by industrialized countries), even the highest conceivable amounts of reduction by an industrialized country (most notably, the United States) will not fully compensate for its total contribution to the pollution.¹⁷⁸ The reality should not deter courts.

175 The 'fair share' was a standard for the allocating of fish between states and tribes in the Pacific treaty fishing cases, for example. See, generally, Blumm and Steadman (2009), p. 666. Courts also devised a 'fair share' standard to reflect municipal obligations to meet regional low-income housing needs. See *S. Burlington County, NAACP v Township of Mount Laurel (Mt Laurel I)*, 336 A2d 713, 724 (NJ 1975) (municipality's fair share of the present and prospective regional need).

176 *US v Oregon*, 913 F 2d 576, 580–81 (9th Cir 1990).

177 Willard (1863), p. 151.

178 See Baer et al. (2008), Executive Summary. Such liability for past pollution would best be satisfied through large international payments flowing from the industrialized nations to the developing nations. Those nations need financial compensation and technology transfers in order to accomplish carbon transition. *Id.* Though such transfers are undoubtedly part of a global climate scheme, they fall outside the classic purview of a domestic court. Developing nations in need, however, might draw upon their status and authority as co-tenant sovereign trustees of the atmosphere to pursue natural resource damages against large private corporations, which are largely responsible for carbon pollution of the atmosphere. Needless to say, such nations would have to find ways of

Carbon reduction must commence immediately – further delay risks catastrophe. The fact that any one domestic court cannot solve the whole problem should not dissuade judges. As the United States Supreme Court emphasized in *Massachusetts v EPA*, ‘[A plaintiff] need not show that a favourable decision will relieve his every injury’. As another court reasoned in allowing citizens to challenge greenhouse gas pollution for its effect on climate change:

Particularly in environmental and land use cases, the challenged harm often results from the cumulative effects of many separate actions that, taken together, threaten the plaintiff’s interest. The relief sought ... need not promise to solve the entire problem, any more than a legislative body is forbidden to enact a law addressing a discrete part of a problem rather than the entire problem.¹⁷⁹

To assess the carbon reduction responsibility of their own nations, domestic courts should refer to the planetary prescription for carbon reduction as a marker. Ultimately, any climate prescription will likely call for near-zero carbon emissions to be achieved by a future date, most likely 2050.¹⁸⁰ Courts of various countries, then, must impose a timeline for reducing emissions with an endpoint that achieves near-zero emissions. Courts that shorten the timeframe for achieving near-zero emissions will effectively impose a steeper curve of reduction.¹⁸¹ While on one hand it may seem an inherently arbitrary task for a court to devise a timeframe, on the other hand, courts do this all the time. In nearly every enforcement case, judges have to impose timeframes for their remedies. They do so on the basis of reason and equity, both of which should govern climate responsibility. At least five factors inform a judicially-imposed carbon reduction path. All of these factors have surfaced in international discussions and literature, but they have never been arranged into a basic formula of responsibility.

The first factor is the country’s global share of carbon emissions. The United Nations compiles data that shows every nation’s slice of the carbon pollution pie.¹⁸² The United States and China lead as the top two polluters in the world, each with about a 20 per cent share.¹⁸³ The top ten polluters account for roughly

enforcing such monetary judgements in the polluters’ home countries where the assets are located. Such an initiative is not included in this description of ATL, but it complements the trust strategy contained herein for holding governments accountable for carbon reduction.

179 *NEDC v Owens Corning Corporation*, 434 F Supp 2d 957, 968 (D Or 2006).

180 See Baer et al. (2009), pp. 1–4.

181 By way of illustration, an 80 per cent reduction of pollution by 2020 will require far more aggressive annual reduction than achieving the same by 2040, assuming the same baseline year from which the reduction is calibrated.

182 See United Nations, Millennium Development Goals Indicator, Carbon Dioxide Emissions (CO₂), Thousand Metric Tons of CO₂ (CDIAC), available at <http://mdgs.un.org/unsd/mdg/SeriesDetail.aspx?srid=749&crd=>.

183 For a user-friendly presentation of global greenhouse pollution data, see *List of Countries by Carbon Dioxide Emissions*, available at <http://en.wikipedia.org/wiki/>

two-thirds of the world's total carbon pollution.¹⁸⁴ Judges in those countries should impose a particularly aggressive timeframe for carbon reduction, paying heed to the planetary baseline as a minimum reduction trajectory. They should search the outer bounds of feasibility – bearing constant mind to the reality that, if carbon reduction does not happen in their countries, major orphan shares of carbon will loom, shares potentially capable of plunging the planet into full catastrophe.

The second factor is historical emissions. In other legal contexts, historical practices alone are the basis of liability. If the atmosphere were a straightforward hazardous waste dump, for example, it could be cleaned up with money from an overall clean-up fund. The various liable parties would contribute money according to their equitable share.¹⁸⁵ The problem with climate crisis, however, is that there is no way to simply pay for 'cleaning up' the atmosphere, because there is no technology to artificially 'draw down' carbon. Unlike a relatively simple clean-up of a hazardous waste site, the historical emissions factor is not easily translatable into quantified responsibility for carbon reduction. It is, however, an equity factor that can reinforce an aggressive trajectory of reduction. (Certainly, on this level, the United States bears a colossal share of responsibility.)

A third factor is the country's 'per capita emissions'. This is the amount of carbon dioxide emitted on average by each person in the particular country.¹⁸⁶ The numbers vary widely, generally reflecting the dichotomies between the industrialized and emerging nations. The American lifestyle, for example, produces nearly 20 metric tons of carbon dioxide emissions per capita on average.¹⁸⁷ India, on the other hand, produces only about 1.16 metric tons of carbon dioxide pollution

List_of_countries_by_carbon_dioxide_emissions#List_of_countries_by_2007_emissions (hereinafter *List of Countries*). Data from 2007 showed that China had about a 22 per cent share, and the U.S. had nearly a 20 per cent share. The UN compiles detailed data on the greenhouse gas emissions of most countries of the world. See UNFCCC, *GHG Data from UNFCCC*, http://unfccc.int/ghg_data/ghg_data_unfccc/items/4146.php.

184 See *List of Countries*, *supra* n. 183.

185 A common law doctrine known as contribution assigns responsibility and liability among joint tortfeasors based on equitable factors. See generally, 18 Am Jur 2d Contribution § 1. Principles of joint liability allow courts to apportion liability among joint contributors. See Restatement 2d of Torts, § 433(a), Apportionment of Harm to Causes; see also *Burlington Northern & Santa Fe Ry v United States*, 129 S Ct 1870 (2009) (apportioning harm in hazardous waste cleanup context). In hazardous waste cleanups, courts use several factors to equitably allocate shares of liability. See, for example *Action Mfg Co v Simon Wrecking Co*, 428 F Supp 2d 28, 93–94 (ED Penn 2006).

186 See *List of Countries by Carbon Dioxide Emissions Per Capita*, available at http://en.wikipedia.org/wiki/List_of_countries_by_carbon_dioxide_emissions_per_capita; see also Union of Concerned Scientists, *Each Country's Share of CO2 Emissions*, available at http://www.ucsusa.org/global_warming/science_and_impacts/science/each-countrys-share-of-co2.html (using 2006 data from Energy Information Agency, Department of Energy).

187 See n. 186.

per person on average.¹⁸⁸ Both nations are among the top five polluters of the planet (reflecting a huge population disparity between the two).¹⁸⁹ The implication of this per capita emissions data is that some countries are using more than what could be considered their 'fair share' of carbon. Countries on the low-carbon-per-capita end of the spectrum include Brazil, Vietnam, the Philippines, Ghana, and Bangladesh, for example, all of which produce under two metric tons per capita.¹⁹⁰ On the far other end (along with the United States) are Luxemburg, Australia, Canada, Kuwait, and Qatar, for example. These countries have what could be called 'grossly unsustainable' per capita rates, ranging from 15 tons per capita up to Qatar's off-the-charts rate of 56.2 tons per capita.¹⁹¹ These higher rates reflect both excessive consumption and capacity for dramatic reduction, both of which justify imposing a steep trajectory of carbon reduction.

A fourth factor is not easily obtainable from United Nations data, but is directly relevant to the waste doctrine. It is the purpose behind the activity causing the carbon emissions. The public trust doctrine examines the purpose behind using critical public resources,¹⁹² and the traditional waste doctrine looks askew on extravagant uses, particularly in situations of scarcity. Water courts and allocation statutes, for example, prioritize domestic use of water over commercial use when water is in short supply.¹⁹³ Courts faced with atmospheric trust litigation can, and should, make similar judgements. As scientists emphasize, the planet has a limit to the amount of carbon pollution that it can absorb before crossing into a realm of catastrophic, and irrevocable, planetary heating. Some scientists have tried to quantify that amount in terms of a carbon budget for the world. Viewed in this way, the available 'space' for remaining carbon pollution is a scarce resource in itself. Like a river with too little water, the atmosphere has multiple demands, and courts must inevitably prioritize those calls on the resource. The trajectory of carbon reduction should be steeper for non-essential uses. To contend otherwise

188 See n. 186.

189 See n. 186

190 See n. 186.

191 See n. 186.

192 See, for example, *Robinson v Ariyoshi*, 65 Haw 641, 674, 658 P2d 287, 310 (Haw 1982) (public trust duty includes duty to 'assure that the waters of our land are put to reasonable and beneficial uses' and to 'assure the continued existence and beneficial application of the resource for the common good').

193 See, for example, OREGON. REV. STAT. ANN. § 540.140 (2010) ('When the waters of any natural stream are not sufficient for the service of all those desiring the use of the same, those using the water for domestic purposes shall, subject to such limitations as may be prescribed by law, ... have the preference over those claiming such water for any other purpose, ... and those using the water for agricultural purposes shall have the preference over those using the same for manufacturing purposes'); Amos (2008) ('When water rights with the same priority date are in mutually exclusive conflict, domestic uses have preference over all others, and agricultural uses have preference over manufacturing uses').

ignores the reality that there is simply not enough ‘space’ left for all of the carbon pollution that ‘Business As Usual’ produces.

In this vein, it is helpful to organize the carbon emissions into three categories that logically carry descending order of priority: 1) domestic; 2) transition; and 3) luxury. Much like in the water context, ‘domestic carbon’ connotes pollution made in service of basic human needs – which would describe the cook stoves of India or Tibet, or energy needed to heat homes for basic health and comfort. ‘Transition carbon’ signifies the pollution needed to create new infrastructure for a low-carbon society (pollution resulting from the manufacture of bicycles, windmills and solar panels, for example). ‘Luxury carbon’ denotes pollution caused by non-essential and frivolous needs. The English government recently tagged this type of carbon pollution by rejecting new airport runways near London that would serve ‘binge flying’ – described to include ‘jetting off to weekend homes in Spain and bachelor parties in Prague’.¹⁹⁴ As the damaging activity becomes more excessive relative to the basic needs of the general population, it becomes less tolerable from an equity and waste standpoint. Just as water courts may curtail luxury uses of water in times of scarcity, so might courts impose a steep trajectory of reduction on luxury carbon emissions. By the same reasoning, countries with large populations that emit most carbon pollution in service of domestic purposes and basic human needs may formulate trajectories that provide for meeting those needs, while spending available transition carbon in furtherance of a new low-carbon infrastructure. The waste doctrine is sufficiently elastic to accommodate such considerations, if courts are perspicacious enough to recognize them.

The fifth factor is the recalcitrance of the sovereign in taking responsibility for its carbon pollution. Here again, countries stand in markedly different positions. While some have made great efforts to reduce their pollution, others (like the United States) have made little progress. In the past, courts overseeing environmental cleanup settlements have delivered what is called a ‘penalty for recalcitrance’, which amounts to an extra monetary amount imposed as punishment for not settling or co-operating earlier.¹⁹⁵ The same approach may be suited to the climate context. The gross abdication of responsibility on the part of huge polluters like the United States has pushed the planet precariously close to the tipping point. There is little doubt that the failure of the industrialized nations to cut their pollution sooner will result in untold damage to the Earth’s resources. The penalty for recalcitrance should translate into a steeper, more urgent, emissions reduction trajectory for such countries.

By way of summary, in order to save the planet, judicial decisions worldwide must set the various nations on a course of *aggregate carbon reduction* that meets the planetary prescription set by climate scientists. The UNFCCC set the framework for ‘common but differentiated responsibilities’, but failed to quantify

194 See Rosenthal (2010).

195 See, for example, *Simon Wrecking Company*, 428 F Supp 2d at 99–100 (noting availability of recalcitrance penalty but finding it not suitable for that case).

the various nations' obligations in concrete terms. Through the waste doctrine, courts can give quantitative definition, and enforcement, to this international standard. Just as contemplated by the UNFCCC, the waste doctrine – deriving from longstanding equitable concepts – moulds itself to variable circumstances.¹⁹⁶ The factors explained above indicate parameters of flexibility.

Much of the work in extrapolating individualized sovereign trajectories for carbon reduction from these equitable factors has already been done in a leading analysis, the *Greenhouse Development Rights Framework* (GDRF), prepared by the Stockholm Environment Institute and EcoEquity.¹⁹⁷ The GDRF presents a framework of responsibility based on the UNFCCC's standard of common and differentiated responsibilities (which, again, also reflects an anti-waste standard).¹⁹⁸ The GDRF template is fixed by two parameters – 'responsibility and capacity' – that bring some definition to the first four factors explained above. 'Responsibility' is a proxy for the country's contribution to atmospheric contamination based on historic cumulative emissions since 1990.¹⁹⁹ 'Capacity', generally derived from national financial data, reflects the ability of the nation to carry out carbon reduction without threatening the basic survival capacity of its population. To this end, the capacity parameter excludes the income demanded by the necessities of daily life.²⁰⁰ 'Capacity' is a more nuanced approach than mere per capita income average, because it 'takes explicit account of the unequal distribution of income within countries'.²⁰¹ Using these two factors, statistical data for individual countries are assembled into a straightforward 'Responsibility Capacity Index' or RCI, which represents each country's logical share of the global 'ecological debt'.²⁰² Then, based on each nation's RCI, the report delineates individualized carbon reduction trajectories for each nation.²⁰³ Crucially, the pathways are correlative and cumulative, *designed to calibrate to, and collectively meet, a planetary trajectory for necessary carbon reduction*. The RCI approach thereby offers a global distribution scheme of carbon reduction – one tied to the logical factors that both quantify the duty against waste and also give concrete meaning to the UNFCCC's standard of 'common but differentiated responsibilities'. As the authors describe, the GDRF 'proceeds in the only possible way, by operationalizing

196 See, generally, Willard (1863), p. 370 (describing different standards of waste between England and the United States).

197 Baer et al. 2008.

198 Baer et al. (2008), Executive Summary, p. 16.

199 Baer et al. (2008), Executive Summary, p. 18 (but excluding emissions attributable to consumption below the development threshold).

200 Baer et al. (2008), Executive Summary, pp. 16–17 (defining 'capacity' as total national income excluding income below a 'development threshold').

201 Baer et al. (2008), Executive Summary, p. 18.

202 Baer et al. (2008), Executive Summary, pp. 17–19; see also Baer et al. (2008), pp. 93–8 (Table A1, presenting RCI for all countries).

203 Baer et al. (2008), pp. 76–9.

the official principles of the [UNFCCC]'.²⁰⁴ Moreover, the formula is designed to move forward through time, incorporating change within a stable framework of equity. As a template for allocating carbon reduction, the GDRF can yield revised trajectories as data changes both in respect to the nations' individualized circumstances²⁰⁵ and the globe's atmospheric needs (which may be re-defined as more scientific data emerges).²⁰⁶

In sum, the waste principle creates a domestic legal framework that positions nations of the world in an equitable relationship with each other while calibrating to planetary requirements of carbon reduction. Principles of trust responsibility can yield quantitative measures applicable to all governments of the world, enforceable through domestic processes in nations having independent judicial branches. The GDRF allows domestic courts to assign individual sovereign responsibility as part of a macro, uniform approach to global carbon reduction. Of course, ATL will not culminate in successful judgements in every nation. There will still be enforcement gaps leaving 'orphan shares' of liability for carbon emissions reduction. Nevertheless, use of the atmospheric trust framework described herein should impose a frame of fundamental sovereign obligation that exposes orphan shares to the citizens of the world and thereby advances efforts to hold governments accountable in both the domestic political realm and in the context of international negotiations. This approach gives domestic force, through the courts, to the UNFCCC's expressed duty to carry out carbon reduction according to 'common but differentiated responsibilities' – a principle agreed to by nearly every nation on Earth, yet persistently obviated by international diplomatic impasse.

Relying on a judicially created property law framework to give meaning to treaty obligations is not unprecedented. In the United States, there is a rich history of courts interpreting and enforcing broad treaty obligations as to natural resources shared between sovereigns. The Indian fishing cases, originating out of fish allocation disputes between states and tribes, gave rise to a vast and much celebrated body of case law that gave detailed interpretation to basic treaty language. The language was sparse, reserving Indian rights to take fish 'in common with' the non-Indian settlers.²⁰⁷ Without the willingness of courts to define, in practical terms, the rights and responsibilities arising from this basic treaty obligation, Indian fishing that had endured 10,000 years surely would have been extinguished by industrialization. No state legislature was willing to carry out the

204 Baer et al. (2008), p. 16.

205 For example, the authors show how China's burden would triple between 2010 and 2030 if it continues its rapid growth and wealth increase. See Baer et al. (2008), p. 19.

206 The trajectories in the GDRF were calibrated to the former goal of 2 °C., which, as previously noted, will not be sufficient to protect the planet's major fixtures. The authors are currently in the process of recalibrating the RCI, based on updated data, to the 350 trajectory associated with the 1.5 °C degree goal.

207 See Blumm and Steadman (2009), p. 654 (citing treaty language) (emphasis added).

treaty promise that the United States had solemnly agreed to. In recent times, these same federal courts have advanced their common law jurisprudence to confront the modern crisis of extinction. Still relying on the basic treaty promise and the property inferences they spawned, courts have defined duties of environmental protection of the imperilled fish and the waterways that sustain them.²⁰⁸ Even as some courts today hesitate to confront climate change, it is worth remembering that, based on just three key words lodged in the Indian treaties, United States courts constructed a co-tenancy framework, declared a waste principle, and created detailed, practical remedial structures to give force and effect to sovereign property rights.²⁰⁹ Today, courts confront basically the same task. In order to save the planet from catastrophic heating, they must give force to the public trust responsibility towards the atmosphere, which finds elucidation in the principled language of the UNFCCC.

While the suggested analysis may seem over-simplified in response to multifarious policy concerns and complex science, the urgency in launching planet-saving efforts requires a decisive and straightforward approach that the judicial branches of government can spearhead across the planet through atmospheric trust decrees. The fact that any one court cannot enforce a global reduction scheme – because its jurisdiction is domestic – should not dissuade courts of any nation. As the United States Supreme Court recognized in *Massachusetts v EPA*, the climate problem can be tackled on the domestic level despite the lack of jurisdiction over other nations: ‘Nor is it dispositive that developing countries such as China and India are poised to increase greenhouse gas emissions substantially over the next century: A reduction in domestic emissions would slow the pace of global emissions increases, no matter what happens elsewhere’.²¹⁰

In this manner, atmospheric trust litigation invokes a decentralized judicial strategy to achieve what has long eluded the centralized (and thus far ineffectual) diplomatic system of treaty negotiation. Of course, any decentralized approach may yield variable results across jurisdictions. But variability may be neither an outrageous nor unwelcome prospect. It is perhaps time to recognize that, while uniformity is well suited to times of stability, times of crisis might be best met by innovation and experimentation. If anything, the decades-long quest for a centralized international climate compact has caused dangerous stagnation in domestic response and threatens to draw standards down to the lowest common denominator. Atmospheric trust litigation breaks the mould by inviting judicial innovation in defining and enforcing carbon emissions reduction at the domestic level, worldwide. Moreover, the global marker trajectory provides a baseline that offers a consistent starting point to this process.

208 Blumm and Steadman (2009): (describing treaty litigation as it moved into habitat protection); see also Blumm and Swift (1998).

209 For background, see Blumm and Steadman (2009).

210 *Massachusetts v Environmental Protection Agency*, 549 US 497, 500 (2007).

Forms of Relief

It is important to design a remedy for atmospheric trust litigation with a view towards providing the macro relief necessary to fulfil the sovereign's share of global emissions reduction. Both declaratory and injunctive relief are appropriate in the atmospheric trust context.²¹¹ As to the first, a declaratory judgement is a straightforward remedy that can greatly advance the task of clarifying responsibilities of governments worldwide in addressing climate crisis. A declaratory judgement should clearly iterate the following principles:

1. all governments have a fiduciary obligation, as trustees, to protect the atmosphere as a commonly shared asset;
2. all governments bear liability for reducing carbon emissions;
3. this fiduciary obligation is organic to government and permits no orphan shares or partial orphan shares of responsibility;
4. the fiduciary obligation is enforceable by the citizen beneficiaries of the trust representing present and future generations;
5. the fiduciary obligation and the concomitant duty to prevent waste is enforceable by co-tenant trustees;
6. the fiduciary obligation calibrates to a scientific prescription for carbon reduction designed to restore global carbon dioxide levels to below 350 parts per million.²¹²

Judicial declarations setting forth the trust framework for atmospheric obligations in this manner may alone spur some carbon reduction, because the mere declaration of responsibility from a constitutional branch of government furnishes citizens with the conceptual tools they need to hold their governments accountable.

Declaratory relief should, if possible within the governing legal system, be accompanied by suitable injunctive relief that allows courts to provide a remedy on a macro level without invading the province of the political branches.²¹³ Courts

211 Sovereign trustees are also positioned to pursue natural resource damages against atmospheric polluters, but that claim is outside the scope of this chapter. The claim might be confused with, but is theoretically quite distinct from, nuisance cases brought by states against major polluters. For an overview of climate nuisance theory, see Merrill (2005). Natural resource damages are common in oil spill cases such as the BP oil spill (off the Gulf of Mexico), and the Exxon Valdez spill (off the coast of Alaska). For a brief discussion of natural resource damages in the context of climate, see Wood (2008).

212 While declaring macro sovereign responsibility, this iteration of the atmospheric trust principle seemingly satisfies the rule that a declaratory judgement should not be a 'general admonition', but must be narrowly crafted to define a duty according to 'concrete facts presented in a particular dispute'. *United States v Washington*, 2007 US Dist LEXIS 61850 *23 (WD Wash. 2007).

213 *Weinberger v Romero-Barcelo*, 456 US 305, 312 (1982) (the basis for injunctive relief is a finding of irreparable injury and the absence of an adequate legal remedy).

have emphasized that the core purpose of the public trust doctrine is to police the other branches of government in their disposition of public assets.²¹⁴ In the United States, by drawing on traditional relief available against co-tenants and trustees for misuse of property, courts may require carbon accountings and enforceable carbon budgets as remedies for sovereign breach of the atmospheric fiduciary obligation without reaching into the law-making purview of the other branches. In other countries, these same tools may be extrapolated to fit the unique judicial function within those systems.

An accounting is a traditional remedy springing from the equitable powers of the court in both the co-tenancy and trust contexts.²¹⁵ It is a judicial process whereby co-tenants or trustees must account for expenses and/or profits in connection with the trust; it allows beneficiaries to ensure the proper management of their trust assets.²¹⁶ Accordingly, courts have held that ‘any beneficiary, including one who holds only a present interest in the remainder of a trust, is entitled to petition the court for an accounting’.²¹⁷ The accounting also plays a role in the co-tenancy context, in that each co-tenant is responsible for his share of the expenses, and is due his share of the profit from the property.²¹⁸ The scope of an accounting

214 See *Ariz Ctr for Law in the Pub Interest v Hassell*, 837 P2d 158, 169 (Ariz Ct App 1991) (‘The check and balance of judicial review provides a level of protection against improvident dissipation of an irreplaceable res’); see also *Lake Michigan Federation v United States Army Corps of Engineers*, 742 F Supp 441, 446 (N D Ill 1990) (‘The very purpose of the public trust doctrine is to police the legislature’s disposition of public lands’).

215 See, for example, *Evans v Little*, 271 SE 2d 138, 141 (Ga 1980) (co-tenancy); *Willmon v Koyer*, 143 P 694, 695 (Cal 1914) (‘As an incident to a co-tenancy relationship, either co-tenant has a right to demand of the other an accounting as to rents and profits of the co-tenancy, which of course, involves the right of one co-tenant to have refunded to him by the other his proportion of any expenditures made for the benefit of the common property’); *Zuch v Conn. Bank & Trust Co*, 500 A2d 565, 568 (Conn App 1985) (‘As a general matter of equity, the existence of a trust relationship is accompanied as a matter of course by the right of the beneficiary to demand of the fiduciary a full and complete accounting at any proper time’) (citations omitted); *Cobell v Norton*, 240 F3d 1081 (DC Cir 2001) (*Cobell VI*) (accounting against federal government for mismanagement of Indian trust funds).

216 *Evans*, 271 SE 2d at 141.

217 *In re Estate of Ehlers*, 911 P2d 1017, 1021 (Wash App 1996) (citing *Nelsen v Griffiths*, 585 P2d 840, 843 (Wash App. 1978)).

218 See, for example, *Garber v Whittaker*, 174 A 34, 37 (Del Super Ct 1934) (‘Tenants in common of the legal title to land are ordinarily entitled to the use, benefit and possession of such land, including their just and proper shares of the rents and profits therefrom’); *Willmon v Koyer*, 143 P 694, 695-96 (Cal 1914) (‘The rule is that when one tenant in common has paid a debt or obligation for the benefit of the joint property, or has discharged a lien or assessment imposed upon it as a common burden, he is entitled as a matter or right to have his co-tenant, who has received the benefit of it, refund to him his proportionate share of the amount paid’); see also Stoebuck and Whitman (2000) (where a co-tenant derives income from a use of land that permanently reduces its value, the co-tenant must account to the other co-tenants); *White v Smyth*, 214 S.W.2d 967, 978 (Tex. 1948) (‘When it

must include 'all items of information in which the beneficiary has a legitimate concern'.²¹⁹ In the financial context, this means a statement 'in clear and concise terms of the nature and value of the corpus of the trust ... and the amount and location of any balance or remainder'.²²⁰

In the context of atmospheric trust litigation, an accounting would take the form of quantifying carbon emissions and tracking their reduction over time. This form of accounting is an extrapolation from the traditional remedy in two ways. First, it is applied against a sovereign trustee, not a private trustee. It is well established in the US, however, that a sovereign defendant may be subject to an accounting for mismanagement of a trust. In the federal Indian law context, recently, the US government was subject to a multi-billion dollar accounting action for its mismanagement of tribal trust funds.²²¹ Second, a carbon accounting draws upon a tool developed in the financial context and tailors it to the natural context. Commentators have advocated trust accountings in the natural resources area, and such a leap should be well within the imagination of judges.²²² Courts have essentially engaged in natural 'accountings' in the environmental context before, without using the label. For example, courts are quite familiar with assigning monetary value to resources and awarding natural resource damages to governmental trustees.²²³ Moreover, in determining rights to fish runs or water resources shared between states and tribes, courts delve deeply into the quantitative aspects of beneficial resource use.²²⁴

The accounting required by atmospheric trust litigation consists of a judicially-supervised quantification of the amount of greenhouse gas pollution emitted by the sovereign defendant. The accounting establishes the current carbon pollution emitted on the particular jurisdictional level (local, state, or federal) so as to define a baseline and then tracks progressive reduction over time. Modern modelling is capable of quantifying a carbon footprint on virtually any scale, from individual to global. Much of the necessary data has been developed and is already accessible. In the United States, for example, the Department of Energy maintains data on the overall carbon emissions of all 50 states.²²⁵ While inevitably there will be areas

is claimed that a co-tenant in possession of ... property has become liable to his co-tenants for profits accruing from his productive operations, the usual mode of settling the account is to charge him with all his receipts and credit him with all his expenses, thereby ascertaining the net profits available for distribution [among co-tenants]'.²¹⁹

219 *Zuch*, 500 A2d at 568.

220 *Zuch*, 500 A2d at 568.

221 See *Cobell v Kempthorne*, 455 F3d 317, 319–21 (DC Cir 2006) (describing background of litigation).

222 See Torres (2002), p. 547 (calling for accounting); Babcock (2009), p. 410.

223 See, generally, *Coeur D'Alene Tribe v Asarco Inc.*, 280 F Supp 2d 1094 (D Id 2003).

224 See, generally, Wood (2000).

225 Raw data for state carbon dioxide emissions are available from the Energy Information Administration, US Department of Energy, *Energy Emissions Data and Environmental Analysis of Energy Data*, available at <http://www.eia.doe.gov/environment.html>.

of dispute regarding some emissions sources, particularly mobile sources, the methodology for measuring jurisdictional carbon footprints will continue to be refined as professional standards emerge in the field of carbon accounting.

Carbon accounting allows co-tenants and beneficiaries of the trust to evaluate government's measures to protect the atmospheric trust. Without such an accounting, the legislatures can easily mislead the public into thinking that carbon reduction measures are adequate – whereas in fact they may grossly exceed the planet's capacity to assimilate pollution. As Professor Coplan points out in his article on the atmospheric trust, legislative cap-and-trade bills in the US have not been tied to any sustainable capacity of the atmosphere; instead, they have offered a scheme to privatize pollution rights 'far in excess of the IPCC-determined maximum sustainable emissions'.²²⁶ He notes: 'In essence, the sovereign 'trustee' would invade the public trust 'corpus' to make distributions in excess of the sustainable yield of the atmospheric 'trust''.²²⁷ A judicially supervised accounting process would expose such legislative misappropriations of the people's atmospheric trust.

While an accounting remedy provides the means whereby a beneficiary or co-tenant can measure the performance of a governmental trustee, additional injunctive relief is necessary to enforce the sovereign duty to restore the natural trust where it has been damaged. At a very simple level, the fiduciary obligation to reduce carbon pollution (per a judicially set trajectory) can be carried out through a 'budget' for carbon reduction over time that sets forth quantifiable mileposts. The jurisdiction must develop a plan containing measures calibrated to bring about such reduction.²²⁸ Enjoining the sovereign to do so does not invade the prerogatives of the other branches, because the court does not dictate to the trustee how to accomplish the carbon reduction. Cities, counties, and states have wide latitude in devising plans that are tailored to the unique circumstances of their jurisdiction. In this respect, the trust remedy may strike the ideal balance between necessarily potent, macro judicial enforcement and traditional deference to the political branches.

Because carbon reduction must occur steadily over the long term, a court must maintain on-going jurisdiction over an ATL case. Continuing jurisdiction is a regular feature of litigation requiring protracted remedies against government institutions.²²⁹ Over time, the court must receive periodic progress reports, a common feature of accounting cases. These reports inform the court and the

226 Coplan (2010), p. 330.

227 Coplan (2010), p. 330.

228 Proposed British legislation provides an example of a 'carbon budget'. (2007) 'Britain Proposes Bold Environmental Legislation That Could Pave Way for Post-Kyoto Pact'.

229 In the Pacific Northwest treaty litigation, for example, federal courts have recognized the need for ongoing jurisdiction, which has lasted over three decades. See, for example, *United States v Washington*, 384 F Supp 312, 346 (WD Wash 1974) (acknowledging, in context of a treaty fishing dispute between a state and tribes, that the remedy in face of changing conditions is best carried out through 'retention of continuing

beneficiaries whether the trustee is making adequate progress in accordance with the budget and plan. Trust accountings are usually performed on a regular basis, such as quarterly, biannually or annually, and contain an updated inventory of the *corpus* or *res* (the assets of the trust).²³⁰ In the case of ATL suits, the reports would show the jurisdiction's progress in reducing carbon during the reporting period. In view of the narrow window of time remaining before climate thresholds are crossed, courts are justified in requiring carbon accounting reports every quarter or, at the very least, every six months. Such reports should be posted on websites so as to be easily accessible to the sovereign's own citizen beneficiaries, world citizens, and to other ATL courts.

While some judges may be overwhelmed by the novel and all-encompassing context of carbon reduction, it is important to bear in mind that the envisioned judicial role is much the same as in other natural resource contexts where courts enforce management and/or recovery of diminished natural assets. Again, the treaty fishing cases of the late 1960s and 1970s provide a model. The recalcitrance of state fishery managers against allowing tribal harvest was so embedded in state governance that the district courts of Oregon and Washington tasked themselves with detailed supervision of tribal and state salmon harvests.²³¹ The federal district court of Oregon created a consent decree structure whereby the states and tribes developed a judicially supervised and enforceable plan for future harvest of the salmon.²³² More recently, in the ESA lawsuits over the imperilled Columbia River salmon, the same court has assumed a rigorous role overseeing the development of a fish recovery plan pursuant to a process of multi-sovereign consultation structured by the court.²³³ Courts have supervised broad plans to address exclusionary zoning, racial desegregation, and prison reform.²³⁴ While courts must be cognizant of appropriate judicial boundaries in structuring relief for trust violations, they arguably have wide latitude in requiring sovereigns to develop

jurisdiction, more appropriate than overly-detailed judicial predetermination') (citation omitted); see also Blumm and Steadman (2009) (summarizing litigation).

230 See, for example, *Fraser v Southeast First Bank of Jacksonville*, 417 So2d 707, 708 (Fla 5 Dist App 1982) (citing Florida statutes); *Cobell v Norton*, 240 F3d 1081, 1086 (DC Cir 2001) (*Cobell VI*) (quarterly reports in Indian trust litigation against the federal government).

231 See *Puget Sound Gillnetters Ass'n v US Dist. Court*, 573 F 2d 1123, 1133 (9th Cir 1978); *United States v Washington*, 520 F2d 685, 686, 693 (9th Cir 1975); see also discussion at Wood (2006), pp. 10176–7.

232 See discussion at Wood (1998).

233 See Wood (2006), pp. 10175–6.

234 See *Coleman v Schwarzenegger*, 2009 WL 2430820 (ED Cal 2009) (Three Judge Federal Court, August 4 2010) (prison reform case), available at <http://www.caed.uscourts.gov/caed/Documents/90cv520o10804.pdf>; *Southern Burlington County, NAACP v Township of Mount Laurel*, 336 A2d 713 (NJ 1975) (Mt Laurel I) (land use reform); *Southern Burlington County, NAACP v Township of Mount Laurel*, 456 A2d 390 (NJ 1983) (Mt Laurel II)(same); see also discussion in Singer (2006).

enforceable plans for proper trust management.²³⁵ Judicial consent decrees are an ideal tool for holding sovereign defendants to court-imposed obligations, yet allowing for regulatory expertise in developing and carrying out a detailed remedy structure.

Although courts will not be able to enforce every minute detail of a carbon reduction plan, many courts have it well within their power to force carbon reduction through discrete injunctive measures tailored towards obvious carbon sources. An injunction may contain 'backstops' that consist of measures the court will mandate if the budget is not carried out. The broad realm of environmental and land use litigation provides precedent for many measures that may serve as effective backstops. Such measures might include, for example, injunctions prohibiting new coal-fired plants, large-scale logging, recreational vehicle use on public lands, airport expansions, sewer hook-ups, issuance of air pollution permits, and a myriad other activities.²³⁶ It is within the traditional province of courts of equity to devise relief to remedy the harm.²³⁷ Of course, the ultimate enforcement mechanism is to hold government officials personally in contempt of court for failure to carry out court-ordered fiduciary duties.²³⁸

235 See *Cobell v Kempthorne*, 455 F3d 317, 330–31 (DC Cir 2006) (reviewing reversals of district court remedies in an Indian trust accounting case); *Cobell v Norton*, 283 F Supp 2d 66 (D DC 2003), rev'd on other grounds, 392 F3d 469 (DC Cir 2004).

236 See, for example, *United States v Metropolitan Dist Comm'n*, 757 F Supp 121, 128–29 (D Mass 1991), *aff'd*, 930 F2d 132 (1st Cir 1991) (moratorium against sewer hook up); Jeffery J Matthews, (1999) (discussing injunctions imposing moratoria against sewer hookups); *American Motorcyclist Ass'n v Watt*, 543 F Supp 789, 798 (C D Cal, 1982) (enjoining off-road vehicle use because agency plan did not comply with the statute); *Pacific Rivers Council v Thomas*, 30 F3d 1050 (9th Cir 1994) (enjoining the US Forest Service from proceeding with projects under land resource management plans prior to ESA consultation); *Lane County Audubon Soc'y v Jamison*, 958 F2d 290, 294 (9th Cir 1992) (enjoining the BLM from new timber sales until ESA consultation was completed); *Thomas v Peterson*, 753 F2d 754 (9th Cir 1975) (enjoining construction of road until agency prepared biological assessment); *Oregon Natural Desert Assn v Singleton*, 75 F Supp 2d 1139 (D Or 1999) (permanently enjoining domestic livestock grazing in all 'areas of concern'). While most of the precedent for such injunctions is grounded in claims brought under statutory law, the relief awarded is typically not statutorily mandated, but rather devised by a court to afford a meaningful remedy.

237 See *Alaska Cir for the Env't v Browner*, 20 F3d 981, 986 (9th Cir 1994) ('The district court has broad latitude in fashioning equitable relief when necessary to remedy an established wrong'); *Weinberger v Romero-Barcelo*, 456 US 305, 311 (1982) ('The essence of equity jurisdiction has been the power of the [court] to do equity and to mould each decree to the necessities of the particular case. Flexibility rather than rigidity has distinguished it').

238 See, for example, Gouras (2008): (district court threatened to hold US Agriculture Undersecretary Mark Rey with contempt of court and jail time for the agency's 'systematic disregard of the rule of law').

The above discussion provides mechanisms by which a court may enforce aggressive and sustained carbon reduction in a particular sovereign jurisdiction. As the prior discussion noted, this task is both urgent and feasible for the industrialized world. The ATL remedy might be immediately aimed at different objectives in the developing world. As noted earlier, while all countries of the world stand as co-trustees of the atmosphere, developing nations are situated differently from the industrialized nations. Trajectories for carbon reduction for the developing countries will look much different, in part because such nations presently contribute a smaller amount of the global pollution and because they lack the finances to afford rapid transition to a low-carbon economy. This, however, does not mean that atmospheric trust litigation is any less important in these countries. To the contrary, it is equally imperative for several reasons.

First, the atmospheric trust, as a macro approach to climate, is truly global. The framework requires judicial acknowledgement that every sovereign, not just willing sovereigns, bear responsibility for atmospheric health. The declaratory judgements issued by courts in developing countries can be instrumental in setting forth the principles of the atmospheric trust and creating the framework for global reduction. Such declarations of principle may be persuasive to courts of industrialized nations. Second, if the planet is to achieve near-zero carbon emissions, every country must ultimately participate in the effort, despite the differing timeframes for doing so. It will be important for courts of developing nations to require their governments to take the initial step of planning a transition to near-zero carbon emissions and setting a cost on funding that transition. Third, this cost quantification will send a signal to the industrialized world on how much funding assistance is necessary, and in this sense, court-ordered reduction plans may have a significant impact on the diplomatic realm. Fourth, such plans may provide a basis for natural resource damage recovery actions by developing nations against atmospheric polluters in their own domestic legal systems. By recognizing a trust framework, all sovereigns theoretically have grounds for recovering damages from third parties who destroy the trust. It is a settled principle of trust law that trustees have the affirmative duty to recoup monetary damages against third parties that destroy trust assets.²³⁹ These funds, gained from the private fossil-fuel industry polluters, could substantially help finance the zero-carbon economic transition in the developing world.²⁴⁰

Fifth, ATL suits that establish a carbon reduction trajectory in developing countries will likely have an impact on the energy assumptions driving economic growth scenarios in those countries. The political branches in developing nations may be more inclined to invest in renewable energy than in the cheaper fossil fuel energy if faced with an ATL judgement forcing carbon reduction over the long term. In other words, an ATL suit is not just aimed at reducing existing pollution levels in the industrialized nations, but it is also aimed at thwarting investment

239 Restatement (Second) of Torts § 177 (1959).

240 Natural resource damage suits are beyond the scope of this chapter.

decisions that would send future pollution rates soaring in the developing world. Sixth, ATL suits in developing countries are crucial for addressing the reforestation and agricultural practices that make up the 'drawdown' component of the scientific prescription for returning the atmosphere to 350 ppm equilibrium. As noted earlier, such practices must be implemented worldwide in order to achieve the 100 GtC necessary for a return to 350 ppm. Developing countries are situated to protect their forests, reforest their logged lands, and implement soil practices in the short term even if their transition to a zero-carbon economy will occur over a much longer term. Also, for nations with significant deforestation pressures, the ATL suits are crucial to enjoin further logging. And finally, ATL suits in developing nations may seek orders requiring the governments of those countries to plan adaptation strategies for climate disruption. While adaptation plans do not directly achieve carbon reduction, they spotlight the irrevocable damage that climate change will bring. By necessarily detailing the global heating differences associated with different levels of carbon in the atmosphere, adaptation plans of developing countries may fortify aggressive mitigation efforts in the industrialized world, as wealthy countries see the consequences of a world hurtling towards climate chaos. Moreover, these adaptation plans will likely present a platform of equity that may advance diplomatic efforts to hold industrialized nations accountable for their fair share of climate recovery.

Conclusion

As the planet approaches climate points of no return, trial attorneys and community lawyers across the globe should unite in a worldwide legal movement to hold recalcitrant governments responsible for reducing greenhouse gas emissions. Atmospheric trust litigation is a high-stakes, high-yield strategy that offers three crucial features currently missing from any other approach. First, it galvanizes a sheer moral force that eludes most procedure-laden, highly technical, statutes. The atmosphere is an endowment to which today's children, as well as remote future generations, have a legitimate moral and legal claim as beneficiaries. Government's failure to safeguard this priceless asset amounts to gross breach of fiduciary duty and, ultimately, generational theft. Second, the trust framework overhauls government's posture from one based on political discretion (allowing officials to ignore the problem) to one based on strict fiduciary obligation (requiring government to protect crucial public property assets belonging in common to the citizens). Third, the trust framework brings a new conceptual macro-approach to a global problem that embroils virtually every nation on Earth. By defining the atmosphere as common property, the trust positions all nations of the world in a logical relationship towards each other and towards their common atmosphere. Specifically, this approach:

1. yields a carbon reduction pathway tied to planetary atmospheric requirements (nature's own laws);
2. characterizes an atmospheric fiduciary obligation incumbent on all sovereigns; and
3. packages the scientific prescription for carbon reduction in a way that lends itself to enforcement in the domestic courts of the world's sovereigns.

Such a macro approach is essential in order to solve the problem on the level that it presents itself. Statutory approaches, which are micro in nature, present a dangerous risk of failing to conceptualize, much less address, atmospheric pollution in its entirety. The trust approach appeals to domestic courts to apply the force of law in singular yet orchestrated and coherent fashion to protect global common property – the atmosphere – that belongs to the present and future generations of the planet.

Inevitably, atmospheric trust litigation will be criticized on the basis that it invites courts to overstep their function and intrude into a matter best left to the political branches. If the world could rewind several years of time, that criticism would carry far more weight. But after two futile international climate treaty negotiations in the past five years and the refusal of most polluting nations to pass meaningful domestic legislation, climate crisis screams out for a reality check.²⁴¹ Children born in 1992, the year nations of the world signed the UNFCCC, have arrived at adulthood with no meaningful action to protect their planet – and their future survival. Withering droughts in Australia and Africa; infernos in Greece and California; devastating floods in Pakistan, India, and the American Midwest; ferocious hurricanes on the Gulf Coast; searing heat waves in Russia and France; melting glaciers in Montana, Tibet, Alaska, Chile, and Argentina; thawing polar icecaps and permafrost; worldwide ocean acidification; and the tortuous impending drowning of island-nations across the planet – these all portend a future unfolding because governments worldwide have abdicated their most fundamental duty to safeguard the natural inheritance held in sovereign trust for all generations. As the Secretary General of the United Nations warned the world in 2009: 'Climate change is happening. The evidence is all around us. And unless we act, we will see catastrophic consequences The time for hesitation is over'.²⁴² Given the stakes of planetary heating for the youth alive today, much less their future children, one would expect legislatures and agencies worldwide to respond with emergency haste to climate crisis, rendering litigation altogether unnecessary. Instead, political leaders and governing institutions around the world still push the world on a deadly Business as Usual course. Having squandered any further opportunity

241 Over two decades have passed since the United States Congress was notified by the nation's leading climate scientist that, with 99 per cent confidence, the planet was warming dangerously due to human-caused greenhouse gas pollution, yet Congress has still failed to act to control one of the largest national shares of global pollution. See Hansen (2009), p. xv.

242 See Ban Ki-moon (2009).

for slow, incremental policy, the political branches still demonstrate a shocking reticence to the threat of runaway heating that imperils all of humanity. Courts are a last resort – but a resort nonetheless.

Atmospheric trust litigation challenges lawyers and judges to take fundamental principles of public trust law and apply them in coherent fashion in a new and urgent context so as to arrive at a uniform, quantifiable measure of governmental responsibility to reduce carbon. At a time in history when thinkers worldwide are calling for new, innovative technologies and practices to address climate crisis, lawyers should pioneer promising, if untested, legal constructs to address carbon loading of the atmosphere. Ultimately, the public trust doctrine and the primordial rights that infuse it are part of a populist manifesto that surfaces through the generations of Humanity, no less revolutionary for our time and our crisis than was the forcing of the Magna Carta on the English monarchy in 1215,²⁴³ or Mahatma Gandhi's great Salt March to the sea in 1930.²⁴⁴ The difference between those great struggles and the present crisis is one of global scale, mind-blowing urgency, and the unthinkable consequences of failure to future generations. By bringing an orchestrated campaign of public trust lawsuits in countries throughout the world, lawyers may gather the most powerful elements of public property rights into one revolutionary global legal movement that not only forces governmental protection of the atmosphere but also catalyses citizen environmental democracy and advances universal human rights.

There should be no doubt that judges have it well within their ability to issue decisions forcing carbon reduction. In past eras, judges have called forth logic and principled reasoning to formulate law in response to unprecedented circumstances. As Justice Holmes wrote, the common law is '[t]he felt necessities of the times'.²⁴⁵ The power of equity to provide relief is formidable, described by Justice Story in his famous treatise as that 'admirable intervention of judicial polity, which interposes preventative guards against impending dangers and mischiefs, and which does not [wait] until the destructive blow has been dealt'.²⁴⁶ Judges in many civil law systems have analogues that can carry powerful trust principles forward

243 The Magna Carta is often cited as a source of the public trust doctrine, as it forced the monarchy to open access to resources such as navigable waterways. For discussion, see Cronin and Kennedy (1999), pp. 139–42.

244 The British had imposed a heavy tax on salt and exercised a monopoly over its production and sale. The common people were forbidden from collecting salt, which was vital for preservation and other needs. Cast in public trust terms, the British government fully alienated an element of the public trust corpus to corporate interests. Gandhi rejected the British position forbidding the people from harvesting a natural resource and consequently led a non-violent march to the sea for the purpose of collecting salt. So many people were arrested that the jails overflowed and the British had to change the law and accept their right to collect salt. For a summary, see Lal (1949).

245 Holmes (1881), p. 1.

246 Story (1836), p. 203.

as well. As John Willard wrote in his *Treatise on Equity Jurisprudence*, 'Equity must have a place in each system of jurisprudence, in substance if not in name'.²⁴⁷

Unfortunately, after decades of modern environmental law, even many judges in common law systems are now so accustomed to issuing rulings within detailed confines of legislation or regulations that they may have lost an inclination to construct meaningful remedies using their powerful traditional prerogatives of equity. Nevertheless, history tells us that conditions of impossibility often inspire imagination and courage. The irrevocable damage associated with the climate tipping points is unprecedented, far beyond the ability of any future legislature to mitigate or repair. Handed the right complaint, there will no doubt be path-breaking judges who, no matter what their nationality, recognize this epochal moment in the course of human civilization and will exert their judicial authority to protect the globe's atmosphere – for the sake of not only their nation's citizens, but also for the many billions of people dependent on Earth's life systems for all time to come.

Postscript

As this chapter was going to press, Atmospheric Trust Litigation (ATL) materialized in a 'hatch' of lawsuits and petitions filed on behalf of youth plaintiffs simultaneously across the United States in the first week of May, 2011. The actions, co-ordinated by Our Children's Trust, consist of a federal lawsuit, nine state law suits, 39 petitions for state rule-making, and one notice of intent to sue – a legal campaign covering all 50 states in the US.²⁴⁸ Internationally, an ATL lawsuit was filed in Ukraine, with subsequent legal actions planned in other countries as well.²⁴⁹ The suits and petitions declared a sovereign atmospheric trust duty and called upon government to produce carbon accountings and plans for annual emissions reductions of at least six per cent (as well as to embark on reforestation and improved soil practices to achieve carbon drawdown from the atmosphere). The orchestrated legal actions calibrated the government's fiduciary obligation to the scientific prescription produced by Dr James Hansen and other scientists in early May 2011, which set a path for returning the planet to atmospheric equilibrium at 350 ppm by the end of the century through aggressive carbon emissions reduction, reforestation, and improved soil practices.²⁵⁰

247 Willard (1863), p. 38.

248 The complaints and petitions are compiled on the website of Our Children's Trust. See <http://www.ourchildrenstrust.org/legal-action/lawsuits> (lawsuits) and <http://www.ourchildrenstrust.org/legal-action/petitions> (petitions). For media coverage, see <http://www.ourchildrenstrust.org/media>.

249 The Ukraine complaint is posted at: <http://www.ourchildrenstrust.org/sites/default/files/Ukraine%20ATL%20English.pdf>.

250 See Hansen, et al. (2011).

This initial ‘hatch’ of ATL actions corresponded with 125 youth-led marches (called the ‘iMatter Marches’) in cities across the US and in countries around the world, from Kuwait to Nepal, to Pakistan, to Bangladesh. The youth marches were organized by a non-profit organization, Kids vs Global Warming.²⁵¹ Subsequent youth marches were planned for summer of 2011 in India, Ghana, Egypt, Mississippi, The Netherlands, England, Mexico City, and New York City, among many other locations.²⁵² Alec Loorz, the 16-year-old lead plaintiff in the federal ATL lawsuit and founder of *Kids v Global Warming*, explained the youth’s legal and social protest campaign in the following terms:

[A]s youth, we are the last group of people in the US who don’t have any official political rights. We can’t vote, [and] we certainly can’t compete with rich corporate lobbyists So we are forced to simply trust our government to make good decisions on our behalf However, it’s become clear that our government has failed us, by not protecting the resources on this planet we need to survive. Even though scientists overwhelmingly agree that CO₂ emissions are totally messing up the balance of our atmosphere, our leaders continue to turn their backs on this crisis.

The time has come for the youngest generation to hold our leaders accountable for their actions Today, I and other fellow young people are suing the government, for handing over our future to unjust fossil fuel industries, and ignoring the right of our children to inherit the planet that has sustained all of civilization. I will join with youth and attorneys in every state in the US to demand that our leaders live and govern as if our future matters.

The government has a legal responsibility to protect the future for our children. So we are demanding that they recognize the atmosphere as a commons that needs to be preserved, and commit to a plan to reduce emissions to a safe level.

The plaintiffs and petitioners on all the cases are young people. We are standing up for our future But we will not only stand up in the courts. We will stand up in the streets as well

This is a movement. A mass movement of young people standing up with a unified voice to tell the ruling generation that we will no longer just sit idly by as they make decisions that threaten our future. We matter. Our future matters.²⁵³

251 See <http://imattermarch.org/>.

252 See <http://imattermarch.org/>.

253 Why One 16-Year-Old Is Suing the US Government Over Climate Change (2011).

References

- (2007) 'Britain Proposes Bold Environmental Legislation That Could Pave Way for Post-Kyoto Pact', *International Herald Tribune*, 13 March, available at <http://www.iht.com/articles/ap/2007/03/13/europe/EU-GEN-Britain-Climate-Change.php>.
- (2008) *You Want Loopholes With That?*, available at <http://www.ecoequity.org/2010/08/you-want-loopholes-with-that-2/#more-812>.
- (2009) 'UN Scientist Backs "350" Target for CO₂ Reduction', *Yahoo! News*, 25 August.
- (2010) 'The Changing Climate For Environmental Legislation', *Newsweek*, available at <http://www.newsweek.com/blogs/the-gaggle/2010/08/31/the-changing-climate-for-environmental-legislation.html>.
- (2011) 'Why One 16-year-old is Suing the US Government Over Climate Change', *Guardian Environmental Network*, 5 May 2011, available at <http://www.guardian.co.uk/environment/2011/may/05/sueing-us-government-climate>.
- David Adam (2008) 'World Carbon Dioxide Levels Highest for 650,000 Years, Says US Report', *The Guardian*, 13 May 2008, at 16, available at <http://www.guardian.co.uk/environment/2008/may/13/carbonemissions/climatechange>.
- Adell Amos (2008) 'Freshwater Conservation in the Context of Energy and Climate Policy: Assessing Progress and Identifying Challenges in Oregon and the Western United States', 12 *U. Denver. Water L. Rev.* 1, 52, 65 (2008).
- Thomas T. Ankersen (2003) 'Shared Knowledge, Shared Jurisprudence: Learning to Speak Environmental Law Creole (Criollo)', 16 *Tulane Env. L. J.* 807.
- Hope M. Babcock (2009) 'The Public Trust Doctrine: What a Tall Tale They Tell', 61 *S. C. L. Rev.* 393.
- Paul Baer, Tom Athanasiou, Sivan Kartha and Eric Kemp-Benedict (2008) *The Greenhouse Development Rights Framework 2d*, available at <http://www.ecoequity.org/docs/TheGDRsFramework.pdf>.
- Paul Baer, Tom Athanasiou and Sivan Kartha (2009) *A 350 ppm Emergency Pathway: A Greenhouse Development Rights Brief*, available at <http://gdrights.org/wp-content/uploads/2009/11/a-350-ppm-emergency-pathway-v2.pdf>.
- Ban Ki-moon (2009) 'Statement of, Secretary-General of the United Nations on the United Nations Environment Programme', *Climate Change Science Compendium II*, available at http://www.unep.org/pdf/ccScienceCompendium2009/cc_ScienceCompendium2009_full_en.pdf.
- Peter Barnes (2006) *Who Owns the Sky: Our common assets and the future of capitalism*, Island Press.
- (2004) *Black's Law Dictionary 1477* (8th edn).
- Michael C. Blumm and Brett M. Swift (1998) 'The Indian Treaty Piscary Profit and Habitat Protection in the Pacific Northwest: A Property Rights Approach', *Uni. Of Colorado Law Review*, available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=871518.

- Michael C. Blumm and Jane G. Steadman (2009) 'Indian Treaty Fishing Rights and Habitat Protection: The Martinez Decision Supplies a Resounding Judicial Affirmation', 49 *Nat. Res. J.* 653.
- George T. Bogert (1987) *Trusts*, 6th edn, West Pub. Co.
- John Boitnott (2008) 'Berkeley Scientists: World in 'Mass Extinction Spasm'—Scientists: Humans to Blame', *News Report NBC*, 12 August, available at <http://www.nbc11.com/news/17171725/detail.html>.
- City of Seattle (2006) *A Climate of Change: Meeting the Kyoto Challenge, Climate Action Plan Highlights*, available at http://www.seattle.gov/climate/docs/SeaCAP_summary.pdf.
- Craig Collins (2010) *Toxic Loopholes: Failures and Future Prospects for Environmental Law*, Cambridge University Press.
- Steve Connor (2007) 'The Earth Today Stands in Imminent Peril', *The Independent*, 19 June, available at http://environment.independent.co.uk/climate_change/article2675747.ece.
- Karl S. Coplan (2010) 'Public Trust Limits on Greenhouse Gas Trading Schemes: A Sustainable Middle Ground?' 35 *Columbia J. of Env. L.* 287.
- Robin Kundis Craig (2010) 'Adapting to Climate Change: The Potential Role of State Public Trust Doctrines', 34 *Vermont L. Rev.*
- John Cronin and Robert F. Kennedy (1999) *The Riverkeepers*, Scribner.
- Timothy P. Duane (2010) 'Greening the Grid: Implementing Climate Change Policy Through Energy Efficiency, Renewable Portfolio Standards, and Strategic Transmission Systems', 34 *Vermont L. Rev.* 711.
- Harrison Dunning (1989) 'The Public Trust: A Fundamental Doctrine of American Property Law', 19 *Envtl. L.* 515.
- Paul Finn (1995) 'A Sovereign People, A Public Trust, in P. Finn (ed.), *Essays on Law and Government*, Law Book Co.
- Lisa Friedman (2010) 'US Bound by Obama's Copenhagen Emissions Pledge — U.N. Official', *Greenwire*, 10 January 2010, available at <http://www.nytimes.com/gwire/2010/01/20/20greenwire-us-bound-by-obamas-copenhagen-emissions-pledge-17687.html>.
- Ross Gelbspan (2004) *Boiling Point: How Politicians, Big Oil and Coal, Journalists, and Activists Have Fueled a Climate Crisis—And What We Can Do to Avert Disaster*, Basic Books.
- Ross Gelbspan (2007) 'Beyond the Point of No Return', 11 December, *Grist*, available at <http://www.grist.org/article/beyond-the-point-of-no-return/>.
- Jennifer Gleason and Bern Johnson (1995) 'Environment Laws Across Borders', 10 *J. Envntl. L. & Litig.* 67.
- Robert Glicksman (2008) 'Sustainable Federal Land Management, Protecting Ecological Integrity and Preserving Environmental Principle', 44 *Tulsa L. J.* 147.
- Dale D. Goble and Eric T. Freyfogle (2002) *Wildlife Law, Cases and Materials*, West.

- Suzanne Goldenberg, John Vidal and Jonathan Watts (2009) 'Leaked UN Report Shows Cuts Offered at Copenhagen Would Lead to 3C Rise', *The Guardian*, available at <http://www.guardian.co.uk/environment/2009/dec/17/un-leaked-report-copenhagen-3c>.
- Jeff Goodell (2006) *Big Coal: The Dirty Secret Behind America's Energy Future*, Houghton Mifflin Harcourt.
- Al Gore (2007) 'Moving Beyond Kyoto', *N.Y. Times*, 1 July.
- Matt Gouras (2008) 'Judge: Ag Undersecretary Avoids Jail Time', *Associated Press*, available at http://hosted.ap.org/dynamic/stories/b/bush_official_contempt?site=ap§ion=home&template=default&ctime=2008-02-28-00-41-37.
- Douglas L. Grant (2001) 'Underpinnings of the Public Trust Doctrine: Lessons from Illinois Central Railroad', 48 *Ariz. St. L.J.* 849.
- James Hansen (2006a) 'Climate Change: On the Edge', *The Independent*, 17 February, available at <http://environmentindependent.co.uk/article345926.ece>.
- James Hansen (2006b), 'The Threat to the Planet', *The N.Y. Rev. of Books* 12, 13 July, available at <http://www.nybooks.com/articles/19131>.
- James Hansen (2007a) 'Why We Can't Wait', *The Nation*, 7 May.
- James Hansen (2007b), 'Dangerous Human-Made Interference with Climate – Testimony Before Select Committee on Energy Independence and Global Warming', US House of Representatives 5, 26 April, available at http://www.columbia.edu/~jeh1/testimony_26april2007.pdf.
- James Hansen (2008a) 'Twenty Years Later: Tipping Points Near on Global Warming', *The Huffington Post*, 23 June, available at http://www.huffingtonpost.com/dr-james-hansen/twenty-years-later-tippin_b_108766.html.
- James Hansen (2008b) 'Tipping Point: A Perspective of a Climatologist', 2008–09 *State of the Wild*, available at http://www.columbia.edu/~jeh1/2008/StateOfWild_20080428.pdf.
- James Hansen (2009) *Storms of My Grandchildren: The Truth About the Coming Climate Catastrophe and Our Last Chance to Save Humanity*, Bloomsbury.
- James Hansen et al. (2007a) 'Climate Change and Trace Gases', 365 *Phil. Trans. R. Soc. A*, 1925, 1949, available at <http://www.planetnetwork.net/climate/Hansen2007.pdf>.
- James Hansen et al. (2007b) 'Dangerous Human-Made Interference With Climate: A GISS Model Study', 7 *Atmos. - Phys.* 2287, 2303, available at <http://www.atmos-chem-phys.net/7/2287/2007/acp-7-2287-2007.pdf>.
- James Hansen et al. (2008) 'Target Atmospheric CO₂: Where Should Humanity Aim?', 2 *The Open Atmospheric Sciences Journal* 217, available at <http://arxiv.org/abs/0804.1126>, and at http://www.columbia.edu/~jeh1/2008/TargetCO2_20080407.pdf.
- James Hansen et al. (2011) 'The Case for Young People and Nature: A Path to a Healthy, Natural, Prosperous Future', draft available at http://www.columbia.edu/~jeh1/mailings/2011/20110505_CaseForYoungPeople.pdf.
- Richard G. Hildreth, David R. Hodas, Nicholas A. Robinson, James Gustave Speth (2010) *Climate Change Law: Mitigation and Adaptation*, West.

- O. W. Holmes, (1881) *The Common Law*, Dover Books.
- E. Hopkins (1896) *Handbook on the Law of Real Property*, Law Book Exchange.
- David Hunter, Chris Wold and Melissa Powers (2009) *Climate Change and the Law*, Matthew Bender.
- Robert F. Kennedy Jr (2005) *Crimes Against Nature: How George W. Bush and His Corporate Pals Are Plundering the Country and Hijacking Our Democracy*, Harper Perennial.
- Jennifer Koons (2008) 'Following Pa. Mining Town's Example, Ecuador OKs Constitution Giving Rights to Nature', *Greenwire*, 30 September, available at <http://celdf.org/article.php?id=185>.
- Laura H. Kosloff and Mark C. Trexler (2007) *Consideration of Climate Change in Facility Permitting*, in Michael B. Gerrard (ed.), *Global Climate Change*, American Bar Association.
- Hanno Kube (1997), 'Private Property in Natural Resources and the Public Weal in German Law – Latent Similarities to the Public Trust Doctrine?', 37 *Natural Resources Journal* 857.
- Jan G. Laitos, Sandra B. Zellmer, Mary C. Wood and Dan H. Cole (2006) *Natural Resources Law*, Thompson West.
- Vinay Lal (1949) *Dandi, Salt March: History and Politics*, Manas, available at <http://www.sscnet.ucla.edu/southasia/History/Gandhi/Dandi.html>.
- Gregory M. Lamb (2007) 'A Key Threshold Crossed', *Christian Sci. Monitor*, 11 October, available at <http://www.csmonitor.com/2007/1011/p11s01-wogi.html> (quoting climate scientist Tim Flannery).
- Geoffrey Lean (2007) *A World Dying, But Can We Unite to Save It?*, *The Independent*, UK, 18 November, available at <http://www.independent.co.uk/environment/climate-change/a-world-dying-but-can-we-unite-to-save-it-400847.html>.
- Jeffery J. Matthews (1999) 'Clean Water Act Citizen Suit Requests for Municipal Moratoria: Anatomy of a Sewer Hookup Moratorium Law Suit', 14 *J. Envtl. L. & Litig.* 25.
- Michael McCarthy (2009) 'Carbon cuts Only Give 50/50 Chance of Saving Planet', *The Independent*, UK, 9 March.
- Bill McKibben (2007) 'Remember This: 350 Parts Per Million', *Washington Post*, 28 December, available at <http://www.washingtonpost.com/wp-dyn/content/article/2007/12/27/AR2007122701942.html>.
- Thomas W. Merrill (2005) 'Global Warming as a Public Nuisance', 30 *Colum. J. Env. L.* 293.
- Vincent Mulier (2006) 'Recognizing the Full Scope of the Right to Take Fish Under the Stevens Treaties: The History of Fishing Rights Litigation in the Pacific Northwest', 31 *Am. Indian L. Rev.* 41.
- Ved P. Nanda and William K. Ris, Jr (1976) 'The Public Trust Doctrine: A Viable Approach to International Environmental Protection', 5 *Ecol. L. Q.* 291.
- President Nasheed (2009) 'UN Scientist Backs "350" Target for CO₂ Reduction', *High Level Conference on Climate Change: Technology*

- Development and Transfer*, New Delhi, India, 22 October, available at <http://www.newdelhicctechconference.com/InauguralSession/Speech-PresidentofMaldives.pdf>.
- Patrick Parenteau (2010) *Come Hell And High Water: Coping with the Unavoidable Consequences of Climate Disruption*, available at: http://www.vjel.org/docs/Parenteau_Water_Draft.pdf.
- Fred Pearce (2007) *With Speed and Violence: Why Scientists Fear Tipping Points in Climate Change*, Beacon Press 2007.
- Jona Razzaque (2001) 'Case Law Analysis: Application of Public Trust Doctrine in Indian Environmental Cases', 13 *J. Envtl. L.* 221.
- Restatement (Second) of Torts §821B (1959).
- Restatement (Second) of Trusts § 177 (1959).
- J. W. Rockström, W. Steffen, K. Noone, Å. Persson, F. S. Chapin III, E. Lambin et al. (2009a) 'Planetary Boundaries: Exploring the Safe Operating Space for Humanity', 14 *Ecology and Society* 2.
- J. W. Rockstrom, W. Steffen, K. Noone et al. (2009b) 'A Safe Operating Space for Humanity', *Nature* 461, September.
- Joseph Romm (2008a) 'Study: Water-Vapor Feedback is "Strong and Positive", So We Face "Warming of Several Degrees Celsius"', *Climate Progress Blog*, available at <http://climateprogress.org/2008/10/26/study-water-vapor-feedback-is-strong-and-positive-so-we-face-warming-of-several-degrees-celsius>.
- Joseph Romm (2008b) *Is 450 ppm (or less) Politically Possible? Part 0: The Alternative is Humanity's Self-Destruction*, available at <http://climateprogress.org/2008/04/26/is-450-ppm-or-lesspolitically-possible-part-0-the-alternative-is-humanitys-self-destruction>.
- Elizabeth Rosenthal (2007) 'UN Chief Seeks More Climate Change Leadership', *The New York Times*, 18 November, available at <http://www.nytimes.com/2007/11/18/science/earth/18climatenew.html?>
- Elizabeth Rosenthal (2010) 'Britain Curbing Airport Growth to Aid Climate', *The New York Times*, 1 July, available at <http://www.nytimes.com/2010/07/02/science/earth/02runway.html?emc=eta1>.
- Peter H. Sand (2004) 'Sovereignty Bounded: Public Trusteeship for Common Pool Resources?', 4 *Global Envtl. Politics* 47.
- Joseph L. Sax (1970) 'The Public Trust Doctrine in Natural Resource Law: Effective Judicial Intervention', 68 *Mich. L. Rev.* 471.
- Joseph William Singer (1997) *Property Law: Rules, Policies, and Practices*, 2nd edn, Little, Brown and Co.
- Joseph William Singer (2006) *Property Law: Rules, Policies, and Practices*, 4th edn, Little, Brown and Co.
- George P. Smith II and Michael W. Sweeney (2006) 'The Public Trust Doctrine and Natural Law: Emanations Within a Penumbra', 33 *B.C. Envtl. Aff. L. Rev.* 307.

- Susan Solomona et al. (2009) 'Irreversible Climate Change Due to Carbon Dioxide Emissions', 106 *Proc Nat'l. Acad. Sci. U.S.* 1704 (Jan. 28, 2009), available at <http://www.pnas.org/content/106/6/1704.full.pdf+html?sid=819c1042-fab1-4dce-88c7-e2c118f0f904>.
- James Gustave Speth (2008) *The Bridge at the End of the World: Capitalism, the Environment, and Crossing from Crisis to Sustainability*, Yale University Press.
- David Spratt and Philip Sutton (2008) 'Climate Code Red: The Case for a Sustainability Emergency', *Friends of the Earth*, available at <http://www.climatecodedred.net/>.
- Jan S. Stevens (1980) 'The Public Trust: A Sovereign's Ancient Prerogative Becomes the People's Environmental Right', 14 *U.C. Davis. L. Rev.* 195.
- William B. Stoebuck and Dale A. Whitman (2000) *The Law of Property*, 3rd edn.
- Joseph Story (1836) *Commentaries on Equity Jurisprudence: as Administered in England and America*, Hilliard Gray and Co.
- David Takacs (2008) 'The Public Trust Doctrine, Environmental Human Rights, and the Future of Private Property', 16 *NYU Env'tl. L. J.* 711.
- The University of New South Wales Climate Change Research Centre (2009) *The Copenhagen Diagnosis: Updating the World on the latest Climate Science*, available at <http://www.copenhagendiagnosis.org/>.
- Gerald Torres (2002) 'Who Owns the Sky?', 19 *Pace Env'tl. L. Rev.* 515.
- Mary Turnipseed, Raphael Sagarin, Peter Barnes, Michael C. Blumm, Patrick Parenteau and Peter H. Sand (2010) 'Reinvigorating the Public Trust Doctrine: Expert Opinion on the Potential of a Public Trust Mandate in US and International Environmental Law', 52 *Environment Magazine* 5.
- United States Department of Commerce (NOAA, Earth System Research Laboratory) (2008) *Annual Greenhouse Gas Index 2008*, available at http://www.esrl.noaa.gov/news/quarterly/summer2009/2008_greenhouse_gas_index.html.
- Union of Concerned Scientists (2007) 'How to Avoid Dangerous Climate Change: A Target for US Emissions Reduction', available at http://www.ucsusa.org/assets/documents/global_warming/emissions-target-report.pdf.
- United States Global Change Research Program (2009) *Global Climate Change Impacts in the United States*, available at <http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts/full-report>.
- John Vidal, Allegra Stratton and Suzanne Goldenberg (2009) 'Low Targets, Goals Dropped: Copenhagen Ends in Failure', *The Guardian*, 19 December, available at <http://www.guardian.co.uk/environment/2009/dec/18/copenhagen-deal>.
- John Vidal (2011) 'Bolivia Enshrines Natural World's Rights with Equal Status for Mother Earth', *The Guardian*, 10 April, available at <http://www.guardian.co.uk/environment/2011/apr/10/bolivia-enshrines-natural-worlds-rights>.
- W. Walsh (1947) *Commentaries on the Law of Real Property*, M. Bender.

- Jonathan Watts (2010) 'India discloses Carbon Emissions for First Time Since More Than a Decade', *The Guardian*, 25 May, available at <http://www.guardian.co.uk/environment/2010/may/25/india-carbon-emissions>.
- Edith Brown Weiss (1984) 'The Planetary Trust: Conservation and Intergenerational Equity', 11 *Ecology. L.Q.* 495.
- John Willard (1863) *A Treatise of Equity Jurisprudence*, Platt Potter.
- Charles F. Wilkinson (1989) 'The Headwaters of the Public Trust: Some of the Traditional Doctrine', 19 *Envtl. L. Rev.* 425.
- M. C. Wood (1998) 'Reclaiming the Natural Rivers: The Endangered Species Act Applied to Endangered River Ecosystems', 40 *Ariz. L. Rev.* 197.
- M. C. Wood (2000) 'The Tribal Property Right to Wildlife Capital (Part I): Applying Principles of Sovereignty to Protect Imperilled Wildlife Populations', 37 *Idaho L. Rev.* 1.
- M. C. Wood (2006) 'Restoring the Abundant Trust: Tribal Litigation in Pacific Northwest Salmon Recovery', 36 *Envtl. L. Rep.* 10163.
- M. C. Wood (2007) 'Nature's Trust: A Legal, Political and Moral Frame for Global Warming', 34 *Boston College Env'tl Affairs L. Rev.* (May 2007), available at <http://www.law.uoregon.edu/faculty/mwood/docs/legal.pdf>.
- M. C. Wood (2008), 'A Framework of China-US Partnership to Address Global Warming', 3 *China Environmental and Resource Law Review*, Ocean University (Renmin Press), available at <http://www.law.uoregon.edu/faculty/mwood/docs/china08.pdf>.
- M. C. Wood (2009a) 'Atmospheric Trust Litigation', in William C. G. Burns and Hari M. Osofsky (eds), *Adjudicating Climate Change: Sub-national, National, and Supranational Approaches*, Cambridge University Press.
- M. C. Wood (2009b) 'Advancing the Sovereign Trust of Government to Safeguard the Environment for Present and Future Generations (Part I): Ecological Realism and the Need for a Paradigm Shift', 39 *Env'tl. L.* 43.
- M. C. Wood (2010a) "'You Can't Negotiate With a Beetle": Environmental Law for a New Ecological Age', 50 *NAT. RES. L. J.*
- M. C. Wood (2011 forthcoming) *Nature's Trust: Environmental Law for a New Ecological Age*, Cambridge University Press.
- World Resources Institute (2005) *Climate Analysis Indicator Tool*, available at <http://cait.wri.org/>.
- Victor John Yannacone Jr (1975) 'Agricultural Lands, Fertile Soils, Popular Sovereignty, The Trust Doctrine, Environmental Impact Assessment and the Natural Law', 51 *North Dakota L. Rev.* 615.
- Alan Zarembo (2007) 'Kyoto's Failures Haunt New UN Talks', *L.A. Times*, 3 December, available at <http://articles.latimes.com/2007/dec/03/science/sci-kyoto3>.

Cases

- 1.58 Acres of Land*, 523 F Supp 120 (D Mass 1981)
- Action Mfg Co v Simon Wrecking Co*, 428 F Supp 2d 28 (ED Penn 2006)
- Alaska Ctr for the Env't v Browner*, 20 F3d 981 (9th Cir 1994)
- Alliance to Protect Nantucket Sound Inc v Energy Facilities Siting Board*, 457 Mass. 663 (Mass S Ct 2010)
- American Motorcyclist Ass'n v Watt*, 543 F Supp 789 (C D Cal, 1982)
- Anders v Meredith*, 1839 WL 525 (NC 1839)
- Arizona Center For Law In Public Interest v Hassell*, 837 P2d 158 (Ariz App Div 1 1991)
- Arnold v Mundy*, 6 NJL 1 (NJ 1821)
- Baxley v Alaska*, 958 P2d 422 (Alaska 1998)
- British Columbia v Canadian Forest Products*, 2004 SCC 38
- Burlington Northern & Santa Fe Ry v United States*, 129 S Ct 1870 (2009)
- California v. General Motors Corp.*, 2007 WL 2726871 (ND Cal 2007) (settled on appeal)
- Center for Biological Diversity v FPL Group*, 2008 WL 4255789 (Cal App 1 Dist, Sept 18, 2008)
- Chosar Corp v Owens*, 370 SE2d 305 (Va 1988)
- Cobell v Kempthorne*, 455 F3d 317 (DC Cir 2006)
- Cobell v Norton*, 240 F3d 1081 (DC Cir 2001)
- Cobell v Norton*, 283 F Supp 2d 66 (D DC 2003)
- Coeur D'Alene Tribe v Asarco Inc*, 280 F Supp 2d 1094 (D Id 2003)
- Coleman v Schwarzenegger*, 2009 WL 2430820 (ED Cal 2009)
- Comer v Murphy Oil Co.*, No. 05-CV-436L Q (SD Miss, 20 Aug., 2007), rev'd in part, 585 F3d 855 (5th Cir 2009), judgement vacated, rehearing en banc granted, subsequently dismissed (for lack of quorum), 607 F.3d 1049 (5th Cir 2010)
- Connecticut v American Electric Power*, 406 F Supp 2d 265 (SD NY 2005), rev'd, 582 F3d 309 (2nd Cir 2009), cert granted, 131 S Ct 813 (2010)
- Ctr. for Biological Diversity v Nat'l Highway Traffic Safety Admin*, 508 F.3d 508 (9th Cir 2008)
- Daubert v Merrill Dow Pharmaceuticals, Inc*, 509 US 579 (1993)
- Evans v Little*, 271 SE 2d 138 (Ga 1980)
- Fomento Resorts and Hotels Ltd v Minguel Martins*, Civil Appeal Nos 4154 (S Ct India 2000)
- Fraser v Southeast First Bank of Jacksonville*, 417 So2d 707 (Fla App 1982)
- Garber v Whittaker*, 174 A 34 (Super Ct Del 1934)
- Geer v Connecticut*, 161 US 519 (1896)
- Green Mountain Chrysler v Crombie*, 508 F. Supp 2d 295, 313–17 (D Vermont 2007)
- Her Majesty v City of Detroit*, 874 F2d 332 (6th Cir 1989)
- Hill v Ground*, 114 Mo App 8, 343, 9 SW 343 (Ct App Mo 1905)
- Idaho ex rel Evans v Oregon*, 462 US 1017 (1983)

- Illinois Cent. R. Co. v Illinois*, 146 US 387 (1892)
- Juan Antonio Oposa v Fulgencio S Factoran, Jr*, GR No 101083 (Sup Ct Phil 1993)
- Just v Marinette County*, 201 NW2d 761 (Wis 1972)
- Karnataka Industrial Areas Development Board v C Kenchappa*, AIRSCW 2546 (India 2006)
- Lake Michigan Federation v United States Army Corps of Engineers*, 742 F Supp 441 (N D Ill 1990)
- Lane County Audubon Soc'y v Jamison*, 958 F2d 290, 294 (9th Cir 1992)
- M. Builders Pv. Ltd v Radhey Shyam Sahu and Others*, 1999 6 SC 464, AIR 1999 SC 2468
- M. C. Mehta v Kamal Nath*, 1997 1 SCC (1997)
- Marks v Whitney*, 491 P2d 374 (Cal 1971)
- Massachusetts v Environmental Protection Agency*, 549 US 497 (2007)
- Massachusetts v US Environmental Protection Agency*, 127 S Ct 1438 (2007)
- Matthews v Bay Head Improvement Assoc*, 471 A2d 355 (N J 1984)
- M. C. Mehta v Kamal Nath and Others*, 34 (1997 1 SCC 388), WP 182/1996 (2000.05.12)
- Moore v Philips* 627 P2d 831 (Kan. App., 1981)
- National Audubon Society v Superior Court of Alpine County*, 658 P2d 709 (Cal 1983)
- Native Village of Kivalina v Exxon Mobil Corp.*, 663 F Supp 2d 863 (ND Cal, 2009) (appeal pending)
- NEDC v Owens Corning Corporation*, 434 F Supp 2d 957 (D Or 2006)
- Nelsen v Griffiths*, 585 P2d 840 (Wash App 1978)
- Oregon Natural Desert Assn v Singleton*, 75 F Supp 2d 1139
- Pacific Rivers Council v Thomas*, 30 F3d 1050 (9th Cir 1994)
- Puget Sound Gillnetters Ass'n v U S Dist Court*, 573 F 2d 1123 (9th Cir 1978)
- Re Estate of Ehlers*, 911 P2d 1017 (Wash App 1996)
- Re Water Use Permit Applications, Waihole Ditch Combined Contested Case Hearing*, 94 Haw 97, 9 P3d 409 (Haw 2000)
- Reliance Natural Resources Ltd v Reliance Industries Ltd*, Civil Appeal No. 4273 of 2010, (S Ct India 2010)
- Robinson v Ariyoshi*, 65 Haw 641, 674, 658 P2d 287 (Haw 1982)
- S. Burlington County, NAACP v Township of Mount Laurel (Mt Laurel I)*, 336 A2d 713 (NJ 1975)
- Simon Wrecking Company*, 428 F Supp 2d 288 (ED Penn. 2006)
- Southern Burlington County, NAACP v Township of Mount Laurel*, 336 A2d 713 (NJ 1975)
- Southern Burlington County, NAACP v Township of Mount Laurel*, 456 A2d 390 (NJ 1983)
- State ex. Rel. Town of Westerly v Bradley*, 877 A2d 601, (RI 2005)
- State of Ariz v State of Cal*, 373 US 546 (1963)
- State of Ga v Tennessee Copper Co*, 206 US 230 (1907)
- State v City of Bowling Green*, 313 NE2d 409 (Ohio 1974)

- Th. Majra Singh v Indian Oil Corporation*, AIR 1999 J&K 81
- Thomas v Peterson*, 753 F2d 754 (9th Cir 1975)
- United States v Metropolitan Dist Comm'n*, 757 F Supp 121 (D Mass 1991)
- United States v Washington*, 2007 US Dist LEXIS 61850 *23 (WD Wash. 2007)
- United States v Washington*, 384 F Supp 312 (WD Wash 1974)
- United States v Washington*, 520 F2d 685 (9th Cir 1975)
- United States v White Mountain Apache Tribe*, 537 US 465, (2003)
- United States v Washington*, 384 F Supp 312, (WD Wash 1974)
- US v 1.58 Acres of Land*, 523 F Supp 120, (D Mass 1981)
- US v Oregon*, 913 F 2d 576 (9th Cir 1990)
- US v Washington*, 384 F Supp312 (WD Wash 1974)
- Waihole Ditch* 94 Haw 97, 130–31 (Haw 2000)
- Washington v Washington State Commercial Passenger Fishing Vessel Ass'n*, 443 US 658 (1979)
- Waweru v Republic*, Misc. Civil Application No. 118 of 2004, at 689 (High Court, at Nairobi, March 2, 2006), available at <http://www.chr.up.ac.za/index.php/browse-by-subject/339-kenya-waweru-v-republic-2007-ahr-149-keh-2006-.html>.
- Weinberger v Romero-Barcelo*, 456 US 305 (1982)
- White v Smyth*, 214 SW2d 967 (Tex 1948)
- Willmon v Koyer*, 143 P 694 (Cal 1914)
- Zuch v Conn. Bank & Trust Co*, 500 A2d 565 (Conn App 1985)

Legislation

- 106 Proc. Nat'l Acad. Sci. U.S. 1704.
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. § 9601 (2006).
- Haw. Const., art. XI, §1.
- India Const. Part III, art. 21.
- Kenya Const.
- Kyoto Protocol to the United Nations Framework Convention on Climate Change, Dec. 10, 1997, 37 I.L.M. 32.
- Louisiana. Const., art. IX, §1.
- Oregon. Rev. Stat. Ann. § 540.140.
- R.I. Const., art. I, §16.
- S. Afr. Const. 1996 §24.
- UNFCCC, S. Treaty Doc. No. 102–38, Art. 3.
- Const. of Ukraine, art. 13.
- United Nations Framework Convention on Climate Change, Copenhagen Accord, FCCC/CP/2009/L.7 (18 Dec., 2009).