

NATURE'S TRUST: A LEGAL, POLITICAL, ECONOMIC, AND MORAL FRAME FOR GLOBAL WARMING

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I. INTRODUCTION

I feel very privileged to be here today. Last weekend, when I was at the Oregon coast with my family, my little boys and I came to the edge of a small stream at the very moment a teenaged boy hooked a huge steelhead. That fish launched out of the water with a force that electrified my boys. And it occurred to me that, in this age of habitat loss, that fish probably would not have thrived in that stream were it not for the work of scientists like you who have learned the biological needs of the species and have conveyed that information to lawmakers and the public. In so many ways, you are the messengers of truth flowing in the waters that carry our children's inheritance, and I am deeply grateful for your work.

Much of my career has been spent with fisheries law. But now, 100 percent of my time is spent on climate crisis. Some of you are already studying threats to Idaho fisheries from global warming. For the rest of you, I can only imagine that you may look back on this conference as a turning point in your careers – the week you joined the ranks of climate scientists. It's as if, once you stare this crisis in the face, there's no turning away.

I'd like to start by describing global warming in very broad terms, and then talk about government's colossal failure to address carbon pollution. Then I will turn to a legal principle that I hope can catalyze the kind of paradigm shift needed to confront this crisis. And I will end with a few observations about how climate crisis is shaping a new scientific culture.

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II. THE PRECIPICE

Let's start with the big picture. Carbon levels in the atmosphere are now higher than they have been for the last 650,000 years. Every day, humans release another 70 million tons of carbon into the atmosphere.² The world's carbon emissions are rising nearly three times faster than they did in the 1990s, increasing by about 3% every year.³ Once in the atmosphere, carbon stays for 100 to 1,000 years.⁴ This means generations to come will be trapped under a greenhouse roof of our making.

Six months ago, leading climate scientists issued a report concluding that Earth is in "imminent peril."⁵ Scientists have said that if we don't curb carbon now, future Humanity will be living on a "transformed planet."⁶ Global heating threatens to destroy major planetary fixtures, including the polar ice sheets, Greenland, the coral reefs, and the Amazon forest.

The Earth has already heated nearly 1°C (1.8°F) from pre-Industrial average temperatures.⁷ And because of the carbon already in the atmosphere, a total 2°C (3.6°F) rise is now inevitable.⁸ That 2°C rise is what scientists consider to be the threshold of catastrophic, runaway heating.⁹ Exceeding this would make it warmer on Earth than it has been for half a million years, and, to quote one leading scientist, "Many things could become unstoppable."¹⁰

The UN projects that this irrevocable 2°C rise will put up to 30% of plant and animal species at risk of extinction.¹¹ Species of all sorts are already migrating towards the poles and higher latitudes in search of cooler temperatures. Coral reefs worldwide are

² See Al Gore, *Moving Beyond Kyoto*, NEW YORK TIMES (July 1, 2007), <http://www.nytimes.com/2007/07/01/opinion/01gore.html>.

³ Peter N. Spotts, *Global Carbon Emissions in Overdrive*, THE CHRISTIAN SCIENCE MONITOR (May 22, 2007), <http://www.csmonitor.com/2007/0522/p01s03-wogi.html>.

⁴ Email from Jim Hanson, Jan. 23, 2008, regarding correspondence with the Chancellor of Germany, http://www.columbia.edu/~jeh1/mailings/20080122_DearChancellor.pdf.

⁵ James Hansen et al., *Climate Change and Trace Gases*, PHIL. TRANS. R. SOC. A, 1925, 1949 (2007) [hereinafter *Climate Change and Trace Gases*], available at <http://www.planetwork.net/climate/Hansen2007.pdf>.

⁶ Jim Hansen, *The Threat to the Planet*, 53 THE NEW YORK REVIEW 12 (July 13, 2006), http://pubs.giss.nasa.gov/docs/2006/2006_Hansen.pdf. See also *Climate Change and Trace Gases*, supra note 5, at 1926 ("[C]ontrol of [GHG] must play a critical role in preserving a planet resembling the one on which civilization developed.").

⁷ U.S. Geological Survey, *Sea Level and Climate*, <http://pubs.usgs.gov/fs/fs2-00/>.

⁸ Cahal Milmo, "Too Late to Avoid Global Warming," *Say Scientists*, THE INDEPENDENT UK (September 19 2007), <http://www.independent.co.uk/environment/climate-change/too-late-to-avoid-global-warming-say-scientists-402800.html>.

⁹ *Id.*

¹⁰ Jim Hansen, *Climate Change: On the Edge*, THE INDEPENDENT, Feb. 17, 2006, <http://environment.independent.co.uk/article345926.ece>.

¹¹ See Milmo, supra note 8 (estimate calibrated to stabilization at 1.5C to 2.5C).

bleaching and dying.¹² Climate heating is driving relentless drought in Australia and the Southwest. It's shrinking the Great Lakes, reservoirs in the West, and Lake Chad in Africa. It's causing severe water shortages in Tibet and Tennessee, floods in Texas and Jakarta, mega-fires in California, Greece and Idaho, and killer hurricanes in New Orleans and Honduras. Mosquito-borne illness is sickening people in high elevation places that have never seen tropical disease. In the forests of British Columbia, beetle infestations have killed millions of acres of trees,¹³ and U.S. foresters now predict that every large, mature lodge-pole pine forest in Colorado and southern Wyoming will be dead within five years.¹⁴ Climate change is delivering heat waves that killed 35,000 people in Europe in 2003, and sent thousands of Americans to cooling centers in 2006 and 2007. It's spiking summer temperatures in Death Valley to 125°F¹⁵ and warming New York City to 72°F in the middle of winter.¹⁶ As one UN scientist put it: "Ten years ago we were talking about these impacts affecting our children and our grandchildren. Now it is happening to us."¹⁷

Sea levels are rising. The UN has warned nations to prepare for up to a 2-foot rise by century's end.¹⁸ But more recently assembled data shows accelerated loss of ice far outpacing even the most pessimistic UN projections. A year ago scientists made a stunning prediction that the arctic might be free of summer ice by 2040.¹⁹ More recently some have revised that date to 2012.²⁰ In West Antarctica, ice loss increased by 59 percent over the past decade.²¹ In Greenland, ice loss doubled over about the same

¹² Sean Markey, *Global Warming Has Devastating Effect on Coral Reefs, Study Shows*, NATIONAL GEOGRAPHIC (May 16, 2006), http://news.nationalgeographic.com/news/2006/05/warming-coral_2.html.

¹³ Doug Struck, *Rapid Warming Spreads Havoc in Canada's Forests*, WASHINGTON POST (March 1, 2006), <http://www.washingtonpost.com/wp-dyn/content/article/2006/02/28/AR2006022801772.html>

¹⁴ Todd Hartman, *Deaths of Trees 'Catastrophic,' Lodge-Pole Die Offs Imperil Recreation, Supplies of Water*, ROCKY MOUNTAIN NEWS (Jan. 15, 2008), <http://www.rockymountainnews.com/news/2008/jan/15/beetle-infestation-get-much-worse/>.

¹⁵ Jennifer Steinhauer, *Nation Sweats as Heat Hits Triple Digits*, THE NEW YORK TIMES (July 8, 2006), <http://www.nytimes.com/2006/07/18/us/18sizzle.html>.

¹⁶ Manny Fernandez, *72 Degree Day Breaks Record in New York*, THE NEW YORK TIMES (Jan. 7, 2007), <http://www.nytimes.com/2007/01/07/nyregion/07heat.html>.

¹⁷ Milmo, *supra* note 8.

¹⁸ See U.S. Environmental Protection Agency, *Coastal Zones and Sea Level Rise*, <http://www.epa.gov/climatechange/effects/coastal/index.html#ref> (summarizing UN IPCC conclusions). See also *Glaciers and Ice Caps to Dominate Sea Level Rise This Century, Says Study*, SCIENCE DAILY (July 20, 2007) (noting that one foot sea level rise typically causes retreat of 100 feet or more of shoreline).

¹⁹ See Seth Borenstein, *Arctic Sea Ice Gone in Summer within Five Years?* ASSOCIATED PRESS (Dec. 12, 2007), <http://news.nationalgeographic.com/news/2007/12/071212-AP-arctic-melt.html>. See also Holland, M. M., C. M. Bitz, & B. Tremblay (2006), *Future Abrupt Reductions in the Summer Arctic Sea Ice*, GEOPHYS. RES. LETT., 33, L23503, doi:10.1029/2006GL028024, (Dec. 12, 2006), <http://www.agu.org/pubs/crossref/2006/2006GL028024.shtml>; Doug Struck, *At Poles, Melting Occurring at an Alarming Rate*, WASHINGTON POST (Oct. 22, 2007), <http://www.washingtonpost.com/wp-dyn/content/article/2007/10/21/AR2007102100761.html> (The arctic sea ice now reaches only half as far as it did just 50 years ago).

²⁰ Borenstein, *supra* note 19. See also Stroeve, J., M. M. Holland, W. Meier, T. Scambos, and M. Serreze (2007), *Arctic Sea Ice Decline: Faster Than Forecast*, GEOPHYS. RES. LETT., 34, L09501, doi:10.1029/2007GL029703 (2007), <http://www.agu.org/pubs/crossref/2007/2007GL029703.shtml> (abstract).

²¹ Marc Kaufman, *Scientists See Rapid Ice Loss in Western Antarctica*, THE WASHINGTON POST (Jan. 14, 2008).

period.²² Last month, the head of the UN's climate panel (IPCC) asked scientists to look at what he called the "frightening" possibility that ice sheets in Greenland and Antarctica could melt rapidly at the same time.²³ Melting of the West Antarctic and Greenland ice sheets would add up to a sea level rise of 10 or more meters.²⁴ A 10 meter rise would flood about 25 percent of the U.S. population.²⁵ If the entire Antarctic ice sheet and Greenland melt, the world faces a sea-level rise of about 80 meters.²⁶

As climate disaster strikes various areas, people start to move in desperate search of survival resources. The UN has alerted nations to prepare for 50 million environmental refugees by 2010.²⁷ A world security report co-authored by a former head of the CIA, a former Chief of Staff, a former Deputy Assistant Secretary of Defense and others, describes the scenario of a 2.6 C° average increase in global temperature by 2040. In their words:

Massive nonlinear events in the global environment give rise to massive nonlinear social events. . . . [N]ations around the world will be overwhelmed by the scale of change. . . . The social consequences range from increased religious fervor to outright chaos.²⁸

The darkest outlook comes from James Lovelock, long thought of as a prophet of climate science, who predicts, by the end of the century, most of Earth's current population of 6.6 billion people will be wiped out, leaving only about 500 million hanging on at the far latitudes of the planet.²⁹ We can only hope he is dead wrong.

Many of you might be wondering about the climate skeptics. If you follow their trail, you find most are paid by industry-funded think tanks to spread confusion. The reality is that anyone still in denial wants to be in denial, and they are probably just best ignored. To quote the Washington Post: "For scientists, global warming is a disaster

²² *Greenland Ice Melting Faster than Thought* (Feb. 17, 2006), <http://www.physorg.com/news10948.html>; *Greenland Melt "Speeding Up"* <http://news.bbc.co.uk/2/hi/science/nature/4783199.stm> (Aug. 11, 2006) (discussing period between 1996 and 2005).

²³ Marc Kauffman, *Scientists See Rapid Ice Loss in Western Antarctica*, THE WASHINGTON POST (Jan. 14, 2008). Many scientists are focusing on the West Antarctic ice sheet, which is especially vulnerable, because much of it is grounded below sea level. As the U.S. Geological Survey states, "Small changes in global sea level or a rise in ocean temperatures could cause a breakup of . . . ice shelves. The resulting surge of the West Antarctic ice sheet would lead to a rapid rise in global sea level." *Sea Level and Climate*, *supra* note 7.

²⁴ *Id.*

²⁵ *Id.*

²⁶ *Id.*

²⁷ *Millions Will Flee 'Degradation,'* BBC NEWS (Oct. 11, 2005), <http://news.bbc.co.uk/2/hi/science/nature/4326666.stm>.

²⁸ CENTER FOR STRATEGIC AND INTERNATIONAL STUDIES, *The Age of Consequences: The Foreign Policy and National Security Implications of Global Climate Change* 9 (Nov. 2007).

²⁹ *Fiddling With Figures While the Earth Burns*, THE SUNDAY TIMES (May 6, 2007), <http://www.timesonline.co.uk/tol/news/uk/science/article1751509.ece>; Jeff Goodell, *The Prophet of Climate Change*, James Lovelock, ROLLING STONES MAGAZINE, (Oct. 17, 2007) http://www.rollingstone.com/politics/story/16956300/the_prophet_of_climate_change_james_lovelock/2.

movie, its opening scenes set at the poles of Earth. The epic already has started. And it's not fiction."³⁰

For quite some time the question has not been *whether* global warming is occurring. The question is whether we will cut our carbon emissions in time to prevent runaway heating. NASA scientist Jim Hansen, widely regarded as the “preeminent climate scientist of our time,”³¹ wrote just days ago, “We are now on the hairy edge.”³²

There is no doubt that Humanity is in for severe climate punishment. But the consequences will be unthinkable worse if we don't slash emissions now. If we continue on the present course, the UN projects a temperature rise of 6.1° C – (that's about 11° F) by century's end.³³

We are rapidly slipping towards a climate tripwire -- a point of no return that climate scientists call the tipping point.³⁴ At such point, our enormous carbon pollution will kick in positive feedbacks in Nature that are capable of unraveling the planet's climate system, causing runaway heating, despite any subsequent carbon reductions achieved by Humanity.³⁵ Scientists have identified several dangerous feedbacks. One is the albedo flip. When ice melts and turns to water, it causes further heating, because water absorbs heat and ice deflects heat.³⁶ So, melting begets more melting. Another feedback is the failure of Earth's natural sinks to absorb more carbon.³⁷ The Amazon Rainforest is drying and burning, releasing more carbon than its remaining vegetation can absorb.³⁸ The oceans are becoming saturated with carbon.³⁹ In short, these places are on the verge of turning from sink to source. Another feedback results from vast expanses of permafrost melting in Siberia and Alaska, which has the capacity to release enormous amounts of carbon and methane – a scenario aptly described as an “atmospheric tsunami.”⁴⁰

³⁰ Struck, *supra* note 19.

³¹ MARK BOWEN, CENSORING SCIENCE 3 (2008).

³² See *supra* note 4.

³³ UN INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, FOURTH ASSESSMENT REPORT, CLIMATE CHANGE 2007: SYNTHESIS REPORT: SUMMARY FOR POLICYMAKERS (hereafter SYNTHESIS REPORT), Table SPM.1, http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf. The UN predicts runaway heating will put 70% of the world's species into extinction. Arthur Max, *UN Panel Gives Dire Warming Forecast*, ASSOCIATED PRESS (Nov. 17, 2007), http://news.nationalgeographic.com/news/2007/11/071119-AP-climate-change_2.html.

³⁴ For general explanation, see Goddard Institute for Space Studies, *Research Finds that Earth's Climate is Approaching 'Dangerous' Point* (May 30, 2007), http://www.nasa.gov/centers/goddard/news/topstory/2007/danger_point.html.

³⁵ For a brief description see Struck, *supra* note 19. For a more detailed explanation see FRED PEARCE, WITH SPEED AND VIOLENCE (BEACON PRESS 2007).

³⁶ See Steve Connor, *The Earth Today Stands in Imminent Peril*, THE INDEPENDENT (June 22, 2007).

³⁷ SYNTHESIS REPORT, *supra* note 33 at 7 (“Warming reduces terrestrial and ocean uptake of atmospheric CO₂, increasing the fraction of anthropogenic emissions remaining in the atmosphere.”).

³⁸ PEARCE, *supra* note 35, at 65.

³⁹ *Id.* at 87.

⁴⁰ *Id.* at 78.

These feedbacks all lead us closer to a precipice.⁴¹ Even two years ago it was thought that we might have 8-10 years before the climate tipping point, but more recent data shows we are on its doorstep now.⁴² To quote a leading study, “Earth [is] perilously close to dramatic climate change that could run out of our control. . . .”⁴³ The head of the UN’s IPCC recently told the world, “What we do in the next two to three years will determine our future. This is the defining moment.”⁴⁴

Two years. This deadline has not registered with Americans. The United States continues to produce nearly 30% of the world’s greenhouse pollution. Look around. Our society is nowhere near decarbonizing. Many people seem happily oblivious to this global catastrophe, perhaps because it seems more like science fiction than reality. Indeed, it seems the more dire the environmental issue, the less likely it is to be taken seriously in the United States of America.⁴⁵

III. ENVIRONMENTAL LAW GONE ASTRAY

So let’s review the big picture. We face a problem that is unprecedented in terms of its consequences; a problem that is caused by virtually everyone on Earth; a problem that, to solve, requires us to overhaul our sectors and lifestyles; and, as if that were not enough, a problem that requires us to act before Nature passes a critical tipping point looming right in front of us. Climate thinkers agree: nothing less than a massive, global atmospheric defense effort surpassing the scale of WWII will provide hope of stabilizing climate at this point.

This is no time to get discouraged. We must save despair for better times. Here is the hopeful part. We have the human imagination, the resources, the legal tools, and the bureaucracy to cut carbon. We can do so without harming our citizens – in fact these efforts could vastly improve our quality of life. But this is clearly a task for government. And this is exactly why we have government – to address threats to society and organize a response. All of our regulatory authority and public funds are locked up in government. We need those resources to be put to use immediately in curbing greenhouse gas emissions. Yet, do you see mayors, city councils, state legislatures, Congress, and the President convening task forces and meeting daily and working late to address this problem? No, in fact, our government is *driving* this world towards runaway greenhouse gas emissions. County commissioners are approving trophy home subdivisions and destination resorts. State environmental agencies are approving air permits. The Forest

⁴¹ *Id.* at xxiv.

⁴² Milmo, *supra* note 8.

⁴³ *Climate Change and Trace Gases*, *supra* note 5, at 1925.

⁴⁴ *UN Panel: World Has 5 Years to Avert Climate ‘Disaster,’* NEW YORK TIMES (Nov. 18, 2007).

⁴⁵ But as Tony Blair, former Primer Minister of Great Britain, told the world, “This disaster is not set to happen in some science fiction future many years ahead, but in our lifetime. Unless we act now . . . these consequences, disastrous as they are, will be irreversible.” Simon Hooper, *Report Sets Climate Change Challenge*, CCC.COM (Oct. 30, 2006).

Service is approving huge timber sales.⁴⁶ And the U.S. Environmental Protection Agency is permitting coal-fired plants and expanding mountaintop coal mining. Through these actions, government is signing our children up for a draft of their lifetimes in an unending war for survival. But this war will be the scariest, because it has no end, not even for their descendants.

There presently exists a deep gulf between what we should be doing and what we are doing. We must remember that in a system of democracy, citizens do hold the levers of government. Government will act if citizens demand it. But our leaders will not act if citizens do not demand them to. Abraham Lincoln once said, "Public sentiment is everything. With [it], nothing can fail. Without it, nothing can succeed."⁴⁷ The heart of the problem is this: Americans seem to have lost their understanding that government is obligated to protect their natural resources. And when the public loses its sense of government responsibility, believe me, government officials quickly lose their sense of responsibility towards the public.

There is no better evidence of this than the position taken by the U.S. Environmental Protection Agency with respect to climate change. The EPA is the only agency charged by Congress to protect the air and atmosphere. Yet the agency is spending its talent and taxpayer money to *resist* protecting the atmosphere. The agency even sent its lawyers all the way to the United States Supreme Court to argue that EPA did not have to regulate carbon dioxide pollution.⁴⁸ The lawyers characterized the protection of our atmosphere as a political choice, and claimed that the agency has discretion to permit pollution by the fossil fuel and automobile industries. No matter that this legalized pollution threatens to destroy the climate stability that has supported human civilization for 12,000 years. EPA lost that case, but it still hasn't passed rules regulating carbon dioxide, and it's now doing everything in its power to prevent California from passing standards for new automobiles. It is as if our home is on fire, twenty fire trucks are in the driveway with hoses drawn, and the fire chief claims discretion to sit idle and watch our house burn down.

Unless we Americans quickly gain a fierce national sense that our leaders are responsible for protecting our atmosphere, we won't force them to take the bold action necessary within that narrow two year window of time we have left. Our leaders will continue to fiddle in Rome as this country is pulled over the tipping point into a terrifying world of runaway heating.

In order to solve the problem, we must understand its cause. How have Americans lost sight of their government's basic obligation to protect our crucial natural resources? Ironically, the explanation lies in an unintended consequence of our modern environmental law. In the 1970s, at the height of the environmental movement, Congress

⁴⁶ For discussion of forest harvest impacts on climate, see Union of Concerned Scientists, *Recognizing Forests Role in Climate Change*, http://www.ucsusa.org/global_warming/solutions/recognizing-forests-role-in-climate-change.html.

⁴⁷ See http://www.brainyquote.com/quotes/authors/a/abraham_lincoln.html.

⁴⁸ *Massachusetts v. EPA*, 127 S.Ct. 1438, 1454 (2007).

passed a set of ambitious environmental statutes, among them the Clean Water Act, the Clean Air Act, the Endangered Species Act, and many others. These statutes gave us more environmental law than any other country in the world. They provide tremendous authority to federal, state, and local officials to control just about any environmental harm you can think of. The problem is that, along with this authority, these laws also gave discretion to agencies to permit the very pollution or land destruction that the statutes were designed to prevent. Of course, the permit systems were never intended to subvert the goals of the environmental statutes. But the majority of agencies now spend nearly all of their resources to permit, rather than prohibit, environmental destruction. They have used their discretion to enshrine a permit system that inevitably sinks the statutory goals. Whether you are talking about the EPA, or the U.S. Fish and Wildlife Service, a state water agency, or a city planning agency, most agencies simply are not saying no.⁴⁹ And now, the overarching mindset of nearly all agencies is that permits are there to be granted.

Because of these permit systems, society has lapsed into assuming that government must have nearly unbridled discretion to allow destruction of our natural assets. This discretion obviously invites undue political influence. Government discretion is to industry what honey is to bears. The danger is this: we have relegated climate to the political playing field. There is no umpire on this field. There's just discretion. Citizens now find it normal to have to go lobby government for their own survival!

The public has to find a new frame for viewing government's role towards Nature. As author George Lakoff says, "Reframing is changing the way the public sees the world. It is changing what counts as common sense." Let's now look at an ancient yet enduring legal framework designed citizens to hold government accountable.

IV. A NEW FRAME: GOVERNMENT'S TRUST OBLIGATION

A. THE BEDROCK OF ENVIRONMENTAL DUTY

The bedrock principle of this framework is that government is trustee of our natural assets, including the waters, wildlife, and air. A trust is a fundamental type of ownership whereby one manages property for the benefit of another – similar to you

⁴⁹ The problem is not limited to the United States. As the former Executive Director of the United Nations Environment Program noted:

The field of law has, in many ways, been the poor relation in the world-wide effort to deliver a cleaner, healthier and ultimately fairer world. We have over 500 international and regional agreements, treaties and deals covering everything from the protection of the ozone layer to the conservation of the oceans and seas. Almost all, if not all, countries have national environmental laws too. But unless these are complied with, unless they are enforced, then they are little more than symbols, tokens, paper tigers. This is an issue affecting billions of people who are effectively being denied their rights and one of not only national but regional and global concern.

Klaus Topfer, Executive Director of the United Nations Environment Program on the adoption of the Judges' Johannesburg Principles on the Role of Law and Sustainable Development (Aug. 2002), at <http://www.climatelaw.org> (viewed 10.31.06).

managing a college account for your niece. We all hold a common property interest in Nature's Trust.⁵⁰ We, along with future generations, are the rightful beneficiaries of this natural endowment, and we need our trust to be productive in order to sustain human survival and promote human welfare. Our imperiled atmosphere is the most crucial asset in our trust.

With every trust, there is a core duty of protection. The trustee must defend the trust against injury. Our government trustees do not have discretion to allow irrevocable damage to the trust. As our Supreme Court said back in 1892: "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"⁵¹

This obligation to protect Nature's Trust lies at the very heart of government's purpose. A government that fails to protect its natural resources sentences its people to misery. When we call upon our government to safeguard our atmosphere, we are invoking principles that are engrained in sovereignty itself. These trust principles have been said to "exist from the inception of humankind."⁵²

In this country, Nature's Trust principles were penned by judges long ago as the first environmental law of this nation.⁵³ The trust principle underlies all of our modern environmental statutes.⁵⁴ We can take those environmental laws, and without changing a word of them, reframe our government's role with respect to Nature. By reframing, we can turn the government's claimed discretion to *destroy* Nature into an obligation to *protect* Nature. Looking back in the history of this country, reframing was essential to the Civil Rights Movement, the Women's Rights Movement, and FDR's New Deal.

When we portray Nature as a trust, we vest citizens with expectations of lasting property rights to a defined, bounded asset. We start thinking, "Hey, that's my air, even if I share it with others." Pollution of that air becomes an infringement on American

⁵⁰ *Geer v. Connecticut*, 161 U.S. 519 (1896) ("The power . . . 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 benefit of private individuals as distinguished from the public good."). For discussion of the Nature's Trust paradigm as it applies to environmental law, see Mary Christina Wood, *Nature's Trust: Reclaiming An Environmental Discourse*, 25 VIRGINIA L. J. 431 (2007), <http://www.law.uoregon.edu/faculty/mwood/docs/nreclaiming.pdf>.

⁵¹ *Ill. Cent. R.R. Co. v. Illinois*, 146 U.S. 387, 453 (1892). The Court also said: "Every legislature must, at the time of its existence, exercise the power of the state in the execution of the trust devolved upon it." *Id.* at 460.

⁵² *Oposa v. Factoran*, G.R. No. 101083 (July 30, 1993) (Supreme Court of the Philippines), excerpted in JAN G. LAITOS, SANDRA B. ZELLMER, MARY C. WOOD, & DAN H. COLE, NATURAL RESOURCES LAW, Ch. 8.II, at 441–44 (West Publishing 2006).

⁵³ See *Illinois Central Railroad v. Illinois*, 146 U.S. 387, 393 (1892). The body of law known as the "public trust doctrine" is compiled and analyzed in LAITOS, ZELLMER, WOOD, & COLE, NATURAL RESOURCES LAW, *supra* note 52, at ch. 8.II.

⁵⁴ In the opening provision of the National Environmental Policy Act (NEPA), Congress declared a national duty to "fulfill the responsibilities of each generation as trustee of the environment for succeeding generations." National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. §4331(b)(1). Federal pollution laws also designate sovereigns (federal, tribal and state governments) as trustees of natural resources for purposes of collecting natural resource damages.

property. The failure to mount a national climate defense is as absurd a proposition as the idea of government sitting idle during an attack on American soil. But this principle works in reverse as well. We can pass any new law we want, and no matter what it says, if it is pressed through the discretion frame, the government will continue to impoverish natural resources until society can no longer sustain itself.

B. THE ECONOMIC AND MORAL REALMS

Let's look at how the trust principle finds reinforcement in the economic and moral realms, because a true societal paradigm shift must reach well beyond the law. In economic terms, the Nature's Trust principle finds profound synergy with "natural capitalism,"⁵⁵ which is a fundamental rethinking in economics that requires businesses to build profits by using the Earth's interest, not its capital. When you read about wind power increasing 25% in one year alone, that represents a piece of Industrial Capitalism converting to Natural Capitalism. Of course if wind, tidal, geothermal, and solar energy continue to grow, these green industries will snuff out a major part of the fossil fuel industry. As well they should. After all, the heart of American capitalism is innovation. Economic dinosaurs and dirty industries should perish and make way for cleaner industries that won't damage or drain the natural capital that we all rely on. Climate scientists have made clear that Humanity cannot release to the atmosphere all, or even most, of the remaining fossil fuel CO₂. In their words: "To do so would guarantee dramatic climate change, yielding a different planet than the one on which civilization developed. . . ."⁵⁶ When we invoke natural capitalism, for the first time ever, we design our economic structure to harmonize with government's timeless duty to protect the assets in our Trust.

In moral terms, Nature's Trust characterizes the natural assets as part of the Endowment that future generations are entitled to inherit just as we inherited them. Failure to protect natural inheritance amounts to generational theft. The duty towards future generations is a moral imperative that speaks universally to all cultures, all ages, and all classes. This obligation springs from the heart of all Humanity. It is *this* law, not some arcane provision of the Clean Air Act, that carries hope of bringing citizens of the world together in planetary patriotism to mount a global atmospheric defense effort.

V. THREE PRINCIPLES GOVERNING ATMOSPHERIC TRUST PROTECTION

Within this trust framework, I would now like to offer three concrete principles to direct government's climate response.

A. THE SCIENTIFIC IMPERATIVE: CARBON MATH

The first principle is that the laws of Nature, not politics, must define the necessary action. Scientists have used climate modeling to present us with a path that

⁵⁵ See PAWL HAWKEN, AMORY LOVINS, & L. HUNTER LOVINS, *NATURAL CAPITALISM: CREATING THE NEXT INDUSTRIAL REVOLUTION* (Little Brown 1999); PETER BARNES, *CAPITALISM 3.0* (Barrett-Koehler 2006).

⁵⁶ See *Climate Change and Trace Gases*, *supra* note 5, at 1939.

they believe will keep us on the safe side of the tipping point. To achieve this 2° C limit, we have to keep atmospheric concentrations of carbon dioxide below – and maybe well below -- 450 parts per million (ppm).⁵⁷ We can think of this as the “climate imperative.” We are presently above 383 parts per million, and we dare not linger there long. You see that this is really a matter of carbon math. We must realize that if various political measures do not add up to the required carbon math in time, they will be futile.

B. THE CLIMATE PRESCRIPTION

The second principle builds on the first. Trustees have specific fiduciary duties that serve as standards of performance. We don’t just vest trustees with priceless assets and have no accountability. If you have a million dollars in a retirement account and a bank is your trustee, you wouldn’t just say, “Here’s the account to manage on my behalf. I don’t so much care whether you get a 15% yield or 2%, or even give it away –I’ll just take whatever is left.” You certainly would not take that approach with a trustee that manages the assets you rely on for survival. The trustee has to measure up to a fiduciary standard of care.

So what is the fiduciary standard of care for protecting the atmosphere? In September, 2007, the Union of Concerned Scientists issued an emissions target for stabilizing the climate.⁵⁸ This is a clear, quantitative prescription for action to get our planet back on the path to climate equilibrium⁵⁹ – and it is therefore a yardstick for government’s fiduciary obligation. There are three things the U.S. must do: 1) arrest the growth of emissions by 2010; 2) reduce greenhouse gas emissions by 4% each year thereafter; and 3) ultimately bring emissions down to 80% below 2000 levels by 2050. The deadline to arrest emissions by 2010 is directly in line with a call by the UN to halt worldwide emissions growth by 2015.⁶⁰ The world-wide date is set out five years farther than the U.S. date because the developing nations like China and India are going to take more time to arrest emissions.

C. THE INEXCUSABILITY OF ORPHAN SHARES

⁵⁷ *Id.* at 1937 (“This 1 C limit requires that CO2 should not exceed 450–475 ppm, the exact CO2 limit depending on the level of non-CO2 forcings.”); *id.* at 1950 (noting evidence “that the dangerous level of CO2 can be no more than approximately 450 ppm [and the presence of feedbacks] make it probable that the dangerous level is even lower.”). More recently, at the American Geophysical Conference held in San Francisco in December, Jim Hansen said he believes the figure might be much lower, even 350 parts per million, because of the accelerated melting in the polar regions. See Bill McKibben, *Remember This: 350 Parts Per Million*, WASHINGTON POST (Dec. 28, 2007), <http://www.washingtonpost.com/wp-dyn/content/article/2007/12/27/AR2007122701942.html>.

⁵⁸ See UNION OF CONCERNED SCIENTISTS, A TARGET FOR U.S. EMISSIONS REDUCTIONS (Sept. 2007), available at http://www.ucsusa.org/global_warming/science/emissionstarget.html.

⁵⁹ Because the prescription is calibrated to the 450 ppm threshold, which recent data suggest may be too high to achieve climate stability, even this prescription may be too little too late. One leading thinker asserts that the United States needs to cut carbon 80% by 2020 and sets forth a plan to achieve this goal without additional reliance on nuclear energy. LESTER BROWN, PLAN B 3.0: MOBILIZING TO SAVE CIVILIZATION (Earth Policy Institute 2008).

⁶⁰ Milmo, *supra* note 8.

The third principle has to do with the responsibility of each nation, and each state within each nation, to reduce carbon. The sovereign nations of Earth share the atmosphere as their common property. They are sovereign co-tenant trustees of the atmosphere, all bound by the same duties that organize, for example, the relationship of family members who own a cabin together as co-tenants. Property law has always imposed a responsibility on co-tenants to not degrade, or waste, their common asset.

You can apply this mandate to every nation of the world and create a framework for carbon responsibility. You can imagine the industrialized world's planetary carbon load as one big pie. Even though industrialized nations come in different sizes, if each reduces carbon proportionately by the same amount, the carbon pie as a whole will reduce by that amount. But the contrary is also true: if even one major industrialized nation does not accept its share of carbon reduction, does not reduce its slice of the pie, it will leave an orphan share that will sink all other planetary efforts. The carbon pie will not shrink by the amount it needs to. The U.S. is responsible for 30% of the greenhouse gas emissions on the planet. No other nation on earth is positioned, much less obligated, to adopt an orphan share left by a deadbeat sovereign – especially a share as large as ours.

So this third principle means that, as co-tenant trustees of the atmosphere, all industrial nations must carry out their share of carbon reduction as set forth in the prescription that scientists have provided. Scaling down to another level, this also means that all states, and all cities and counties within states, must carry their burden. It is their fiduciary obligation as trustee. In order to save this planet, we must not excuse any orphan shares.

I recently gave a talk to a class of high school environmental science students in McCall, Idaho, and I told them, the fate of the planet rests on McCall, Idaho, because if you don't take your share of carbon reduction, who will? Do you expect those of us in Eugene, Oregon to take it? We have enough of a challenge with our own share. And unless every share is accounted for, we're not going to decrease the carbon pie enough in the time we have left. That point hit home with those students, and now they, along with elementary and middle school kids, are working very hard to convince their community and their local government to take responsibility for carbon. The next time you see a huge Suburban hauling snowmobiles to McCall, please think of this younger generation. There's nothing wrong about having fun, but given what the scientists say, our gas-guzzling recreation today is subsidized by human death and suffering tomorrow. It's like joyriding over future graves.⁶¹

VI. ARRESTING THE GROWTH OF EMISSIONS: GETTING THERE IN TWO YEARS

⁶¹ Scientists and writers on the subject of global warming clearly link present fossil fuel activities to future human survival. See, e.g. PEARCE, *supra* note 35, at xxiii (“We are interfering with the fundamental processes that make Earth habitable. It is our own survival that is now at stake, not that of a cuddly animal or a natural habitat.”). What is missing, however, is the popular link between present actions and future death. The rhetoric of the day still avoids the term “death,” instead discussing the consequences in less distressing terms such as impaired survival, or loss of habitability.

We must look reality in the face and ask what it will take to arrest the growth in carbon emissions within two years. The most urgent measure is a moratorium in this country against new coal fired plants. Jim Hansen recently gave testimony in an Iowa coal plant proceeding and warned that even one more coal plant with emissions of nearly 6 million tons of CO₂ per year over 50 years could be the “straw that breaks the camel’s back” capable of plunging the planet past the “ice sheet tipping point.”⁶² We are that close. But the hopeful aspect of a society built upon waste is that we can make major cuts without compromising basic needs.

In addition to curbing emissions, it is imperative to protect the natural resources we still have. We must safeguard any remaining carbon sinks that have capacity to cleanse the atmosphere of carbon. That means a halt to extractive forestry, wetland destruction, and industrial farming that damages soils. We have to look at all of our natural resources in a different light, because most of them are now much more valuable functioning in their natural way than being destroyed to profit singular interests. And we need to pour resources into programmatic restoration to provide natural systems with as much resilience as we can.

Nevertheless, I’ll bet you are all thinking, it’s not politically feasible to stop timber sales, sprawling development, and cut back on motorized recreation in Idaho. And you are quite right. The only politically feasible course of action is to send the world into disaster. Now go look those McCall students in the eye and tell them that. That is why we need courageous leaders to voice a new political paradigm, one that offers hope for the next generation.

But many elected officials make policy out of fear rather than courage. They fear that their constituents will resent measures that cut into their lifestyle. This is exactly backwards. Today’s life of convenience will lock us into a future where there is no convenience. Where is the convenience in a family huddled on a rooftop praying that a helicopter will lift them from the floodwaters of Hurricane Katrina? Where is the convenience in residents evacuating 2,000 homes in Ketchum to escape wildfire? Do we find convenience in the 13 year-old boy who died after being washed down a flooded creek during the torrential rains in Texas? It is time to face the fact that we live in a different world than we did just a few years ago. We have to take action now to preserve any semblance of the security and predictability in life that we now take for granted. The choice for government is disaster prevention or disaster relief. This is a chance for politicians to become true leaders, to explain clearly the nature of the threat, and to connect in Americans’ minds the need for short-term investment and regulation in order to avoid long-term calamity. True leaders know how to do that. All other leaders must quickly learn how.

⁶² James E. Hansen, Testimony before the Iowa Utilities Board 7, [http://plainsjustice.org/files/GCU-07-1_Sutherland_Filing/Hansen%20Direct%20Testimony%20\(Public\).pdf](http://plainsjustice.org/files/GCU-07-1_Sutherland_Filing/Hansen%20Direct%20Testimony%20(Public).pdf) (2007). He added:

If we cannot stop the building of more coal-fired power plants, those coal trains will be death trains – no less gruesome than if they were boxcars headed to crematoria, loaded with uncountable irreplaceable species. . . . “*Id.* at 8.

VII. THE CHANGING CULTURE OF SCIENCE

In the final minutes remaining, I'd like to talk about the changing role of scientists operating in this new world. The visionary leaders of all professions are now thinking outside the box, urging paradigm shifts. They are taking to heed Albert Einstein's well-known advice that we can't solve problems with the same thinking that we used to create them. The leading scientists studying climate change are themselves becoming leaders of a climate of change across the entire discipline of science. Many of you are also leaders of change in your field – the challenge is bringing the rest of the field along. I'd like to mention four aspects of this change and how it might affect your work.

A. SPEAKING TO THE BENEFICIARIES

First, scientists are bringing their conclusions to the people – the beneficiaries of the trust – by speaking in terms that convey the urgency and gravity of this crisis. Consider the statement of government scientist Mark Serreze, in releasing new polar ice data in December: “The Arctic is screaming.”⁶³ These kinds of statements wake up a public that would otherwise sleep through traditional scientific summaries. Sound bites are now as important as abstracts.

How does this relate to your work? The beneficiaries of Idaho's great salmon trust need to be informed, immediately, of climate crisis. It doesn't take a fisheries scientist to figure out that many of the fish species in this state are threatened by climate heating, if for no other reason than that they need cold water, lots of it, and that cold water is going to be a scarce commodity in a heating world. The fish – particularly the salmon -- are messengers for climate. While global warming may seem remote and obscure to many Idahoans, fish are tangible, valuable, and symbolic of a way of life. They touch the hearts of Idaho citizens. So as fisheries scientists, you are uniquely positioned to convey the urgency of climate crisis to the Idaho public. When these citizens are confronted with the truth of what is happening, they will feel a moral imperative to act, and they will force their leaders to act. This is a psychological leap forward happening all over the world at once. But it doesn't happen without catalysts.

B. PRESENTING CHOICES TO THE POLICY REALM

A second change is that climate scientists are now translating science into clear policy choices for lawmakers. The Union of Concerned Scientists' report setting forth emissions targets is an example. This report is a major breakthrough because it distills a huge body of climate science into terms that government officials can implement on the ground. Without this quantitatively defined standard of care for the atmosphere, there is no way citizens can hold government accountable.

Let's face that fact that some think scientists have no business speaking in the policy realm. But let's take a page from the physician's desk book. A doctor would not

⁶³Scientist: 'Arctic is Screaming,' CNN (Dec. 11, 2007), <http://www.cnn.com/2007/TECH/science/12/11/arctic.melt.ap/index.html>.

say to a heart patient, “You’re probably going to die in a year if you don’t take some serious action, but have a great day,” and then walk out the door without telling the patient what to do! The doctor would tell the patient to get exercise, cut fat out of the diet, stop smoking, and perhaps even undergo surgery. This is a prescription. Do we accuse the doctor of being too political in giving it? Scientists too must give a prescription in terms both the trustees and the beneficiaries can understand, if science is to have any relevance in this new world.

For fisheries scientists, the prescription can’t stop at water’s edge. Curbing carbon emissions is as crucial to the future of Idaho fisheries as ensuring migration in rivers blocked by dams. Idaho fisheries scientists have as much standing to go before the Idaho state legislature and ask for laws reducing carbon as a doctor has to ask parents of a young asthma patient to stop smoking in the house.

C. RECASTING SCIENTIFIC UNCERTAINTY: THE PRECAUTIONARY APPROACH

The third change involves recasting scientific uncertainty. Scientific uncertainty, of course, reflects the core of scientific honesty. But it has become fodder for political manipulation by powerful interests. The argument usually goes like this: unless we are 100 % certain that pollution is having a harmful effect, we should not force any changes to our polluting industries because doing so will involve economic costs, which are clear and tangible. Some salmon species in this basin have been studied, literally, to death because scientific uncertainty was misused in this way to block migration and habitat improvements.

The answer to the quandary is not eliminating scientific uncertainty. I don’t know how you could do that and keep scientific methodology on an honest track. Instead, some of the leading climate scientists are voicing scientific uncertainty to support a precautionary approach.⁶⁴ That principle has a simple premise: “When an activity raises threats of harm to . . . the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically.”⁶⁵

In the world of climate change, where more is uncertain than certain, the precautionary principle is essential. And here too, somehow physicians manage the context of uncertainty pretty well. Doctors will rarely say they are 100% certain of their diagnosis, but that fact does not normally cause the patient to scoff at the doctor’s orders. This paradigm shift may be easier than we think if we simply tap into common sense wisdom that we all grow up with. Didn’t your grandmother ever tell you to “Look

⁶⁴ For an example of applying the precautionary approach to climate science, see Jim Hansen, *Climate Catastrophe*, NEW SCIENTIST 30 (July 28, 2007) (discussing sea level rise prediction and uncertainty).

⁶⁵ Wingspread Statement on the Precautionary Principle (Jan. 1998), <http://www.gdrc.org/u-gov/precaution-3.html>.

before you leap,” “Better safe than sorry?”⁶⁶

D. SHIELDING SCIENCE AGAINST POLITICS

The fourth and final change is that climate scientists working in government agencies are the front soldiers in a battle to protect the integrity of science itself. Their science has become the target of political manipulation and suppression unlike anything experienced before in this country. In December, 2007, the U.S. House of Representatives Committee on Oversight and Government Reform issued a report entitled Political Interference with Climate Change Science Under the Bush Administration, in which it found “a systematic White House effort to censor climate scientists by controlling their access to the press and editing testimony to Congress. . . . The White House . . . sought to minimize the significance and certainty of climate change by extensively editing government climate reports.”⁶⁷

Many political appointees were involved in this suppression of truth, but the one with the dirtiest fingerprints was Philip Cooney, who served as Chief of Staff of the White House Council on Environmental Quality.⁶⁸ Prior to that he was a lawyer working for 15 years for the American Petroleum Institute.⁶⁹ In 2005, he altered key government climate reports to downplay scientific consensus on climate change. Shortly thereafter, he resigned from his government post to join Exxon.

Do we need to point out that this effort to suppress science is not limited to the climate realm? Do we find any parallels with Senator Larry Craig’s action to defund the Fish Passage Center?

It’s not hard to figure out what is causing this assault on science. One of the most venerable principles of trust law is that the trustee must have undivided loyalty to the beneficiaries of the trust. We must remember that the American public owns these natural assets. We are the beneficiaries of the trust. But many of the political appointees in federal agencies today have been handpicked from the fossil fuel industries for the singular purpose using the laws and resources of the federal government to benefit those industries. To them, their conflict of interest is their fiduciary standard of care.

But climate scientists are fighting back to champion the truth. Jim Hansen risked his job to speak directly to the public and the press. But one person can’t shoulder this battle alone. It will take the entire scientific community to create a culture of intolerance for scientific suppression. Squadrons of scientists are now defending truth and democracy. On one front, the Union of Concerned Scientists has assembled 12,000

⁶⁶ For background on the Precautionary Principle, *see* CAROL RAFFENSPERGER AND JEFF TICKNER, PROTECTING PUBLIC HEALTH AND THE ENVIRONMENT: IMPLEMENTING THE PRECAUTIONARY PRINCIPLE (Island Press 1999).

⁶⁷ United States House of Representatives Committee on Oversight and Government Reform, Political Interference With Climate Change Science 32 (Dec. 2007).

⁶⁸ *Id.* at 16.

⁶⁹ His job before coming to government was “to ensure that any governmental actions taken relating to climate change were consistent with the goals of the petroleum industry.” *Id.*

scientists behind a statement accusing the Bush administration of political interference.⁷⁰ On another front, 10,000 EPA scientists – over half of the agency’s total workforce – acted through their union leaders to petition Congress to end censorship of agency scientists.⁷¹ When I read through the history of the Idaho Chapter of the American Fisheries Society, I see that same professional camaraderie and fierce loyalty to truth that is key to holding the line against political interference.

VIII. THE THRESHOLD

I would like to end with a quote from author Ross Gelbspan, who has been a leading thinker on climate for years. On December 11, at 4:03 in the morning, he posted an essay on the blog Gristmill – he called it *Beyond the Point of No Return*. In it, he reviewed the horrifying evidence of climate change, described a “panic among climate scientists,” and then concluded:

There is no body of expertise – no authoritative answers – for this one. We are crossing a threshold into uncharted territory. And since there is no precedent to guide us, we are left with only our own hearts to consult, whatever courage we can muster, our instinctive dedication to a human future – and the intellectual integrity to look reality in the eye.⁷²

Somehow fate has delivered all of us into this pivotal moment on Earth. We did not live 100 years ago, when it was too early to even imagine the collapse upon us, and we will not be here 100 years from now when it will be too late to save what we still can. We can only claim this moment.

As you go forth in this conference, my greatest hope for you is that you confront with courage and vision the reality of today, even though it means shedding the familiar assumptions and paradigms of yesterday; that you approach your jobs with a resolute sense of urgency; that you find strength in your purpose as a champions of truth in a world subject to unknown laws of Nature; and, most importantly, that you find the true bearings of your work not in the statements of powerful vested interests or the politicians that represent them, but in the sheer wonder of children seeing a huge steelhead landed out of a small stream -- and that, in their innocent hope and rightful expectation, you will find deeper inspiration than you have ever known to leave those beneficiaries the natural trust that they need for their moment on this Earth.

Thank you.

⁷⁰ Union of Concerned Scientists, *Restoring Scientific Integrity in Policy-Making*, http://www.ucsusa.org/scientific_integrity/interference/scientists-signon-statement.html.

⁷¹ Public Employees for Environmental Responsibility, *EPA Scientists File Mass Petition for Action on Global Warming* (news release) (Nov. 29, 2006), http://www.peer.org/news/news_id.php?row_id=789.

⁷² Ross Gelbspan, *Beyond the Point of No Return*, GRISTMILL (Dec. 11, 2007), <http://gristmill.grist.org/story/2007/12/10/165845/92>.

