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ATMOSPHERIC TRUST LITIGATION ACROSS THE WORLD[1]

Mary Christina Wood
Philip H. Knight Professor of Law
Faculty Director, Environmental and Natural Resources Law Program
University of Oregon School of Law[2]

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 hasn't occurred on Earth for sixty-five million years.[5] Should business as usual continue even for a few more years, future humanity for untold generations will be pummeled 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

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[1] This article has adapted portions of the following works: MARY CHRISTINA WOOD, NATURE'S TRUST: ENVIRONMENTAL LAW FOR A NEW ECOLOGICAL AGE (Cambridge University Press, forthcoming Spring 2012); Mary Christina Wood, *Atmospheric Trust Litigation*, *in* ADJUDICATING CLIMATE CHANGE: SUB-NATIONAL, NATIONAL, AND SUPRANATIONAL APPROACHES 99 (William C.G. Burns & Hari M. Osofsky, eds., Cambridge University Press 2009); Mary Christina Wood, *Atmospheric Trust Litigation*, *in* CLIMATE CHANGE READER 1018 (W.H. Rodgers, Jr. and M. Robinson-Dorn, eds., Carolina Academic Press, forthcoming 2010).

[2] Research assistance was provided by John Mellgren, J.D. 2011, Bowerman Fellow in the Environment and Natural Resources Law Program, University of Oregon School of Law.

[3] James Hansen et al., *Climate Change and Trace Gases*, 365 PHIL. TRANS. R. SOC. A, 1925, 1949 (2007) *available at* http://www.planetwork.net/climate/Hansen2007.pdf [hereinafter *Climate Change and Trace Gases*]. *See also* Steve Connor, *The Earth Today Stands in Imminent Peril*, THE INDEPENDENT, June 19, 2007, *available at* http://environment.independent.co.uk/climate_change/article2675747.ece.

[4] James Hansen, *The Threat to the Planet*, THE N.Y. REV. OF BOOKS 12, July 13, 2006, *available at* http://www.nybooks.com/articles/19131.

[5] John Boitnott, *Berkeley Scientists: World in 'Mass Extinction Spasm'— Scientists: Humans to Blame*, NEWS REPORT NBC, Aug. 12, 2008, *available at* http://www.nbc11.com/news/17171725/detail.html.

[6] *See generally* CLIMATE CHANGE SCIENCE COMPENDIUM II, United Nations Environment Programme (2009) *available at* http://www.unep.org/pdf/ccScienceCompendium2009/cc_ScienceCompendium2009_full_en.pdf

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]

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

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(statement of Ban Ki-moon, Secretary-General of the United Nations: "Climate change is happening. 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."); I. Allison et al., *The Copenhagen Diagnosis: Updating the world on the Latest Climate Science*, UNIVERSITY OF SOUTH WALES CLIMATE CHANGE RESEARCH CENTER (Nov. 2009), *available at* http://www.ccrc.unsw.edu.au/Copenhagen/Copenhagen_ Diagnosis_LOW.pdf ; GLOBAL CLIMATE CHANGE IMPACTS IN THE UNITED STATES (Thomas R. Karl, Jerry M. Melillo, and Thomas C. Peterson, eds., 2009), *available at* http://downloads.globalchange.gov/usimpacts/pdfs/ climate- impacts-report.pdf; *see also* Geoffrey Lean, *A World Dying, But Can We Unite to Save It*? THE INDEPENDENT UK, (Nov. 18, 2007) http://www.independent.co.uk/environment/climate-change/a-world-dying-but-can-we-unite-to-save-it-400847.html.

[7] *See* Joseph Romm, *Is 450 ppm (or less) Politically Possible? Part 0: The Alternative is Humanity's Self-Destruction*, CLIMATE PROGRESS (Apr. 26, 2008), http://thinkprogress.org/romm/2008/04/26/202588/is-450-ppm-or-less-politically-possible-part-0-the-alternative-is-humanitys-self-destruction/.

[8] FRED PEARCE, WITH SPEED AND VIOLENCE: WHY SCIENTISTS FEAR TIPPING POINTS IN CLIMATE CHANGE 239 (Beacon Press 2007); *see also* Al Gore, *Moving Beyond Kyoto*, N.Y. TIMES at 413 (, July 1, 2007) *available at http://www.nytimes.com /2007/07/01/opinion/01gore.html?pagewanted=all* ("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.").

[9] *See* PEARCE, *supra* note 8; DAVID SPRATT & PHILIP SUTTON, CLIMATE CODE RED: THE CASE FOR A EMERGENCY ACTION (2008), [hereinafter CLIMATE CODE RED] (summarizing science); CLIMATE CHANGE SCIENCE COMPENDIUM II, *supra* note 6, at ii (statement of Ban Ki-moon, Secretary-General of the United Nations: "[T]his report shows that climate change is accelerating at a much faster pace than was preciously 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."). The Ninth Circuit in a recent climate case has recognized the tipping point concept. *See* Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin., 508 F.3d 508, at slip op. 34 (9th Cir. 2008) ("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')).

[10] *See* James Hansen, *Dangerous Human- Made Interference with Climate, Testimony Before Select Committee on Energy Independence and Global Warming*, *U.S. House of Representatives*, 5 (April 26, 2007) [hereinafter Hansen, *Testimony*], *available at* http://www.columbia.edu/~jeh1/testimony_26april2007.pdf ("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, *The Threat to the Planet, supra* note 4, at 14 ("[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., *Climate Change and Trace Gases, supra* note 3, at 1925, 1949 (discussing positive feedback loops); James Hansen *et al., Dangerous Human-Made Interference With Climate: A GISS Model Study*, 7 ATMOS. CHEM. PHYS. 2287, 2303 (2007), *available at* http://www.atmos-chem-phys.net/7/2287/2007/acp-7-2287-2007.pdf [hereinafter *Dangerous Human-Made Interference*](discussing tipping point: "[W]e must be close to such a point, but we may not have passed it yet.").

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 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

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[11] *See* Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin., 508 F.3d 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 U.S. 579 (1993).

[13] *See* James Hansen, et al., *Target Atmospheric CO_2: Where Should Humanity Aim?* 2 OPEN ATMOSPHERIC SCIENCES JOURNAL 217 (Nov. 2008), *available at http://www.columbia.edu/~jeh1/2008/TargetCO2_20080407.pdf*; *see* Bill McKibben, *Remember This: 350 Parts Per Million*, WASHINGTON POST.COM (Dec. 28, 2007), http://www.washingtonpost.com/wp-dyn/content/article/2007/12/27/AR2007122701942.html [hereinafter Hansen et al., *Target Atmospheric CO_2*]; *UN Scientist Backs '350' Target for CO2 Reduction,* YAHOO! NEWS (Aug. 25, 2009) (on file with author).

[14] David Adam, *World Carbon Dioxide Levels Highest for 650,000 Years, Says US Report*, THE GUARDIAN (May 13, 2008) at 16, *available at* http://www.guardian.co.uk/environment/2008/may/13/carbonemissions/climatechange. While the 350 ppm target has been exceeded, climate scientists still offer hope of atmospheric stability if the "overshoot" is brief. *See* Hansen, *Testimony*, *supra* note 10, abstract ("If the present overshoot of this target CO2 is not brief, there is a possibility of seeding irreversible catastrophic effects.").

[15] *See* Hansen, *Testimony*, *supra* note 10, at 12 ("[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."); James Hansen, *Why We Can't Wait*, THE NATION (May 7, 2007), http://www.thenation.com/article/why-we-cant-wait ("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 . . ."); James Hansen, *Climate Change: On the Edge*, THE INDEPENDENT, (Feb. 17, 2006) http://environmentindependent.co.uk/article345926.ece ("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* Gregory M. Lamb, *A Key Threshold Crossed*, CHRISTIAN SCI. MONITOR (Oct. 11, 2007) http://www.csmonitor.com/2007/1011/p11s01-wogi.html (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] *See* CLIMATE CODE RED, *supra* note 9, at ch. 23, 24.

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 levels. This may well be due to the fossil fuel industry's influence over political leaders, economies, and governmental systems world-wide.[18] While such political dynamics are too complex to explore here, exclusive reliance on the political branches for climate response now seems ill-advised.

This chapter explains a legal strategy called Atmospheric Trust Litigation (ATL)[19] that calls upon the judicial branches of governments world-wide to force carbon reduction on the basis of their fiduciary responsibility to protect the public trust. ATL seeks to accomplish, though 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 U.S., 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 in Section I by describing government inaction world-wide and explaining the need for a swift legal strategy to hold sovereigns accountable for their pollution. Section II explains the public trust doctrine, which provides the basis for ATL. Section III describes the elements of an ATL claim and a remedy that would provide effective redress for government's recalcitrance. Section IV 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.

I. Governmental Inaction

In December 2009, nations of the world gathered in Copenhagen, Denmark for the

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[17] Elizabeth Rosenthal, *U.N. Chief Seeks More Climate Change Leadership*, N.Y. TIMES.COM (Nov. 18, 2007), http://www.nytimes.com/2007/11/18/science/earth/18climatenew.html?scp=1&sq=UN%20Panel:%20avert%20climate%20disaster&st=cse.

[18] *See generally*, ROSS GELBSPAN, BOILING POINT: HOW POLITICIANS, BIG OIL AND COAL, JOURNALISTS, AND ACTIVISTS HAVE FUELED A CLIMATE CRISIS – AND WHAT WE CAN DO TO AVERT DISASTER (2004); JEFF GOODELL, BIG COAL: THE DIRTY SECRET BEHIND AMERICA'S ENERGY FUTURE (2006)

[19] For additional materials on ATL, see *supra* note 1.

[20] United Nations Framework Convention on Climate Change (1992), *available at*: http://unfccc.int/resource/docs/convkp/conveng.pdf. [hereinafter UNFCCC] *See also UNFCCC, Fact sheet: An Introduction to the United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol*, *available at* http://unfccc.int/press/fact_sheets/items/4978.php.

[21] U.S. CONST., art. VI.

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 U.S., 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 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 U.S., for example, remains a recalcitrant global polluter, having offered only a meager reduction proposal at the Copenhagen Conference. Though the U.S. emits nearly 16 percent of the world's global greenhouse gases,[25] President Obama expressed a willingness to reduce U.S. greenhouse gas emissions by only 17 percent (below 2005 levels) by 2020.[26] His choice of a 2005 baseline made the pledge appear far larger than it was – 17 percent equates to only a 2 percent decline over 1990 levels.[27] Moreover, President Obama made the U.S. position contingent on the passage of energy legislation before the U.S. 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, negotiated in 1997, which included a broad range of signatories, and

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[22] United Nations Framework Convention on Climate Change, *Copenhagen Accord*, FCCC/CP/2009/L.7 (Dec. 18, 2009), *available at* http://unfccc.int/resource/docs/2009/cop15/eng/l07.pdf [hereinafter UNFCCC, *Copenhagen*]; for commentary, *see* John Vidal, Allegra Stratton & Suzanne Goldenberg, *Low Targets, Goals Dropped: Copenhagen Ends in Failure,* THE GUARDIAN (Dec. 19, 2009), available at http://www.guardian.co.uk/environment/2009/dec/18/copenhagen-deal.

[23] UNFCCC, *Copenhagen, supra* note 22.

[24] *See* Suzanne Goldenberg, John Vidal & Jonathan Watts, *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. 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: "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!). Tom Athanasiou, *You Want Loopholes With That?* (Aug. 11, 2010) *available at* http://www.ecoequity.org/2010/08/you-want-loopholes-with-that-2/#more-812 (emphasis in original).

[25] World Resources Institute, Climate Analysis Indicator Tool (2005), http://cait.wri.org/ (includes land-use change & forestry).

[26] Lisa Friedman, *U.S. Bound by Obama's Copenhagen Emissions Pledge -- U.N. Official*, GREENWIRE (Jan. 10, 2010), http://www.nytimes.com/gwire/2010/01/20/20greenwire-us-bound-by-obamas-copenhagen-emissions-pledge-17687.html.

[27] Timothy P. Duane, *Greening the Grid: Implementing Climate Change Policy Through Energy Efficiency, Renewable Portfolio Standards, and Strategic Transmission Systems,* 34 VT. L. REV. 711, 716-17, n. 16 (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, Jan. 28, 2010, *available at* http://www.usclimatenetwork.org/resource-database/us-inscription-to-the-unfccc-on-the-copenhagen-accord; *see also infra* note 29.

which contained numerical emissions reduction targets, largely failed.[29] The U.S., 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 U.S., 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 U.S. 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 U.S., 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 U.S. 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 major engines of

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[29] Kyoto Protocol to the United Nationals Framework Convention on Climate Change, Dec. 10, 1997, 37 I.L.M. 32.
[30] Alan Zarembo, *Kyoto's Failures Haunt New UN Talks*, L.A. TIMES (Dec. 3, 2007), *available at* http://articles.latimes.com/2007/dec/03/science/sci-kyoto3.
[31] Daniel Stone, *The Changing Climate For Environmental Legislation*, NEWSWEEK (Aug. 31, 2010), *available at* http://www.newsweek.com/blogs/the-gaggle/2010/08/31/the-changing-climate-for-environmental-legislation.html.
[32] *Id.*
[33] *See* Karl S. Coplan, *Public Trust Limits on Greenhouse Gas Trading Schemes: A Sustainable Middle Ground?* 35 COLUM. J. OF ENVTL. L. 287, 329-333 (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* RICHARD G. HILDRETH, ET AL., CLIMATE CHANGE LAW: MITIGATION AND ADAPTATION (2010); DAVID HUNTER, CHRIS WOLD, & MELISSA POWERS, CLIMATE CHANGE AND THE LAW (2009).
[35] *See* Mary Christina Wood, *"You Can't Negotiate With a Beetle": Environmental Law for a New Ecological Age*, 50 NAT. RES. L. J. 167 (Winter 2010); Mary Christina Wood, *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 ENVTL. L. 43 (March 2009) [hereinafter Wood, *Advancing the Sovereign Trust Part I*]; ROBERT F. KENNEDY JR., CRIMES AGAINST NATURE: HOW GEORGE W. BUSH AND HIS CORPORATE PALS ARE PLUNDERING THE COUNTRY AND HIJACKING OUR DEMOCRACY 32-33 (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* CRAIG COLLINS, TOXIC LOOPHOLES: FAILURES AND FUTURE PROSPECTS FOR ENVIRONMENTAL LAW (2010); *see also* JAMES GUSTAVE SPETH, THE BRIDGE AT THE END OF THE WORLD: CAPITALISM, THE ENVIRONMENT,

environmental destruction: two-thirds of the greenhouse gas pollution in the U.S. is emitted pursuant to 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 to address 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 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 responsibilities. The seeds of the public trust doctrine are evident in legal systems world-wide and accessible to lawyers across the globe.

AND CROSSING FROM CRISIS TO SUSTAINABILITY 84 (2008).

[37] Laura H. Kosloff & Mark C. Trexler, *Consideration of Climate Change in Facility Permitting*, *in* GLOBAL CLIMATE CHANGE 259, 259 (Michael B. Gerrard ed., 2007).

[38] In the U.S., states and private parties have brought climate nuisance actions against major carbon polluters. In Connecticut v. Am. Elec. Power Co., 406 F. Supp. 2d 265 (S.D. 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 U.S. Supreme Court. For additional nuisance actions, see California v. General Motors Corp., 2007 WL 2726871 (N.D. Cal 2007) (*settled on appeal*); Comer v. Murphy Oil Co., No. 05-CV-436L Q (SD Miss. Aug. 20, 2007), *rev'd in part*, 585 F.3d 855 (5th Cir 2009), *judgment vacated, rehearing en banc granted, subsequently dismissed* (for lack of quorum), 607 F.3d 1049 (5th Cir 2010); Native Village of Kivalina v. Exxon Mobil Corp., 663 F. Supp. 2d 863 (N.D. 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 §821B.

[39] For sources and materials on the public trust doctrine, see JAN G. LAITOS, ET AL., NATURAL RESOURCES LAW, Chapter 8.II (2006). For discussion of the public trust doctrine, see Joseph L. Sax, *The Public Trust Doctrine in Natural Resource Law: Effective Judicial Intervention*, 68 MICH. L. REV. 471, 558- 66 (1970); Harrison Dunning, *The Public Trust: A Fundament al Doctrine of American Property Law*, 19 ENVTL. L. 515 (1989); Wood, *Advancing the Sovereign Trust (Part I)*, *supra* note 35.

II. 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 U.S. 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 Justinian*[44] and the Magna Carta. It manifests in 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

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[40] *See* Ill. Cent. R.R. Co. v. Illinois, 146 U.S. 387, 455 (1892); Ariz. Ctr. for Law in the Pub. Interest v. Hassell, 837 P.2d 158, 169 (Ariz. Ct. App. 1991) ("The beneficiaries of the public trust are not just present generations but those to come.").

[41] Geer v. Connecticut, 161 U.S. 519, 533–34 (1896).

[42] *See id.* at 533–34 (1896)(legislature as trustee); Ctr. for Biological Diversity v. FPL Group, 2008 W.L. 4255789, slip op. at 6, 8 (Cal. App. 1 Dist, Sept. 18, 2008) (discussing public trust obligations of "public agencies"); *In re* Water Use Permit Applications, Waihole Ditch Combined Contested Case Hearing, 9 P.3d 409, 446 (Haw. 2000) (applying public trust obligations to state agency).

[43] M.C. Mehta v. Kamal Nath, 1997 1 S.C.C. (1997), at ¶ 34, *cited in* David Takacs, *The Public Trust Doctrine, Environmental Human Rights, and the Future of Private Property,* 16 N.Y.U. ENVTL. L. J. 711 (2008), at n. 135-37 and accompanying text.

[44] *See* J. INST. 1.2.1, 2.1.1 (T. Sandars trans. 1st Am. ed. 1876) *discussed in* Ariz. Ctr. For Law In Pub. Interest v. Hassell, 837 P.2d 158, 166 (Ariz. App. Div. 1 1991); U.S. v. 1.58 Acres of Land, 523 F. Supp. 120, 122 (D. Mass. 1981); KENNEDY, *supra* note 35, at 20-21 (stating that the Institutes 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 infra*, section II.C.

a famous 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]

A. 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 U.S. context at both the federal and state levels, though nearly all cases in the U.S. have involved the states (not surprisingly, because the states were 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 U.S. Supreme Court declared that legislatures may not repudiate, abridge, or surrender their trust obligation:

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[46] Sax, *supra* note 39 at 484.

[47] *See* Douglas L. Grant, *Underpinnings of the Public Trust Doctrine: Lessons from Illinois Central Railroad,* 48 ARIZ. ST. L.J. 849 (2001) (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] *In re* Water Use Permit Applications, Waihole Ditch Combined Contested Case Hearing, 9 P.3d 409, 432-22 (Haw. 2000). *See also* Jan S. Stevens, *The Public Trust: A Sovereign's Ancient Prerogative Becomes the People's Environmental Right*, 14 U.C. DAVIS. L. REV. 195, 196 (1980) (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, *supra* note 33, at 311.

[50] *See* discussion at Mary Turnipseed, et al., *Reinvigorating the Public Trust Doctrine: Expert Opinion on the Potential of a Public Trust Mandate in U.S. and International Environmental Law*, ENV'T MAGAZINE vol. 52, no. 5, at 10 (Sept./Oct. 2005) (remark of Patrick Parenteau: "[N]o one has forced the issue at the national level in the way that it has been pushed at the state level.").

[51] United States v. 1.58 Acres of Land, 523 F. Supp. 120, 124 (D. Mass. 1981).

[52] *See, e.g.,* Coplan, *supra* note 33, at 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* Robert Glicksman, *Sustainable Federal Land Management, Protecting Ecological Integrity and Preserving Environmental Principle*, 44 TULSA L. J. 147 (2008).

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

> 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 U.S. Supreme Court said in *Geer v. Connecticut*:

> [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 U.S. 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 alienated . . .[57]

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

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[54] Ill. Cent. R.R. Co. v. Illinois, 146 U.S. 387, 453 (1892).

[55] Turnipseed et al., *supra* note 50, at 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, *supra* note 43, at 711.

[56] Geer v. Connecticut, 161 U.S. 519, 529 (1896). *See also* Lake Mich. Fed'n v. U.S. Army Corps of Eng'rs, 742 F. Supp. 441, 445 (D. Ill. 1990) ("the public trust is violated when the primary purpose of a legislative grant is to benefit a private interest.").

[57] *Illinois Central,* 146 U.S. 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." *Id.* at 453.

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]

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 case 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 notable 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

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[58] *See, e.g., Geer*, 161 U.S. 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 N.E.2d 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] GEORGE T. BOGERT, TRUSTS, 6th Ed. (West Pub. Co., 1987) § 99 at 358; *see also* 76 AM. JUR. 2D TRUSTS § 656 (noting the "power, and a duty of the trustee, to initiate actions . . . for the protection of the trust estate"); 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] *See* Wood, *Advancing the Sovereign Trust Part I*, *supra* note 35, at notes 30-32.

[61] Moore v. Philips, 627 P.2d 831, 834 (Kan. Ct. App. 1981); BOGERT, *supra* note 59, § 99, at 358; 76 AM. JUR. 2D TRUSTS, *supra* note 59, §§ 331, 404 (a trustee "must not suffer the estate to waste or diminish, or fall out of repair.").

[62] *See e.g.* Hill v. Ground, 343, 9 S.W. 343, 343 (Mo. Ct. App. 1905).

[63] JOHN WILLARD, A TREATISE ON EQUITY JURISPRUDENCE 151, 379 (1855).

[64] Arnold v. Mundy, 6 N.J.L. 1, 49 (N.J. 1821); *see* discussion in Coplan, *supra* note 33, at 325.

[65] Coplan, supra note 33, at 325; *see also id.* at 324 ([T]he sovereign, as trustee, may distribute the income of public trust assets, but may not sell off the corpus.").

[66] RESTATEMENT 2D OF TRUSTS, § 200 (if a trustee of a term for years threatens to commit waste, the remainderman can maintain a suit to enjoin him).

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 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. The trust principle provides explicit protection to future beneficiaries. As Professor Karl S. 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.

B. 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

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[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 U.S. 465, 475 (2003).

[68] *In re* Water Use Permit Applications, Waihole Ditch Combined Contested Case Hearing, 9 P.3d 409, 455 (Haw. 2000). "Res" refers to the assets in the trust.

[69] Coplan, *supra* note 33, at 328; *see also* 76 AM. JUR. 2D TRUSTS 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 P.2d 374, 380 (Cal. 1971) ("In administering the trust the state is not burdened with an outmoded classification favoring one mode of utilization over another."); *see generally* Charles Wilkinson, *The Headwaters of the Public Trust: Some of the Traditional Doctrine,* 19 ENVTL. L. 425 (1989) [hereinafter Wilkinson, *Headwaters*] (noting expansion).

[71] *See* Gerald Torres, *Who Owns the Sky?*, 19 PACE ENVTL. L. REV. 515, 533 (2002) ("Properly understood . . . the traditional rationale for the public trust doctrine provides a necessary legal cornerstone . . . to protect the public interest in the sky."); PETER BARNES, WHO OWNS THE SKY: OUR COMMON ASSETS AND THE FUTURE OF CAPITALISM (2006); Sax, *supra* note 39, at 556-57 (urging application of doctrine to "controversies involving air pollution"); Mary Christina Wood, *Nature's Trust: A Legal, Political and Moral Frame for Global Warming*, 34 B.C. ENVTL AFF. L. REV. (May 2007), *available at http://www.law.uoregon.edu/faculty/mwood/docs/legal.pdf;* Coplan, *supra* note 33, at 317-322 ("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."); Patrick Parenteau, *Come Hell And High Water: Coping with the Unavoidable Consequences of Climate Disruption* (2009), *available at:* http://www.vjel.org/docs/Parenteau_Water_Draft.pdf; Robin Kundis Craig, *Adapting to Climate Change: The Potential Role of State Public Trust Doctrines*, 34 VT. L. REV. 781 (Spring 2010).

[72] Charles F. Wilkinson, *The Public Trust Doctrine in Public Land Law,* 14 U.C. DAVIS L. REV. 269, 315 (1980).

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]

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]

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[73] Ill. Cent. R.R. Co. v. Illinois, 146 U.S. 387, 452-456 (1892) (emphasis added); *see also id.* 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).

[74] *See* Matthews v. Bay Head Improvement Ass'n., 471 A.2d 355, 365 (N. J. 1984). (citation omitted).

[75] *See*, *e.g.*, Nat'l Audubon Soc'y v. Super. Ct. of Alpine Cnty., 658 P.2d 709, 719 (Cal. 1983) (non-navigable tributaries); Baxley v. Alaska, 958 P.2d 422, 434 (Alaska 1998) (wildlife); *Matthews*, 471 A.2d at 358 (dry sand area); Robinson v. Ariyoshi, 658 P.2d 287, 310 (Haw. 1982) (groundwater); Just v. Marinette County, 201 N.W.2d 761,769 (Wis. 1972) (wetlands).

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

[77] *See* Joseph Romm, *Study: Water-Vapor Feedback is "Strong and Positive," So We Face "Warming of Several Degrees Celsius,"* CLIMATE PROGRESS BLOG (OCT. 26, 2008), *available at* http://climateprogress.org/2008/10/26/study-water-vapor-feedback-is-strong-and-positive-so-we-face-warming-of-several-degrees-celsius. (a "warming of several degrees Celsius" = the end of life as we know it.")

[78] *See, e.g.,* Her Majesty v. City of Detroit, 874 F.2d 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, "[a]ll 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 . . ."); R.I. 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 A.2d 601, 606 (R.I. 2005)); Nat'l Audubon Soc'y v. Super. Ct. of Alpine Cnty., 658 P.2d 709, 720 (Cal. 1983) ("purity of the air" protected by the public trust).

[79] Comprehensive Environmental Response, Compensation, and Liability Act, 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 well cited public trust decision, *Geer v. Connecticut*, the U.S. 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 exploitation,[84] 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 [sic] 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 world-wide must draw upon timeless principles and extrapolate them in a 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 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

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[80] *See* Geer v. Connecticut*,* 161 U.S. 519, 525 (1896) ("These things are those which the jurisconsults called 'res communes' – the air, the water which runs in the rivers, the sea and its shores . . . [and] wild animals."). *See also* Torres, *supra* note 71, at 529-30 (discussing *res communes*).

[81] *See Geer*, 161 U.S. at 523.

[82] Georgia v. Tenn. Copper Co., 206 U.S. 230, 237 (1907). The passage was cited in Massachusetts v. E.P.A., 549 U.S. 497, 518-19 (2007).

[83] *See supra* note 44.

[84] Coplan, *supra* note 33, at 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] *Id.*

[86] Ill. Cent. R.R. Co. v. Illinois, 146 U.S. 387, 455 (1892).

litigation, modern courts have a solid legal rationale from which to draw in designating the atmosphere as a public trust asset.

C. 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 U.S., *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 U.S. 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]

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 the 535 A.D., 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 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

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[87] Juan Antonio Oposa v. Fulgencio S. Factoran, Jr., G.R. No. 101083 (Sup. Ct. Phil. 1993), *as excerpted in* LAITOS ET AL., *supra* note 39, at 441–44.

[88] For discussion of a natural law basis for the public trust, *see generally* George P. Smith II & Michael W. Sweeney, *The Public Trust Doctrine and Natural Law: Emanations Within a Penumbra,* 33 B.C. ENVTL. AFF. L. REV. 307 (2006); Victor John Yannacone, Jr., *Agricultural Lands, Fertile Soils, Popular Sovereignty, The Trust Doctrine, Environmental Impact Assessment and the Natural Law*, 51 N. D. L. REV. 615 (1975).

[89] Arnold v. Mundy, 6 N.J.L. 1, 11 (N.J. 1821).

[90] *Illinois Central*, 146 U.S. at 456. The same premise, deriving from natural law, found expression by the Supreme Court of Canada in a 2004 case, *Canadian Forest Products v. British Columbia*, 2004 S.C.R. 38 (2004). 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 . . . .". See id, ¶ 75 (citing de 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. . ." *Id*. at ¶ 76.

[91] KENNEDY, *supra* note 36, at 20-21 (noting that the *Institutes 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] J. INST. 1.2.1, 2.1.1 (T. Sandars trans. 1st Am. ed. 1876).

[93] *Id.* at 1.2.1, 2.1.1

[94] Wilkinson, *Headwaters, supra* note 70, at 429-31.

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 U.S. 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 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 Coplan notes that the public trust of the U.S. 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 landmark *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

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[95] *Id.* at 431.
[96] Coplan*, supra* note 33, at 311.
[97] *See* Takacs, *supra* note 43, at 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."); *see also id.* at 740-48 (describing South Africa regime); *see also* Thomas T. Ankersen, *Shared Knowledge, Shared Jurisprudence: Learning to Speak Environmental Law Creole (Criollo),* 16 TUL. ENVTL. L. J. 807, N. 27 (2003) (describing civil law analog to public trust doctrine in Latin America); Jennifer Gleason & Bern Johnson, *Environmental Law Across Borders*, 10 J. ENVTL. L. & LITIG. 67, 76 ("The public trust doctrine, having roots in ancient Roman law, appears in many legal systems.").
[98] JOSEPH STORY, COMMENTARIES ON EQUITY JURISPRUDENCE: AS ADMINISTERED IN ENGLAND AND AMERICA 733-734 (1866) (paraphrasing Lord Bacon).
[99] Paul Finn, *A Sovereign People, A Public Trust*, *in* ESSAYS ON LAW AND GOVERNMENT 15 (Law Book Co. 1995).
[100] Coplan, *supra* note 33, at 311.

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 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

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[101] Juan Antonio Oposa v. Fulgencio S. Factoran, Jr., G.R. No. 101083 (Sup. Ct. Phil. 1993), *as excerpted in* LAITOS, ET AL., *supra* note 39, at 443–44.

[102] *See* Jonathan Watts, *India discloses Carbon Emissions for First Time Since More Than a Decade*, THE GUARDIAN (May 25, 2010), *available at* http://www.guardian.co.uk/environment/2010/may/25/india-carbon-emissions.

[103] The Constitution of India was amended in 1976 to expressly address environmental quality. INDIA CONST. 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 INDIA CONST. 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." INDIA CONST. art. 21 states that "[n]o person shall be deprived of his life or personal liberty except according to procedure established by law").

[104] M.C. Mehta v. Kamal Nath and Others, (1997) 1 S.C.C. 388, ¶ 34 (India).

[105] *Id.*

[106] *See* Th. Majra Singh v. Indian Oil Corp., AIR 1999 J&K 81; M.I. Builders Pvt. Ltd. v. Radhey Shyam Sahu and Others, AIR 1999 SC 2468 (India); Karnataka Indus. Areas Dev. Board v. C. Kenchappa, 2006 AIR SCW 2546 (India); *see also* Jona Razzaque, *Case Law Analysis: Application of Public Trust Doctrine in Indian Environmental Cases*, 13 J. ENVTL. L., 221, 231 (2001).

heavily on cases and scholarship from the U.S.[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 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 pubic 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]

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

[108] Reliance Natural Resources Ltd. v. Reliance Industries Ltd., (2010) Civil Appeal No. 4273 of 2010, slip op at 125, ¶ 5 (S. Ct. India 2010), *available at,* http://www.legallyindia.com/images/stories/docs/cases/RIL_v_RNRL_supreme_court.pdf

[109] *Id*. at 132 ¶ 12

[110] Fomento Resorts and Hotels Ltd. v. Minguel Martins, Civil Appeal (2000), Nos. 4154, 107 at ¶ 32 (S. Ct India), *available at* http://www.elaw.org/node/3731. 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. . ." [110] Reliance Natural Resources Ltd. v. Reliance Industries Ltd., (2010) Civil Appeal No. 4273 of 2010, slip op at 200, ¶ 88 (S. Ct. India 2010), *available at,* http://www.legallyindia.com/images/stories/docs/cases/RIL_v_RNRL_supreme_court.pdf

[111] Reliance Natural Resources Ltd. v. Reliance Industries Ltd., (2010) Civil Appeal No. 4273 of 2010, slip op at 205-06, ¶ 9 (S. Ct. India 2010), *available at,* http://www.legallyindia.com/images/stories/docs/cases/RIL_v_RNRL_supreme_court.pdf.

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 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.*[115]

Citing favorably American law declaring a public trust, and noting that the public trust and *parens patriae* doctrines have supported successful U.S. 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

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[112] Fomento Resorts and Hotels Ltd. v. Minguel Martins, Civil Appeal (2000), Nos. 4154, at ¶ 32 (S. Ct India), *available at* http://www.elaw.org/node/3731 (emphasis added).
[113] B. C. v. Canadian Forest Prod., [2004] 2 S.C.R. 74, ¶ ¶ 64-83 (Can.), *available at* http://scc.lexum.umontreal.ca/en/2004/2004scc38/2004scc38.html.
[114] *Id.* at ¶ ¶ 71-81.
[115] *Id.* at ¶ 76.

of threats to the environment, [and] the existence or non-existence of enforceable fiduciary duties owed to the public by the Crown. . . ."[116] 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 the public trust for another time.[117] 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, perhaps because the nation finds itself still shackled by assumptions deriving from an oppressive colonial history that suppressed fiduciary expectations in governance. 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.[118] 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").[119] 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.[120] But while until recent times trust ideals have thus 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.[121]

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 honors fundamental assumptions of democracy. Indeed, a growing

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[116] *Id.* at ¶ ¶ 79-81.
[117] *Id.* at ¶ 82.
[118] Finn, *supra* note 99, at 10-11.
[119] *Id.* at 10.
[120] *Id.* at 11-12 ("[L]egal principle all but surrendered its place as a force defining the nature and end of government itself.").
[121] *Id.* at 15.

chorus of legal voices notes the commonality of public trust principles among nations and urges their application to vexing and unprecedented problems of global ecology.[122] 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.[123] 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.[124] 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.[125] 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 U.S. case, *Arnold v. Mundy*, ascribed the trust to an amalgamation of law, including the law of nature, civil law, and English common law.[126] By necessity, the doctrine has adapted and molded to new sovereign circumstances as nations have changed their governing character. As Professors Dale Goble and Eric Freyfogle note in their extensive analysis of the doctrine's transformation from England to the U.S., "[T]he doctrine of royal prerogative ownership of submerged lands 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."[127] At times in various countries, the public trust doctrine has rested

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[122] *See* Ved P. Nanda & William K. Ris, Jr., *The Public Trust Doctrine: A Viable Approach to International Environmental Protection,* 5 ECOL. L. Q. 291, 306 (1976) (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."); Peter Sand, *Sovereignty Bounded: Public Trusteeship for Common Pool Resources?*, GLOBAL ENVT'L POLITICS 4:1 47, 57-58 (Feb. 2004) (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); *see generally* Turnipseed et al, *supra* note 50.

[123] Finn, *supra* note 99 at 12.

[124] *Id.* at 12.

[125] *Id.* For an analysis of the public trust concept in German law, see Hanno Kube, *Private Property in Natural Resources and the Public Weal in German Law- Latent Similarities to Public Trust Law*, 37 NAT. RESOURCES J. 857, 860-862 (1997).

[126] Arnold v. Mundy, 6 N.J.L. 1, 76-77 (N.J. 1821). For an example of a modern case tracing the doctrine, *see* U.S. v. 1.58 Acres of Land, 523 F. Supp. 120, 122 (D. Mass. 1981) ("Public trust theory has its roots in the Roman law.").

[127] DALE D. GOBLE & ERIC T. FREYFOGLE, WILDLIFE LAW, CASES AND MATERIALS 294 (West 2002).

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."[128] South Africa now has one of the leading iterations of the doctrine world-wide.

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.[129] At many times in jurisprudential history, the doctrine has emerged from a 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."[130] 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 mold 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 ecological rights held by the people.[131] In fact, many nations have constitutional provisions that codify the trust precept.[132] Such statutory or constitutional

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[128] Takacs, *supra* note 43, at 743.

[129] Alliance to Protect Nantucket Sound, Inc. v. Energy Facilities Siting Board, Nos. SJC-10596, SJC-10578 (Mass. S.Ct. 2010), *available at* http://www.massreports.com/SlipOps/Default.aspx (Marshall, C.J., 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. . .").

[130] Ross Gelbspan, *Beyond the Point of No Return*, GRIST (Dec. 11, 2007), *available at* http://www.grist.org/article/beyond-the-point-of-no-return/.

[131] Takacs, *supra* note 43, 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.").

[132] South Africa, for example, ratified a constitution in 1996 that declares: "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 . . ." S. AFR. CONST. 1996 § 24 (emphasis added), cited in Takacs, *supra* note 43, at n. 154 and accompanying text. 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, March 2, 2006) *available at* http://www.chr.up.ac.za/index.php/browse-by-subject/339-kenya-waweru-v-republic-2007-ahrlr-149-kehc-2006-.html. ("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

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 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.[133] 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 world-wide 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

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that maintains a proper balance between the economic benefits of development with the needs of a clean environment."). In Ecuador, a Constitutional referendum adopted in 2008 gave inalienable rights of Nature to exist and persist and regenerate. *See* Jennifer Koons, *Ecuador OKs Constitution Giving Rights to Nature,* GREENWIRE (Sept. 30, 2008), *available at* http://celdf.org/article.php?id=185. In April, 2011, Bolivia was poised to pass a similar law set of laws, known as the Law of Mother Earth. See John Vidal, *Bolivia Enshrines Natural World's Rights with Equal Status for Mother Earth*, THE GUARDIAN (April 10 2011), *available at* http://www.guardian.co.uk/environment/2011/apr/10/bolivia-enshrines-natural-worlds-rights. Article 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 utilise 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.

UKRAINE CONST, art. 13.

[133] 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, *supra* note 43, at section III (discussing India and South Africa).

calling upon nations to "protect the climate system for the benefit of present and future generations of humankind."[134]

D. 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.[135] Property law arranges these 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."[136]

Courts have used the co-tenancy model on the sovereign level to describe shared interests to migrating salmon. In momentous Indian treaty litigation in the U.S., 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."[137]

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

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[134] United Nations Framework Convention on Climate Change, S. Treaty Doc. No. 102–38, art. 3, p. 1 (1992), *available at* http://unfccc.int/resource/docs/convkp/conveng.pdf.

[135] States that share a waterway, for example, have correlative rights to the water. *Arizona v. California*, 373 U.S. 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. Wash. State Commercial Passenger Fishing Vessel Ass'n*, 443 U.S. 658, 676-79 (1979). *See also Idaho ex rel. Evans v. Oregon*, 462 U.S. 1017, 1031 n.1 (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").

[136] BLACK'S LAW DICTIONARY 1477 (8th ed. 2004); Singer (1994); *see also* 20 AM. JUR. 2D *Cotenancy and Joint Ownership* § 1 (1995). .

[137] 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 cotenant and all citizens of the Territory (and later of the state) as the other."); United States v. Washington, 520 F.2d 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 cotenancy [sic] necessarily follow" as they would in the case of a co-tenancy in land. *Puget Sound*, 573 F.2d at 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.

waste.[138] 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:

> Cotenants 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 . . . 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.[139]

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.[140] This conception is reinforced by the UNFCCC, which essentially declares a commonly held atmospheric trust obligation.[141] 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.

III. 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.[142] 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

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[138] E. HOPKINS, HANDBOOK ON THE LAW OF REAL PROPERTY § 214, at 342 (1896); 2 W. WALSH, COMMENTARIES ON THE LAW OF REAL PROPERTY § 131, at 72 (1947).
[139] *See Washington*, 520 F.2d at 685.
[140] For the concept of a "planetary trust," *see* Edith Brown Weiss, *The Planetary Trust: Conservation and Intergenerational Equity*, 11 ECOL. L.Q. 495 (1984); Sand, *supra* note 122.
[141] United Nations Framework Convention on Climate Change, S. Treaty Doc. No. 102–38, art. 3, p. 1 (1992), *available at* http://unfccc.int/resource/docs/convkp/conveng.pdf.
[142] *See* Torres, *supra* note 71, at 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.

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 rather to police the other branches to ensure fulfillment of their trust responsibility in accordance with the climate imperatives of nature.[143] By linking to scientific prescriptions as the measure of fiduciary responsibility, the ATL approach is aimed at divesting the world's political leaders of their assumed prerogative to take action only according to their political objectives.

A. 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.[144] 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."[145]

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.[146] Even with 2 °C heating, scientists predict significant risk of intolerable impacts, such as the Greenland ice cap melting and a consequential rise in sea level that would displace millions of people world-wide.[147] 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.[148] Many vulnerable island states and African nations reject any 2 °C target, as such an increase would obliterate or devastate their nations. A

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[143] *See* Lake Mich. Fed'n v. U.S. Army Corps of Eng'rs, 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.").

[144] *See* Parenteau, *supra* note 71 at 2-3 (citing reports and explaining unavoidable heating); *see also* Dr. James Hansen, *Twenty Years Later: Tipping Points Near on Global Warming,* THE HUFFINGTON POST (June 23, 2008), http://www.huffingtonpost.com/dr-james-hansen/twenty-years-later-tippin_b_108766.html [hereinafter Hansen, *Twenty Years Later*].

[145] Susan Solomona et al., *Irreversible Climate Change Due to Carbon Dioxide Emissions*, 106 PROC. NAT'L ACAD. SCI. U.S. 1704, 1704 (Jan. 28, 2009), *available at* http://www.pnas.org/content/106/6/1704.full.pdf+html?sid=819c1042-fab1-4dce-88c7-e2c118f0f904, cited in Parenteau, *supra* note 71, at 3.

[146] Michael McCarthy, *Carbon cuts 'Only give 50/50 Chance of Saving Planet,'* THE INDEPENDENT (UK) (March 9, 2009), http://www.independent.co.uk/environment/climate-change/carbon-cuts-only-give-5050-chance-of-saving-planet-1640154.html

[147] I. ALLISON ET AL., *supra* note 6, at 49.

[148] JAMES HANSEN, STORMS OF MY GRANDCHILDREN: THE TRUTH ABOUT THE COMING CLIMATE CATASTROPHE AND OUR LAST CHANCE TO SAVE HUMANITY 13 (2009).

coalition of 112 nations now calls for a limit of 1.5 °C heating.[149] 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" to the planet[150] – which now appears to demand a limit of a 1.5 °C increase over preindustrial temperatures.[151] 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.[152]

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 ppm over the long term.[153] 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 CO_2 will need to be reduced from its current 385 ppm to at most 350 ppm."[154] The global average CO_2 concentration, which now exceeds *388 parts per million* – is the highest in 650,000 years of geologic history.[155] 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.[156] In the words of climate scientists, BAU will "loc[k] in

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[149] *See* Jamie Henn, *Countries for 150 ppm / 1.5 C*, 350.org., http://www.350.org/sites/all/files/Countries_Endorsing_350_ppm.pdf (last visited Nov. 7, 2011); *see also UN Scientist Backs '350' Target for CO2 Reduction*, YAHOO NEWS (Aug. 25, 2009) (on file with author). 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.

[150] *See* UNFCCC, *supra*, note 20, at art. 2.

[151] As James Hansen 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." Hansen, *Twenty Years Later, supra* note 144. 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." *Id.*

[152] *See* UNFCCC, *supra* note 20, at 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 . . . .").

[153] *UN Scientist Backs '350' Target for CO2 Reduction,* YAHOO! NEWS (Aug. 25, 2009) (on file with author); Hansen et al., *Target Atmospheric CO_2*, *supra* note 13, at 1; *see also* Johan Rockström et al., *Planetary Boundaries: Exploring the Safe Operating Space for Humanity*, ECOLOGY AND SOCIETY vol. 14, no. 2, art. 32 (2009) *available at* http://www.ecologyandsociety.org/vol14/iss2/art32/. For additional material and links, *see generally* the Stockholm Resilience Center website at http://www.stockholmresilience.org/research/researchnews/tippingtowardstheunknown.5.7cf9c5aa121e17bab42800021543.html (last visited Nov. 7, 2011).

[154] Hansen et al., *Target Atmospheric CO_2*, *supra* note 13, at 1.

[155] Anatta, NOAA, *Annual Greenhouse Gas Index,* ESRL QUARTERLY NEWSLETTER (Summer 2009), *available at* http://www.esrl.noaa.gov/news/quarterly/summer2009/2008_greenhouse_gas_index.html. This compares to a pre-Industrial revolution (1880) average of 280 ppm. *Id. See also* Parenteau, *supra* note 71.

[156] I. ALLISON ET AL., *supra* note 6, at 49.

climate change at a scale that would profoundly and adversely affect all of human civilization and all of the world's major ecosystems."[157]

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 U.S. Emissions Reductions*, which called for a 4% annual reduction in greenhouse gas emissions in the industrialized world starting in 2010.[158] 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% 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).[159] 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.[160] 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 CO_2 is no more than 350 ppm."[161]

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 6 percent in fossil fuel emissions, beginning in year 2013, would lower the atmospheric concentration of CO_2 to 350 ppm by the end of the century, assuming a corresponding major effort to extract roughly 100 Gigatons of CO_2 (GtC) from the atmosphere through reforestation and improved forestry and agricultural practices (they deemed 100 GtC the "largest practical extraction")[162] As some climate analysts have aptly describes, 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

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[157] *Id.*; *See also* Rockstrom, et al., *A Safe Operating Space for Humanity,* NATURE 461, 472-75 (Sept. 2009) (temperature increase of 6 °C "would severely challenge the viability of contemporary human societies.").

[158] UNION OF CONCERNED SCIENTISTS, HOW TO AVOID DANGEROUS CLIMATE CHANGE: A TARGET FOR U.S. EMISSIONS REDUCTION 14 (2007), *available at* http://www.ucsusa.org/assets/documents/global_warming/emissions-target-report.pdf [hereinafter UCS, TARGET].

[159] *See id.* at 3. A trustee must exercise "reasonable prudence" in managing trust assets. See BOGERT, *supra* note 59, at 366.

[160] Bill McKibben, *Remember This: 350 Parts Per Million,* WASHINGTON POST (Dec. 28, 2007) *available at* http://www.washingtonpost.com/wp-dyn/content/article/2007/12/27/AR2007122701942.html

[161] *See id.*

[162] James Hansen et al., *The Case for Young People and Nature: A Path to a Healthy, Natural, Prosperous Future*, (2011) *draft available at* http://www.columbia.edu/~jeh1/mailings/2011/20110505_CaseForYoungPeople.pdf. 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 10 percent a year, reach near-zero emissions by 2050, and lead to stabilization of atmospheric CO_2 concentrations of 350 ppm by 2100. Paul Baer, Tom Athanasiou & Sivan Kartha , *A 350 ppm Emergency Pathway: A Greenhouse Development Rights Brief* (Nov. 2009) at 1-4, *available at* http://gdrights.org/wp-content/uploads/2009/11/a-350-ppm-emergency-pathway-v2.pdf.

mobilization with few if any peacetime precedents. . . . ."[163]

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 percent probability of limiting global heating to 1.5 °C will look different than a path carrying a 90 percent 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.[164] 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.[165] 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.[166]

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.[167] 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.[168] The most feasible pathways remaining have a starting point of *now*.[169] Moreover, as many scientists warn, delay is dangerous, because it pushes the planet closer to the unknown

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[163] Baer, Anthanasiou & Kartha, *supra* note 162, at 4.

[164] *See id.* at 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 CO_2 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.)

[165] United States v. Washington, 384 F. Supp. 312, 343 (W.D. Wash. 1974). *See* discussion in Vincent Mulier, *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, n. 165 (2006), and accompanying text.

[166] *See Washington*, 384 F. Supp. at 346.

[167] I. ALLISON ET AL., *supra* note 6, at 51. See also UCS TARGET, *supra* note 158, at 2 (noting the "costs of delay are high," requiring accelerated emissions reductions.).

[168] *See* Baer, Anthanasiou & Kartha, *supra* note 162, at 4 *(*delineating a global carbon reduction trajectory to achieve 350 ppm, contemplating a peak in emissions in 2011 and a 10 percent 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 year.").

[169] I. ALLISON ET AL., *supra* note 6, at 51, fig. 22 (depicting different reduction trajectories based on start dates, but calibrating the 2C goal rather than 1.5, *see supra* note 153 and accompanying text).

tipping point.[170] Courts should adopt the recently developed 350 ppm scientific prescription – which calls for a global trajectory of 6 percent carbon emissions reduction beginning in 2013 (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.*[171]

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 time frame needed. No nation is equipped to adopt a significant orphan share left by another sovereign. Therefore, a bedrock principle of atmospheric trust liability must be the inexcusability of orphan shares and partial orphan shares.

B. 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.[172] In the U.S., for example, citizens are positioned to bring trust actions against their states or the federal government.[173] 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.[174] 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.

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[170] *See id.* at 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, STORMS OF MY GRANDCHILDREN, *supra* note 148, at 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* James Hansen, *Tipping Point: A Perspective of a Climatologist,* STATE OF THE WILD (2008-09) *available at* http://www.columbia.edu/~jeh1/2008/StateOfWild_20080428.pdf.

[171] *See infra* section III.C.

[172] *See* BOGERT, *supra* note 59, § 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.").

[173] Marks v. Whitney, 491 P.2d 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.

[174] 63C AM. JUR. 2D *Property* § 31; Chosar Corp. v. Owens, 370 S.E.2d 305 (Va. 1988) (co-tenants who allowed mining without consent of all other co-tenants were liable for waste); Anders v. Meredith, 1839 WL 525 (N.C. 1839); *see also supra* note 137 (discussing waste in context of sovereign co-tenancy in migrating fishery).

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 defense of many potential barriers.

C. 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 6 percent 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 output 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 U.S. and other industrialized nations) have contributed the lion's share of historic pollution; 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.[175] 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

[175] UNFCCC, *supra*, note 20, at art. 3, par. 1.

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.[176] As noted at the outset, it may well be that the task simply overwhelms international diplomacy.

Despite conventional assumptions favoring 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 cases, courts have determined the "fair share" of responsibility that various sovereign parties must assume relative to other parties[177] – 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."[178] And, as one famous treatise on equity observes, "Courts of Justice aim at practical good and general convenience rather than at theoretical perfection."[179] 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 U.S.) will not fully compensate for its total contribution to the pollution.[180] The reality should not deter courts. Carbon reduction must commence

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[176] *See* Paul Baer, et al., *The Greenhouse Development Rights Framework 2d*, 83-90 (2008), *available at* http://www.ecoequity.org/docs/TheGDRsFramework.pdf (analyzing international climate diplomacy).

[177] The "fair share" was a standard for the allocating fish between states and tribes in the Pacific treaty fishing cases, for example. *See generally* Michael C. Blumm & Jane G. Steadman, *Indian Treaty Fishing Rights and Habitat Protection: The Martinez Decision Supplies a Resounding Judicial Affirmation,* 49 NAT. RESOURCES. J. 653, 666 (2009). Courts also devised a "fair share" standard to reflect municipal obligations to meet regional low-income housing needs. *See* S. Burlington Cnty. N.A.A.C.P. v. Township of Mount Laurel, 336 A.2d 713, 724 (N.J. 1975) (municipality's fair share of the present and prospective regional need).

[178] United States v. Oregon 913 F. 2d 576, 580-81 (9th Cir. 1990).

[179] WILLARD, *supra* note 63, at 151.

[180] *See* Baer, et al., *The Greenhouse Development Rights Framework 2d*, *supra* note 176, 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, who are largely responsible for carbon pollution of the

immediately – further delay risks catastrophe. The fact that any one domestic court cannot solve the whole problem should not dissuade judges. As the U.S. Supreme Court emphasized in *Massachusetts v. EPA*, "[A plaintiff] need not show that a favorable decision will relieve his *every* injury."[181] 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 too 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.[182]

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 zero (or near-zero) carbon emissions to be achieved by a future date, most likely 2050.[183] Courts of various countries, then, must impose a timeline for reducing emissions with an endpoint that achieves near-zero emissions. Courts that shorten the time frame for achieving near-zero emissions will effectively impose a steeper curve of reduction.[184] While on one hand it may seem an inherently arbitrary task for a court to devise a time frame, on the other hand, courts do this all the time. In nearly every enforcement case, judges have to impose time frames 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.[185] The U.S. and China lead as the top two polluters in the world, each with about a 20 percent share.[186] The top ten polluters account for roughly two-thirds of the world's total carbon pollution.[187] Judges in those

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atmosphere. Needless to say, such nations would have to find ways of enforcing such monetary judgments 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.

[181] Massachusetts v. E.P.A., 549 U.S. 497, 525 (2007) citing Larson v. Valente, 456 U.S. 228, 224 n. 15 (1982).

[182] Nw. Envtl. Def. Ctr. v. Owens Corning Corp., 434 F. Supp. 2d 957, 968 (D. Or. 2006).

[183] *See Baer, Anthanasiou & Kartha*, *supra* note 162 at 1-4.

[184] By way of illustration, an 80 percent 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.

[185] *See* United Nations, Milleneium Development Goals Indicator, Carbon Dioxide Emissions (CO2), Thousand Metric Tons of CO_2 (CDIAC), *available at* http://mdgs.un.org/unsd/mdg/SeriesDetail.aspx?srid=749&crid= (last visited Nov. 7, 2011).

[186] 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/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 percent share, and the U.S. had nearly a 20 percent share. *Id.* The UN compiles detailed data on the greenhouse gas emissions of most countries of the world. *See* UNFCCC, *GHG Data from UNFCCC, available at* http://unfccc.int/ghg_data/ghg_data_unfccc/items/4146.php (last visited Nov. 7, 2011).

[187] *See List of Countries, supra* note 186.

countries should impose a particularly aggressive time frame 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 cleanup fund. The various liable parties would contribute money according to their equitable share.[188] 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 U.S. bears a colossal share of responsibility).

A third factor is the countries' "per capita emissions." This is the amount of carbon dioxide emitted on average by each person in the particular country.[189] 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.[190] India, on the other hand, produces only about 1.16 metric tons of carbon dioxide pollution per person on average.[191] Both nations are among the top five polluters of the planet (reflecting a huge population disparity between the two).[192] 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, all of which produce below 2 metric tons per capita.[193] On the far other end (along with the U.S.) 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.[194] These higher rates reflect both excessive consumption and capacity for dramatic reduction, both of which justify imposing a steep trajectory of carbon reduction.

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[188] 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, 433A (Apportionment of Harm to Causes); *see also* Burlington N. & 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, e.g.* Action Mfg. Co. v. Simon Wrecking Co., 428 F. Supp. 2d 28, 93-94 (E.D. Penn. 2006).

[189] *See List of Countries, supra*, note 186*; 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).

[190] *Id.*

[191] *Id.*

[192] *Id.*

[193] *See List of Countries, supra* note 186.

[194] *Id.*

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 of using critical public resources,[195] 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.[196] Courts faced with atmospheric trust litigation can, and should, make similar judgments. 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 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."[197] 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

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[195] *See, e.g.* Robinson v Ariyoshi, 65 Haw. 641, 674 (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.").

[196] *See*, *e.g.*, 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.'"); Adell Amos, *Freshwater Conservation in the Context of Energy and Climate Policy: Assessing Progress and Identifying Challenges in Oregon and the Western United States*, 12 U. DENV. WATER L. REV. 1, 52, 65 (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.")

[197] *See* Elizabeth Rosenthal, *Britain Curbing Airport Growth to Aid Climate,* THE NEW YORK TIMES (July 1, 2010) *available at* http://www.nytimes.com/2010/07/02/science/earth/02runway.html?emc=eta1

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 U.S.) 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 cooperating earlier.[198] The same approach may be suited to the climate context. The gross abdication of responsibility on the part of huge polluters like the U.S. has pushed the planet precariously close to the tipping point. There is little doubt that the failure of the industrialized nations to their its 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 world-wide 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 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.[199] 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.[200] 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).[201] 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.[202] "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.[203] "Capacity" is a more nuanced approach than mere per capita income average, because it "takes explicit account of the unequal distribution of

[198] *See, e.g.* Action Mfg. Co. v. Simon Wrecking Co., 428 F. Supp. 2d at 99-100 (noting availability of recalcitrance penalty but finding it not suitable for that case).
[199] *See generally* WILLARD, *supra* note 63, at 370 (describing different standards of waste between England and the United States).
[200] Baer, et al., *The Greenhouse Development Rights Framework 2d*, *supra* note 176.
[201] *Id*. at 16.
[202] *See id.* at 18 (but excluding emissions attributable to consumption below the development threshold).
[203] *See id.* at 16-17 (defining "capacity" as total national income excluding income below a "development threshold.").

income within countries."[204] 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."[205] Then, based on each nation's RCI, the report delineates individualized carbon reduction trajectories for each nation.[206] 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 the official principles of the [UNFCCC]."[207] 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 respect to the nations' individualized circumstances[208] and the globe's atmospheric needs (which may be re-defined as more scientific data emerges).[209]

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 judgments 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 as well as 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 U.S., there is a rich history of courts interpreting and enforcing broad treaty obligations as to natural resources shared between sovereigns. The remarkable 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*

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[204] *Id.* at 18.
[205] *Id.* at 17-19; *see also id.* at 93-98 (Table A1, presenting RCI for all countries).
[206] Baer, et al., *The Greenhouse Development Rights Framework 2d, supra* note 176, at 21-22, 76-79.
[207] *Id.* at 16.
[208] 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., *The Greenhouse Development Rights Framework 2d, supra* note 176, at 19.
[209] 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.

common with" with the non-Indian settlers.[210] 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 treaty promise that the U.S. 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 imperiled fish and the waterways that sustain them.[211] 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, U.S. 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.[212] 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 U.S. 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."[213]

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 causes dangerous stagnation in domestic response and threatens to draw standards down to the lowest common denominator. Atmospheric trust litigation breaks the mold by inviting judicial innovation in defining and enforcing carbon emissions reduction at the domestic level world-wide. Moreover, the global marker trajectory provides a baseline that offers a consistent starting point to this process.

D. Forms of Relief

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[210] *See* Blumm & Steadman, *supra* note 177, at 654 (citing treaty language) (emphasis added).
[211] *See id.* (describing treaty litigation as it moved into habitat protection); *see also* Michael C. Blumm & Brett M. Swift, *The Indian Treaty Piscary Profit and Habitat Protection in the Pacific Northwest: A Property Rights Approach,* 69 U. COLO. L. REV. 407 (1998).
[212] For background, *see* Blumm & Steadman, *supra* note 177.
[213] Massachusetts v. E.P.A., 549 U.S. 497, 500 (2007).

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.[214] As to the first, a declaratory judgment is a straightforward remedy that can greatly advance the task of clarifying responsibilities of governments worldwide in addressing climate crisis. A declaratory judgment 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; and 6) the fiduciary obligation calibrates to a scientific prescription for carbon reduction designed to restore global carbon dioxide levels to below 350 ppm.[215] 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.[216] Courts 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.[217] In the U.S., 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.

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[214] 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 Thomas W. Merrill, *Global Warming as a Public Nuisance*, 30 COLUM. J. ENVTL. L. 293 (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 Mary C. Wood, *A Framework of China-U.S. Partnership to Address Global Warming*, 3 CHINA ENVT'L AND RESOURCE LAW REVIEW, Ocean University (Renmin Press), available at http://www.law.uoregon.edu/faculty/mwood/docs/china08.pdf

[215] While declaring macro sovereign responsibility, this iteration of the atmospheric trust principle seemingly satisfies the rule that a declaratory judgment 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 U.S. Dist. LEXIS 61850 *23 (W.D. Wash. 2007). Courts have rejected overly broad declaratory judgments. *See id.*

[216] Winberger v. Romero-Barcelo, 456 U.S. 305, 312 (1982) (the basis for injunctive relief is a finding of irreparable injury and the absence of an adequate legal remedy).

[217] *See* Ariz. Ctr. for Law in the Pub. Interest v. Hassell, 837 P.2d 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 Mich. Fed'n v. U.S. Army Corps of Eng'rs, 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.").

An accounting is a traditional remedy springing from the equitable powers of the court in both the co-tenancy and trust contexts.[218] 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.[219] 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."[220] 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.[221] The scope of an accounting must include "all items of information in which the beneficiary has a legitimate concern."[222] 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."[223]

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 U.S., however, that a sovereign defendant may be subject to an accounting for mismanagement of a trust. In the federal Indian law context, recently, the U.S. government was subject to a multi-billion dollar accounting action for its mismanagement of tribal trust funds.[224] 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.[225] Courts have essentially engaged in natural "accountings" in the environmental context before, without using the label. For example, courts are quite familiar

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[218] *See*, *e.g.*, Evans v. Little, 271 S.E.2d 138, 141 (Ga. 1980) (co-tenancy); Willmon v. Koyer, 143 P. 694, 695 (Cal. 1914) ("As an incident to a cotenancy relationship, either cotenant has a right to demand of the other an accounting as to rents and profits of the cotenancy, which of course, involves the right of one cotenant 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 A.2d 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 F.3d 1081 (D.C. Cir. 2001) (*Cobell VI*) (accounting against federal government for mismanagement of Indian trust funds).

[219] *Evans*, 271 S.E.2d at 141.

[220] *In re* Estate of Ehlers, 911 P.2d 1017, 1021 (Wash. App. 1996) (*citing* Nelsen v. Griffiths, 585 P.2d 840, 843 (Wash. App.1978)).

[221] *See*, *e.g.*, 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."); *Koyer*, 143 P. at 695-96 ("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* WILLIAM B. STOEBUCK & DALE A. WHITMAN, THE LAW OF PROPERTY 205 (3d ed. 2000) (where a cotenant derives income from a use of land that permanently reduces its value the cotenant must account to the other cotenants); White v. Smyth, 214 S.W.2d 967, 978 (Tex. 1948) ("When it is claimed that a cotenant in possession of . . . property has become liable to his cotenants 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 cotenants].").

[222] *Zuch*, 500 A.2d at 568.

[223] *Id.*

[224] *See* Cobell v. Kempthorne, 455 F.3d 317, 319-21 (D.C. Cir. 2006) (describing background of litigation).

[225] *See* Torres, *supra* note 71, at 547 (calling for accounting); Hope M. Babcock, *The Public Trust Doctrine: What a Tall Tale They Tell,* 61 S. C. L. REV. 393, 410 (2009).

with assigning monetary value to resources and awarding natural resource damages to governmental trustees.[226] 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.[227]

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 modeling 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 U.S., for example, the Department of Energy maintains data on the overall carbon emissions of all fifty states.[228] While inevitably there will be areas 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 U.S. 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."[229] 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.'"[230] A judicially supervised accounting process would expose such legislative misappropriations on the peoples' 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.[231] Enjoining the sovereign to do so does not invade the prerogatives of the other

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[226] *See generally* Coeur D'Alene Tribe v. Asarco Inc., 280 F. Supp. 2d 1094 (D. Id. 2003).
[227] *See generally* Mary Christina Wood, *The Tribal Property Right to Wildlife Capital (Part I): Applying Principles of Sovereignty to Protect Imperiled Wildlife Populations*, 37 IDAHO L. REV. 1, 16 (2000).
[228] Raw data for state carbon dioxide emissions are available from the Energy Information Administration, *Energy Emissions Data & Environmental Analysis of Energy Data*, *available at* http://www.eia.doe.gov/environment.html (last visited Nov. 7, 2011).
[229] Coplan, *supra* note 33, at 330.
[230] *Id.*
[231] Proposed British legislation provides an example of a "carbon budget." *Britain Proposes Bold Environmental Legislation That Could Pave Way for Post-Kyoto Pact*, INTERNATIONAL HERALD TRIBUNE (Mar. 13, 2007) (on file with author). The city of Seattle, Washington, also provides an example of a jurisdiction that has developed a plan

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.[232] Over time, the court must receive periodic progress reports, a common feature of accounting cases. These reports inform the court and the 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).[233] 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 the 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.[234] 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.[235] More recently, in the ESA lawsuits over the imperiled 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-

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and template for carbon reduction. *See* City of Seattle, *A Climate of Change: Meeting the Kyoto Challenge, Climate Action Plan Highlights* (Sept. 2006) *available at* http://www.seattle.gov/climate/docs/SeaCAP_summary.pdf.

[232] In the Pacific Northwest treaty litigation, for example, federal courts have recognized the need for ongoing jurisdiction, which has lasted over three decades. *See, e.g.,* United States v. Washington, 384 F. Supp. 312, 346 (W.D. Wash. 1974) (acknowledging, in context of treaty fishing dispute between a state and tribes, that the remedy in face of changing conditions is best carried out through "retention of continuing jurisdiction, more appropriate than overly-detailed judicial predetermination.")(citation omitted); *see also* Blumm & Steadman, *supra* note 177 (summarizing litigation).

[233] *See*, *e.g.,* Fraser v. Se. First Bank of Jacksonville, 417 So.2d 707, 708 (Fla. App. 1982) (citing Florida statutes); Cobell v. Norton, 240 F.3d 1081, 1086 (D.C. Cir. 2001) (quarterly reports in Indian trust litigation against the federal government).

[234] *See* Puget Sound Gillnetters Ass'n v. U. S. Dist. Court, 573 F. 2d 1123, 1133 (9th Cir. 1978); United States v. Washington, 520 F.2d 685, 686, 693 (9th Cir. 1975); *see also discussion in* Mary Christina Wood, *Restoring the Abundant Trust: Tribal Litigation in Pacific Northwest Salmon Recovery*, 36 ENVTL. L. REP. 10163, 10176-77 (2006).

[235] *See discussion in* Mary Christina Wood, *Reclaiming the Natural Rivers: The Endangered Species Act Applied to Endangered River Ecosystems*, 40 ARIZ. L. REV. 197, 233 (1998).

sovereign consultation structured by the court.[236] Courts have supervised broad plans to address exclusionary zoning, racial desegregation, and prison reform.[237] 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 enforceable plans for proper trust management.[238] 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.[239] It is within the traditional province of courts of equity to devise relief to remedy the harm.[240] 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.[241]

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[236] *See* Wood, *Restoring the Abundant Trust*, *supra* note 234, at 10175-76.

[237] *See* Coleman v. Schwarzenegger, Opinion in Case NO. CIV S-90-0520 LKK JFM P (Three Judge Federal Court, August 4, 2010) (prison case), *available at* http://www.caed.uscourts.gov/caed/Documents/90cv520o10804.pdf; S. Burlington Cnty. N.A.A.C.P. v. Township of Mount Laurel, 336 A.2d 713 (N.J. 1975) (land use reform); S. Burlington Cnty. N.A.A.C.P. v. Township of Mount Laurel, 456 A.2d 390 (N.J. 1983) (land use reform); *see also* discussion in JOSEPH WILLIAM SINGER, PROPERTY LAW: RULES, POLICIES, AND PRACTICES 908 (4th ed. 2006).

[238] *See* Cobell v. Kempthorne, 455 F.3d 317, 330-31 (D.C. Cir. 2006) (reviewing reversals of district court remedies in an Indian trust accounting case); Cobell v. Norton, 283 F. Supp. 2d 66 (D. D.C. 2003), *rev'd on other grounds*, 392 F.3d 469 (D.C. Cir. 2004).

[239] *See, e.g.,* United States v. Metropolitan Dist. Comm'n, 757 F. Supp. 121, 128-29 (D. Mass. 1991), *aff'd*, 930 F.2d 132 (1st Cir. 1991) (moratorium against sewer hook up); Jeffery J. Matthews, *Clean Water Act Citizen Suit Requests for Municipal Moratoria: Anatomy of a Sewer Hookup Moratorium Law Suit*, 14 J. ENVTL. L. & LITIG. 25 (1999) (discussing injunctions imposing moratoria against sewer hookups); Am. 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); Pac. Rivers Council v. Thomas, 30 F.3d 1050 (9th Cir. 1994) (enjoining the U.S. Forest Service from proceeding with projects under land resource management plans prior to ESA consultation); Lane Cnty. Audubon Soc'y v. Jamison, 958 F.2d 290, 294 (9th Cir. 1992) (enjoining the Bureua of Land Management from new timber sales until Endangered Species Act consultation was completed); Thomas v. Peterson, 753 F.2d 754 (9th Cir. 1975) (enjoining construction of road until agency prepared biological assessment); Or. Natural Desert Ass'n v. Singleton, 75 F. Supp. 2d 1139 (permanently enjoining 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.

[240] *See* Alaska Ctr. for the Env't v. Browner, 20 F.3d 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 U.S. 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.").

[241] *See, e.g.* Matt Gouras, *Judge: Ag Undersecretary Avoids Jail Time*, THE SEATTLE TIMES (Feb. 27, 2008), *available at* http://seattletimes.nwsource.com/html/nationworld/2004244917_apbushofficialcontempt.html?syndication=rss (district court threatening to hold U.S. 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 counties 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 acknowledgment that every sovereign, not just willing sovereigns, bear responsibility for atmospheric health. The declaratory judgments 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 time frames 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.[242] These funds, gained from the private fossil-fuel industry polluters, could substantially help finance the zero-carbon economic transition in the developing world.[243]

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 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 world-wide in order to achieve the 100 GtC necessary for a return to 350 ppm. Developing

[242] RESTATEMENT (SECOND) OF TORTS § 177 (1959).
[243] Natural resource damage suits are beyond the scope of this chapter.

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.

IV. Conclusion

As the planet approaches climate points of no return, trial attorneys and community lawyers across the globe should unite in a world-wide 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 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 a 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.[244] 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 torturous 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."[245] Given the stakes of planetary heating for the youth alive today, much less their future children, one would expect legislatures and agencies world-wide to respond with emergency haste to climate crisis, rendering litigation altogether unnecessary. Instead, political leaders and governing institutions around the world, many of whom are political accomplices of the fossil fuel industry, still push the world on a deadly "Business as Usual" course. Having squandered any further opportunity 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 world-wide 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,[246] or Mahatma Gandhi's great Salt March to the sea in 1930.[247] 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

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[244] Over two decades have passed since the United States Congress was notified by the nation's leading climate scientist that, with 99 percent 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, STORMS OF MY GRANDCHILDREN, *supra* note 148, at xv.

[245] *See supra* note 6.

[246] 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* JOHN CRONIN & ROBERT F. KENNEDY, THE RIVERKEEPERS 139-142 (1999).

[247] The British government 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* Vinay Lal, *Dandi*, *Salt March*, History and Politics, MANAS, *available at* http://www.sscnet.ucla.edu/southasia/History/Gandhi/Dandi.html (website of Vinay Lal, Assistant Professor of History, UCLA) (last visited Nov. 7, 2011).

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 catalyzes 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."[248] 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."[249] Judges in many civil law systems have analogues that can carry powerful trust principles forward 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."[250]

Unfortunately, after three 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 heroic 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 epoch 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.

V. 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, coordinated by Our Children's Trust, consisted of a federal lawsuit, nine state law suits, thirty-nine petitions for state rule-making, and one notice of intent to sue – a legal campaign covering all fifty states in the U.S., filed in May 2011.[251] Internationally, an ATL lawsuit was filed in Ukraine, with subsequent legal actions planned in other countries as well.[252] The suits and petitions declared a sovereign atmospheric trust duty and called upon government to produce carbon accountings and plans for annual

[248] O.W. HOLMES, THE COMMON LAW 1 (1881).
[249] STORY, *supra* note 98, at 203.
[250] WILLARD, *supra* note 63, at 38.
[251] 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.
[252] The Ukraine complaint is posted at: http://www.ourchildrenstrust.org/sites/default/files/Ukraine%20ATL%20English.pdf.

emissions reductions of at least 6 percent (as well as to embark on reforestation and improved soil practices to achieve carbon drawdown from the atmosphere). The fifty 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.[253]

This initial "hatch" of ATL actions corresponded with 125 youth-led marches (called the "iMatter Marches") in cities across the U.S. 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 v. Global Warming.[254] 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.[255] Alec Loorz, the sixteen-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 to 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

[253] *See* James Hansen et al., *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.
[254] See http://imattermarch.org/.
[255] *Id.*

that threaten our future. We matter. Our future matters.[256]

[256] Alec Loorz, *Why One 16-year-old is Suing the US Government Over Climate Change*, GUARDIAN ENVIRONMENTAL NETWORK (May 5, 2011), *available at* http://www.guardian.co.uk/environment/2011/may/05/sueing-us-government-climate.