Climate Change and the Judge as Water Trustee

by Michael D. Wilson

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Something extraordinary is happening. Through the carbon emissions from burning fossil fuel and deforestation, humans have disrupted earth's climate system, leading to global warming. The challenge we now face is to stop these emissions and limit the extent of warming and the associated loss, damage, and harm to people and ecosystems. Failure to mitigate these emissions will lead to irreversible impacts and a planet so damaged it will be biologically impoverished, provide less freshwater, grow less agriculture, produce more diseases, and kill unprecedented millions of people with storms, heat waves, coastal inundation, flooding, and fires. This is as we head toward a world population projected to grow from 7.4 billion to 11.2 billion by 2100.[1]

The catastrophic future that the Paris Agreement[2] is intended to save us from will arrive by the time the earth warms two degrees above its pre-industrial temperature—a ceiling we are already rapidly approaching.[3] A more pronounced catastrophe distinguished by a world of 3+ degrees of global warming by 2100 is now the more likely future for humanity based on present levels of carbon emissions.[4]

Humanity's quest to achieve orderly mitigation of and adaptation to climate change is dependent upon the just application of the environmental rule of law—the legal framework that protects and sustains the environment on which life depends. A 3+ degree world of collapsing ecosystems will arrive within the century, unless the environmental rule of law is enforced. This Comment posits that the present framework positions earth's judges as guardians of the public trust—sworn to protect earth's water resources from the severe damage that will be caused by heating the earth system two to three degrees above pre-industrial levels.

Environmental courts and tribunals are proving to be critical to the world judiciary's just application of the environmental rule of law to issues of climate change. To further equip the judges who must apply the environmental rule of law, Brazil Supreme Court Justice Antonio Benjamin, in collaboration with the World Commission on Environmental Law, the United Nations Environment Programme (UNEP), and the Organization of American States, has led the establishment of the Global Judicial Institute on the Environment (GJIE). These institutions fortify the world judiciary as it performs its public trust duty to protect humanity and the ecological integrity of earth through responsible, resilient application of the environmental rule of law. Through the empowering framework of environmental courts and the GJIE, judges will be trained to apply the environmental rule of law in our Anthropocene era of climate change.

I. Humanity Notices Climate Change: The Big Picture

The need for judicial institutions to address climate change is apparent. Humanity is demanding solutions. Large-scale demonstrations have become commonplace. The largest single gathering in history to protest climate change was the People's Climate March on September 21, 2014, when an estimated 311,000 participants marched at the United Nations (U.N.) in New York City.[5] At the same time, marches were conducted throughout the world, including Amsterdam, Berlin, London, New Delhi, and Rio. During

1. Department of Economic and Social Affairs, United Nations, World Population Prospects: The 2015 Revision (2015) (ESA/P/WP.241), *available at* https://esa.un.org/unpd/wpp/publications/files/key_findings_wpp_2015.pdf.
2. Paris Agreement, U.N. Doc. FCCC/CP/2015/L.9/Rev.1 (Dec. 12, 2015), *available at* http://unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf.
3. Eric Holthaus, *Our Planet's Temperature Just Reached a Terrifying Milestone*, Slate (Mar. 12, 2016), http://www.slate.com/blogs/future_tense/2016/03/01/february_2016_s_shocking_global_warming_temperature_record.html; *see also* National Aeronautics and Space Administration, *Global Temperature*, https://climate.nasa.gov/vital-signs/global-temperature/ (last updated Jan. 12, 2018).
4. United Nations Environment Programme (UNEP), The Emissions Gap Report 2017: A UN Environment Synthesis Report (2017), *available at* http://wedocs.unep.org/handle/20.500.11822/22070.
5. Lisa W. Foderaro, *Taking a Call for Climate Change to the Streets*, N.Y. Times (Sept. 21, 2014), https://www.nytimes.com/2014/09/22/nyregion/new-york-city-climate-change-march.html.

the 2015 United Nations Conference of the Parties (COP 21) in Paris, more than 600,000 people marched in 175 countries.[6] On April 29, 2017, an estimated 200,000 climate change protesters marched in Washington, D.C.[7]

Consistent with the views of the many marchers, a growing number of iconic figures have declared climate change to be the preeminent problem facing humanity. China's President Xi Jinping highlighted climate change in his address to the U.N. in Geneva on January 18, 2017: "We should make our world clean and beautiful by pursuing green and low-carbon development. . . . Industrialization has created material wealth never seen before, but it has also inflicted irreparable damage to the world."[8] At the Paris climate summit in 2014, then-President Barack Obama labeled climate change as the "one issue that will define the contours of this century more dramatically than any other."[9] The chancellor of Germany, Angela Merkel, stated at the November 2017 United Nations Climate Change Conference in Bonn, Germany: "climate change is an issue determining our destiny as mankind."[10]

Pope Francis' message to 1.2 billion Catholics in his June 2015 encyclical on the environment described climate change as "one of the principal challenges facing humanity in our day."[11] It represents a rupture of the relationship between humanity and the earth that "is sin."[12] One of the world's most renowned scientists, Stephen Hawking, described "runaway" human-caused climate change as the greatest threat facing the world: "A rise in ocean temperature would melt the ice-caps, and cause a release of large amounts of carbon dioxide from the ocean floor. Both effects could make our climate like that of Venus, with a temperature of 250 degrees."[13] E.O. Wilson, professor emeritus of the Entomology Department at Harvard University, offers a similar view of "human-forced climate change," calling it "the great, wrathful demon that threatens all our lives."[14]

Underlying the preeminent attention paid to climate change by leaders from the political, economic, scientific, and religious sectors is the immediacy of its peril. Conservation biologist Thomas Lovejoy, the originator of the term "biodiversity," warns that at two degrees global warming, "there undoubtedly will be massive extinctions and widespread ecosystem collapse."[15]

An obvious consequence of the collapse of ecosystems will be social unrest, including fights for water. The president of the World Bank, Jim Yong Kim, has noted "fights over water and food are going to be the most significant direct impacts of climate change in the next five to ten years. There's just no question about it."[16]

No one can predict the future with certainty. Yet a formidable consensus of the world scientific community has provided convincing evidence to world leaders of the severe consequences of maintaining the current level of greenhouse gas/carbon emissions. The most reliable projections of future climate impacts are those generated from global climate change models that simulate the earth system and human interventions on key natural processes. The Intergovernmental Panel on Climate Change (IPCC) was established to review current scientific knowledge about climate change and provide regular reports to the world community. The IPCC's conclusions are "conservative" in that they represent published, peer-reviewed science and what has been established as reliable scientific knowledge to date.

These IPCC conclusions are unqualified, they have been formally accepted by the world's national governments,[17] and thus they can be considered, both scientifically and politically, as "known facts." They cannot be dismissed or ignored if one is committed to an evidence-based approach to public policy and the environmental rule of law. They are the scientific authority upon which all but one (the United States) of the world's nations have committed to reduce

6. Claire Phipps et al., *Global Climate March 2015: Hundreds of Thousands March Around the World—As It Happened*, Guardian (Dec. 1, 2015), https://www.theguardian.com/environment/live/2015/nov/29/global-peoples-climate-change-march-2015-day-of-action-live.
7. *Peoples Climate March a Huge Success: 200,000+ March in D.C. for Climate, Jobs, and Justice*, 350.org (Apr. 29, 2017), https://350.org/press-release/peoples-climate-march-a-huge-success-200000-march-in-d-c-for-climate-jobs-and-justice.
8. Tom Phillips, *China's Xi Jinping Says Paris Climate Deal Must Not Be Allowed to Fail*, Guardian (Jan. 18, 2017), https://www.theguardian.com/world/2017/jan/19/chinas-xi-jinping-says-world-must-implement-paris-climate-deal.
9. President Barack Obama, Remarks at U.N. Climate Change Summit (Sept. 23, 2014), https://obamawhitehouse.archives.gov/the-press-office/2014/09/23/remarks-president-un-climate-change-summit.
10. Damian Carrington, *Climate Change Will Determine Humanity's Destiny, Says Angela Merkel*, Guardian (Nov. 15, 2017), https://www.theguardian.com/environment/2017/nov/15/climate-change-will-determine-humanitys-destiny-says-angela-merkel.
11. Pope Francis, Encyclical Letter, Laudato Si' (2015), *available at* http://w2.vatican.va/content/dam/francesco/pdf/encyclicals/documents/papa-francesco_20150524_enciclica-laudato-si_en.pdf.
12. *Id.* at 48.
13. Emily Atkin, *The Media Is Ignoring the Most Important Part of Stephen Hawking's Comments on Trump*, ThinkProgress (May 31, 2016), https://thinkprogress.org/the-media-is-ignoring-the-most-important-part-of-stephen-hawkings-comments-on-trump-d97a5fdbf55.
14. Edward O. Wilson, *The Global Solution to Extinction*, N.Y. Times (Mar. 12, 2016), https://www.nytimes.com/2016/03/13/opinion/sunday/the-global-solution-to-extinction.html.
15. Thomas E. Lovejoy, *The Climate Change Endgame*, N.Y. Times (Jan. 21, 2013), http://www.nytimes.com/2013/01/22/opinion/global/the-climate-change-endgame.html. With the arrival of two degrees of warming, climate change will not only bring massive die-off of earth's plant and animal species—increases in infectious diseases such as cholera, malaria, dengue fever, Lyme disease, bird flu, Ebola, and tuberculosis will also occur. Xiaoxu Wu et al., *Impact of Climate Change on Human Infectious Diseases: Empirical Evidence and Human Adaptation*, 86 Env't Int'l 14-23 (2016), *available at* http://www.sciencedirect.com/science/article/pii/S0160412015300489.
16. Larry Elliott, *Climate Change Will "Lead to Battles for Food," Says Head of World Bank*, Guardian (Apr. 3, 2014), https://www.theguardian.com/environment/2014/apr/03/climate-change-battle-food-head-world-bank.
17. The IPCC was established by UNEP and the World Meteorological Organization (WMO) in 1988 to provide the world with a clear scientific view on the current state of knowledge in climate change and its potential environmental and socioeconomic impacts. In the same year, the U.N. General Assembly endorsed the action by WMO and UNEP in jointly establishing the IPCC. Membership of the IPCC is open to all Member countries of the United Nations and WMO. Currently, 195 countries are Members of the IPCC. *See* IPCC, *Organization*, http://www.ipcc.ch/organization/organization.shtml (last visited Jan. 12, 2018).

carbon emissions through the 2015 Paris Agreement of the U.N. Framework Convention of Climate Change[18]

II. Water Resources in a Two- to Three-Degree World

Yet, at the most recent United Nations Climate Change Conference, in November 2017, it was acknowledged that current mitigation commitments fall short of those needed to limit global warming to below two degrees by 2100. No longer are judges applying the environmental rule of law with the impending catastrophe of a two-degree world. Unless the level of carbon emissions is reduced, the natural resources of earth, particularly water, will succumb to the effects of 3+ degrees global warming by 2100.[19]

A three-degree world is difficult to imagine. It requires careful study. At present, understanding the enormity of the degradation to ecosystems is limited to those, such as scientists, who are able to fathom the severity of the silent incremental release of carbon dioxide into the atmosphere, the alterations this causes to natural processes, and the quiet demise of nearly half of life on earth.[20] Judges by occupation will also be tasked with understanding a 3+ degree world in order to decide whether conduct that causes such a world is consistent with the environmental rule of law.

The evidence of extreme irreparable injury is compelling. On the current business-as-usual trajectory of carbon emissions, much of earth's surface will be uninhabitable because it will lack sufficient water resources and be subject to temperatures of 50 degrees Celsius, or 122 degrees Fahrenheit.[21] In some regions, forests such as the Amazon will suffer drought and ignite, sending carbon into the air to contribute to a robust self-sustaining cycle of increased carbon dioxide—a cycle that spawns higher temperatures and diminishing water resources.[22] Rainfall in Central America and Mexico would decline by 50%.[23] Deserts will spread throughout Europe, and the Alps will have no glaciers.[24] Much of Honolulu, Miami, Osaka, Rio de Janeiro, and Shanghai will be submerged.[25] Added heat will cause equatorial megacities such as Karachi and Kolkata to become nearly uninhabitable.[26] Climate refugees are projected to be in the hundreds of millions.[27] As the most vulnerable part of humanity, hundreds of millions of children will die.[28] We presently have two billion children on earth, nearly half of them poor.[29]

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18. UN Climate Change, Paris Agreement Status of Ratification; http://unfccc.int/paris_agreement/items/9444.php.
19. Brad Plumer, *At Bonn Climate Talks, Stakes Get Higher in Gamble on Planet's Future*, N.Y. Times (Nov. 18, 2017), https://www.nytimes.com/2017/11/18/climate/un-bonn-climate-talks.html:
    > Virtually everyone at the Bonn conference acknowledged that the world's nations are still failing to prevent drastic global warming in the decades ahead. "We need more action, more ambition, and we need it now," said Patricia Espinosa, the United Nations climate chief. Under the Paris agreement, nearly every country submitted a voluntary pledge for constraining its emissions. Yet those pledges are modest: even with them, the world is still on course to warm at least 3 degrees Celsius (5.4 degrees Fahrenheit) this century, an outcome that carries far greater risks of destabilizing ice sheets in Greenland and Antarctica, drastic sea-level rise and more extreme heat waves and droughts.

    The Three-Degree World: The Cities That Will Be Drowned by Global Warming, Guardian (Nov. 3, 2017) [hereinafter *The Three-Degree World*], https://www.theguardian.com/cities/ng-interactive/2017/nov/03/three-degree-world-cities-drowned-global-warming ("Until now, global efforts such as the Paris climate agreement have tried to limit global warming to 2C above pre-industrial levels. However, with latest projections pointing to an increase of 3.2C by 2100, these goals seem to be slipping out of reach."); *see also* U.S. Global Change Research Program, Climate Science Special Report: Fourth US National Climate Assessment Vol. 1, 17 (2017), *available at* https://science2017.globalchange.gov/downloads/CSSR2017_FullReport.pdf ("Without major reductions in emissions, the increase in annual average global temperature relative to preindustrial times could reach 9°F (5°C) or more by the end of this century."); David Spratt, *What Would 3 Degrees Mean?*, Climate Code Red (Sept. 1, 2010), http://www.climatecodered.org/2010/09/what-would-3-degrees-mean.html ("The failure of international climate negotiations means that if all countries acted on ALL their commitments, the world would still warm by more than 3 degrees, according to Climate Tracker.").
20. Ian Johnston, *Half the World's Species Failing to Cope With Global Warming as Earth Races Towards Its Sixth Mass Extinction*, Independent (Dec. 8, 2016), http://www.independent.co.uk/environment/climate-change-global-warming-mass-extinctions-species-study-donald-trump-kill-himself-joke-a7464391.html.
21. Stephen Leahy, *Parts of Asia May Be Too Hot for People by 2100*, Nat'l Geographic (Aug. 2, 2017), https://news.nationalgeographic.com/2017/08/south-asia-heat-waves-temperature-rise-global-warming-climate-change.
22. Spratt, *supra* note 19:
    > As the Arctic continue[s] to warm, melting permafrost in the boreal forests and further north in the Arctic tundra is now starting to melt, triggering the release of methane, a greenhouse gas twenty times more powerful than CO_2, from thick layers of thawing peat. The West Siberian bog is estimated to contain 70 billion tonnes of CO_2. Prof. Sergei Kirpotin, a botanist at Russia's Tomsk State University, says: "There's a critical barrier . . . Once global warming pushes the melting process past that line, it begins to perpetuate itself." The West Antarctic ice sheet would likely [be lost] to irreversibly melting[.]
23. *Id.*
24. Charles H. Fletcher, University of Hawai'i at Mānoa, Where Is Climate Change Leading Us? 15-16; Bloomberg News, *Snow-Covered Alps No More? 70 Percent of Snow, Glaciers Could Be Gone by 2100*, Denver Post, Feb. 16, 2017, https://www.denverpost.com/2017/02/16/climate-change-alps-no-snow.
25. *The Three-Degree World*, *supra* note 19.
26. *Kolkata to Remain World's Most Heat Stressed City This Century*, Skymet Weather (Mar. 31, 2017), https://www.skymetweather.com/content/climate-change/kolkata-to-remain-worlds-most-heat-stressed-city-this-century; *see* Saba Imtiaz & Zia ur-Rehman, *Death Toll From Heat Wave in Karachi, Pakistan, Hits 1,000*, N.Y. Times (June 25, 2015), https://www.nytimes.com/2015/06/26/world/asia/karachi-pakistan-heat-wave-deaths.html.
27. As explained by Erich M. Fischer & Reto Knutti:
    > [T]he amount of warming to date . . . has already multiplied the number of places experiencing dangerous or extreme heat waves by 50 times. . . . Global warming over the last century means heat extremes that previously only occurred once every 1,000 days are happening four to five times more often.

    Erich M. Fischer & Reto Knutti, *Anthropogenic Contribution to Global Occurrence of Heavy-Precipitation and High Temperature Extremes*, 5 Nature Climate Change 560-65 (2015); Fletcher, *supra* note 24, at 13.
28. For example:
    > [Approximately] 1.1 billion people worldwide lack access to water, and a total of 2.7 billion find water scarce for at least one month of the year. Inadequate sanitation is also a problem for 2.4 billion people—they are exposed to diseases, such as cholera and typhoid fever, and other water-borne illnesses. Two million people, mostly children, die each year from diarrheal diseases alone.

    World Wildlife Fund, *Water Scarcity*, https://www.worldwildlife.org/threats/water-scarcity (last visited Jan. 12, 2018).
29. United Nations Children's Fund, *Children Living in Poverty*, https://www.unicef.org/sowc05/english/poverty.html (last visited Jan. 12, 2018) ("Number of children in the world: 2.2 billion. Number of children living in developing countries: 1.9 billion. Number of children living in poverty: 1 billion—every second child.").

III. Environmental Rule of Law Will Prevent a Two- to Three-Degree World

Lovejoy—a renowned biodiversity scientist who understands the impending two- to three-degree world—posed the question: "Can we avoid the greatest intergenerational environmental injustice of all time?"[30] Will present generations perpetrate a self-indulgent two- to three-degree future for tomorrow's children by knowingly releasing carbon into the atmosphere? The present framework of the environmental rule of law protects future generations from the environmental injustice of a 2-3 degree earth. The rubric of constitutional and statutory law shaping earth's water future is replete with rights to a clean and healthy environment, and the fundamental public trust duty of government to protect natural resources for future generations.

The capacity of judicial institutions to contend with the impending consequences of climate change within the framework of environmental law is proving to be strong and resilient. Contemporary principles have arisen, empowering judges to address the rapid onset of climate change through evolved environmental rules of law. Intergenerational equity, public trust, the precautionary principle, the prevention principle, the right to a clean and healthy environment, polluter-pays, and the doctrine of "danger creation" are the propitious progeny of many foundational legal devices—including Principle 1 of the 1992 Rio Declaration,[31] Sustainable Development Climate Action Goal 13 of the 2015 United Nations Sustainable Development Summit, and, most recently, the nationally determined contributions to carbon mitigation established by 173 Parties who have ratified the Paris Agreement to date.

Intergenerational equity was recognized by the Supreme Court of the Philippines to grant standing to children who represented the interests of future generations in protected forests that were the subject of large-scale illegal deforestation.[32] The constitutional right to a healthy environment was recognized by the Supreme Court of India as early as 1991.[33] The right of the sacred Ganga and Yamuna Rivers to legal protection as "legal persons/living persons" was recently established by the High Court of the state of Uttarakhand in India.[34] The court found the rivers to "have spiritual and physical sustenance. They support and assist both the life and natural resources and health and well-being of the entire community. Rivers Ganga and Yamuna are breathing, living and sustaining the communities from mountains to sea."[35]

The Indian court's decision was grounded upon Articles 48-A and 51A(g) of the Constitution of India, which provide that the state "shall endeavor to protect and improve the environment and to safeguard the forests and wild life of the country" and that citizens of India have the duty "to protect and improve the natural environment including forests, lakes, rivers and wild life, and to have compassion for living creatures," respectively. A public trust facsimile was identified in the responsible public officials:

> The Director NAMAMI Gange, the Chief Secretary of the State of Uttarakhand and the Advocate General of the State of Uttarakhand are hereby declared *persons in loco parentis* as the human face to protect, conserve and preserve Rivers Ganga and Yamuna and their tributaries. These Officers are bound to uphold the status of Rivers Ganges and Yamuna and also to promote the health and well being of these rivers.[36]

The hegemony of contemporary environmental law has been applied by judges who command an understanding of emerging environmental science and the social consequences of conduct that causes earth's land, air, and water to heat above two degrees from pre-industrial levels. Water for agriculture received protection in Pakistan from government action that failed to address the effects of climate change. The Lahore High Court of the Federation of Pakistan identified climate change as "a defining challenge of our time," which has "resulted in heavy floods and droughts, raising serious concerns regarding water and food security," and representing "a clarion call for the protection of fundamental rights of the citizens of Pakistan."[37] In response to the claim of an "agriculturalist" that the government was not fulfilling its duty to prepare a national climate change policy, Judge Syed Mansoor Ali Shah ordered the convening of government ministries to prepare such a policy. Most recently, Judge Shah established by court order a Standing Committee on Climate Change "which will act as a link between the Court and the Executive."[38]

30. Lovejoy, *supra* note 15.
31. "Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature." *Rio Declaration on Environment and Development*, U.N. Conference on Environment and Development, Rio de Janeiro, Brazil, June 3-14, 1992, Principle I, U.N. Doc. A/CONF.151/26 (1992).
32. Oposa v. Factoran, G.R. No. 101083, 33 I.L.M. 173 (S.C. July 30, 1993), http://www.lawphil.net/judjuris/juri1993/jul1993/gr_101083_1993.html.
33. The Court found:
    > Right to live is a fundamental right under Art. 21 of the Constitution and it includes the right of enjoyment of pollution free water and air for full enjoyment of life. If anything endangers or impairs that quality of life in derogation of laws, a citizen has right to have recourse to Art. 32 of the Constitution for removing the pollution of water or air which may be detrimental to the quality of life.

    Kumar v. State of Bihar, A.I.R. 1991 S.C. 420, http://www.globalhealthrights.org/wp-content/uploads/2013/10/Kumar-India-1991.pdf.
34. Salim v. State of Uttarakhand, Writ Petition (PIL) No. 126 of 2014, decided on Mar. 20, 2017, https://www.nonhumanrightsproject.org/content/uploads/WPPIL-126-14.pdf. The Whanganui River in New Zealand was likewise recently granted legal personhood status in recognition of the local Māori Tribe's belief that the river is an ancestor. In the words of the tribe's lead negotiator, treating the river as a person "is not an anti-development, or anti-economic use of the river but [means] to begin with the view that it is a living being, and then consider its future from that central belief." Eleanor Ainge Roy, *New Zealand River Granted Same Legal Rights as Human Being*, Guardian, Mar. 16, 2017, https://www.theguardian.com/world/2017/mar/16/new-zealand-river-granted-same-legal-rights-as-human-being.
35. *Salim*, Writ Petition (PIL) No. 126 of 2014.
36. *Id.*
37. Leghari v. Federation of Pakistan, W.P. No. 25501/2015 (Lahore High Court, Sept. 4, 2015), *available at* https://elaw.org/pk_Leghari.
38. *Id.*

Recognition of the judicial duty to hear the claims of citizens injured by government's failure to provide protection from carbon-caused climate change is a bellwether of the role of judges contending with the urgency of climate change cases. In Europe, the judges of The Hague District Court also recognized the court's jurisdiction to consider whether the Dutch government met its duty to protect citizens from carbon-caused climate change. In *Urgenda Foundation v. State of the Netherlands*,[39] the court found that, due to the alleged failure of the Dutch government to comply with its carbon mitigation responsibilities, the Urgenda Foundation had standing to assert claims on behalf of Dutch citizens. The court's decision was grounded upon recognition that the alleged failure of the government was a violation of a public trust responsibility to protect its citizens from the imminent danger[40] caused by carbon-caused warming of the atmosphere.

The "danger creation" analysis has been criticized as a deviation from the traditional requirement of tort law that causation be established between the defendant's act and the damage suffered. Under this analysis, Urgenda's claim should fail because there is no direct causal connection between Dutch emissions and the global problem being created primarily by countries with much larger carbon emissions. However, The Hague District Court recognized that climate change is a problem that eludes traditional tort analysis because of its large-scale, generalized impacts:

> It is an established fact that climate change is occurring partly due to the Dutch greenhouse gas emissions. It is also an established fact that the negative consequences are currently being experienced in the Netherlands, such as heavy precipitation, and that adaptation measures are already being taken to make the Netherlands "climate-proof." Moreover, it is established that if the global emissions, partly caused by the Netherlands, do not decrease substantially, hazardous climate change will probably occur. In the opinion of the court, the possibility of damages for those whose interests Urgenda represents, including current and future generations of Dutch nationals, is so great and concrete that given its duty of care, the State must make an adequate contribution, greater than its current contribution, to prevent hazardous climate change.[41]

In the United States, one judge found that future generations have a fundamental right under the U.S. Constitution to a climate system capable of sustaining human life.[42] This right was held to be a "fundamental right" under the Due Process Clause of the Fifth Amendment to the Constitution; the right constitutes "quite literally the foundation 'of society, without which there would be neither civilization nor progress.'"[43] Any compromise of that right by government action or inaction is subject to a "strict scrutiny" standard of review.[44] Judge Ann Aiken of the U.S. District Court for the District of Oregon applied this analysis[45] to permit suit against the U.S. government by an organization of students who represented future generations allegedly injured by the government's failure to adequately regulate greenhouse gases.[46]

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39. Case No. C/09/456689/HA ZA 13-1396 (The Hague District Court, Chamber for Commercial Affairs, June 24, 2015), *available at* http://www.globalhealthrights.org/wp-content/uploads/2016/03/Urgenda-Foundation-v-State-of-Netherlands.pdf.
40. *Id*. at ¶ 4.16.
    > It is not disputed between the Parties that dangerous climate change has severe consequences on a global and local level. The IPCC has reported that the ice at the North and South Poles as well as alpine glaciers are melting due to global warming, which will result in a rise in sea levels. Moreover, the warming of the oceans is expected to result in increased hurricane activity, expansion of desert areas and the extinction of many animal species because of the heat, the latter causing a decline in biodiversity. People will suffer damage to their living environment because of these changes, for instance, a deterioration of food production. Furthermore, the temperature rise will lead to heat related deaths, particularly among the elderly and children. The IPCC reports also state that the current temperature rise causes damage to man and the environment. The 2° C target, also assumed by the Netherlands, is intended to prevent climate change from becoming irreversible: without intervention, the aforementioned processes will become unstoppable.
41. *Id*. at ¶ 4.89.
42. *See* Juliana v. United States, 217 F. Supp. 3d 1224, 1250, 46 ELR 20072 (D. Or. 2016), *motion to certify appeal denied*, No. 6:15-CV-01517-TC, 2017 WL 2483705 (D. Or. June 8, 2017):
    > Exercising my "reasoned judgment" . . . I have no doubt that the right to a climate system capable of sustaining human life is fundamental to a free and ordered society. Just as marriage is the "foundation of the family," a stable climate system is quite literally the foundation "of society, without which there would be neither civilization nor progress."
43. *Id*. (quoting Maynard v. Hill, 125 U.S. 190, 211 (1888)) (citing Oposa v. Factoran, G.R. No. 101083, 33 I.L.M. 173, 187-88 (S.C. July 30, 1993) (without "a balanced and healthful ecology," future generations "stand to inherit nothing but parched earth incapable of sustaining life")).
44. *Id*. at 1248-49 ("When the government infringes a 'fundamental right,' however, a reviewing court applies strict scrutiny. . . . Substantive due process 'forbids the government to infringe certain "fundamental" liberty interests *at all*, no matter what process is provided, unless the infringement is narrowly tailored to serve a compelling state interest.'").
45. Judge Aiken referred to the *Urgenda* case:
    > Assuming plaintiffs are correct that the United States is responsible for about 25% of the global CO_2 emissions, the court cannot say, without the record being developed, that it is speculation to posit that a court order to undertake regulation of greenhouse gas emissions to protect the public health will not effectively redress the alleged resulting harm. The impact is an issue for the experts to present to the court after the case moves beyond the pleading stage. And although this court has no authority outside of its jurisdiction, it is worth noting that a Dutch court, on June 24, 2015, did order a reduction of greenhouse gas emissions nationwide by at least 25% by 2020. See Urgenda Foundation v. The State of The Netherlands, The Hague District Court, Chamber for Commercial Affairs, Case No. C/09/456689/HA ZA 13-1396 (June 24, 2015) (http://deeplink.rechtspraak.n1/uitspraak?id=ECLI:NL:RBDHA:2015:7196) (rejecting arguments that a reduction of Netherlands' emissions would be ineffectual in light of other nations' practices, observing that "The state should not hide behind the argument that the solution to the global climate problem does not depend solely on Dutch efforts. Any reduction of emissions contributes to the prevention of dangerous climate change and as a developed country the Netherlands should take the lead in this."). Thus, regulation by this country, in combination with regulation already being undertaken by other countries, may very well have sufficient impact to redress the alleged harms.

    Id. at 1269.
46. The children allege that the federal government knew that greenhouse gas emissions were destabilizing the climate system and that the government's failure to act on climate change "violate[s] their substantive due process rights to life, liberty, and property," and that the government has "violated their obligation to hold certain natural resources in trust for the people and for future generations." *Id*. at 1233. In November, the court issued an order denying defendants and intervenors' motion to dismiss. *Id*. The court noted

Injuries attributed to climate change by the students in their complaint included polluted water and drought.[47] Injury from climate change flooding was also alleged by 13-year-old Jayden F.:

> Flood waters were pouring into our home through every possible opening. We tried to stop it with towels, blankets, and boards. The water was flowing down the hallway, into my Mom's room and my sisters' room. The water drenched my living room and began to cover our kitchen floor. Our toilets, sinks, and bathtubs began to overflow with awful smelling sewage because our town's sewer system also flooded. Soon the sewage was everywhere. We had a stream of sewage and water running through our house.[48]

The court rejected the government's contention that the plaintiffs' injuries were "nonjusticiable generalized injuries . . . not particular to plaintiffs because they are caused by climate change, which broadly affects the entire planet (and all people on it) in some way."[49] Judge Aiken emphasized the particular and concrete nature of the injuries alleged: "Applying the correct formulation of the generalized grievance rule, plaintiffs' alleged injuries—harm to their personal, economic and aesthetic interests—are concrete and particularized, not abstract or indefinite."[50]

The court concluded that the plaintiffs did have standing because "[U.S. Environmental Protection Agency's] action/inaction with respect to the regulation of greenhouse gases allegedly results in the numerous instances of emissions that purportedly cause or will cause the plaintiffs harm."[51] It noted that "to hold otherwise would be to say that the Constitution affords no protection against a government's knowing decision to poison the air its citizens breathe or the water its citizens drink. Plaintiffs have adequately alleged infringement of a fundamental right."[52]

The alleged failure of the government to prevent life-threatening damage to ecosystems upon which the plaintiffs depended also constituted a violation of the government's public trust duty under the Fifth Amendment's Due Process Clause.[53] Judge Aiken noted the split of authority within the federal judiciary as to whether the public trust doctrine applies to the federal government.[54] As the conditions of a 2-3 degree world approach, the discourse in favor of the federal government being without a public trust duty may lessen. As the archetypal peril of earth with collapsing ecosystems approaches, legal narratives limiting judicial review of alleged government causation of carbon-caused global warming will become anachronisms.[55]

The *Juliana* court's recognition of the plaintiffs' substantive due process and public trust claims on behalf of future generations is consonant with the finding of the U.S. Supreme Court in *Massachusetts v. Environmental Protection Agency* that "the harms associated with climate change are serious and well recognized." Drawing from a National Response Center report and a climate science expert, the Court described the significant harms associated with climate change:

> [A] number of environmental changes . . . have already inflicted significant harms, including "the global retreat of mountain glaciers, reduction in snow-cover extent, the earlier spring melting of ice on rivers and lakes, [and] the accelerated rate of rise of sea levels during the 20th century relative to the past few thousand years. . . ." "[Q]ualified scientific experts involved in climate change

that the lawsuit was "not about proving that climate change is happening or that human activity is driving it. For the purposes of this motion, those facts are undisputed." *Id*. at 1234. Rather, the court recognized that the questions before it were whether the U.S. government was responsible for some of the harms caused by climate change, and whether the youth plaintiffs had standing to challenge the government's policies in court. *Id*.

47. *Id*. at 1242 ("Lead plaintiff Kelsey Juliana alleges algae blooms harm the water she drinks, and low water levels caused by drought kill the wild salmon she eats. . . . Plaintiff Jacob Lebel alleges drought conditions required his family to install an irrigation system at their farm.").
48. *Id*. at 1243.
49. *Id*.
50. *Id*. at 1244. Because U.S. Court of Appeals for the Ninth Circuit is currently reviewing the district court's decision not to dismiss the case, the decision remains persuasive district court precedent.
51. *Id*. at 1268.
52. *Id*. at 1250.
53. *Id*. at 1261:

> [P]laintiffs' right of action to enforce the government's obligations as trustee arises from the Constitution. I agree with Judge Coffin that plaintiffs' public trust claims are properly categorized as substantive due process claims. As explained, the Due Process Clause's substantive component safeguards fundamental rights that are "implicit in the concept of ordered liberty" or "deeply rooted in this Nation's history and tradition," *McDonald*, 561 U.S. at 761, 767, 130 S. Ct. 3020 (internal citations, quotations, and emphasis omitted). Plaintiffs' public trust rights, related as they are to inherent aspects of sovereignty and the consent of the governed from which the United States' authority derives, satisfy both tests.

54. *Id*. at 1256:

> Defendants and intervenors contend that in the United States, the public trust doctrine applies only to the states and not to the federal government. This argument rests primarily on a passing statement in *PPL Montana, LLC v. Montana*, 565 U.S. 576, 132 S. Ct. 1215, 182 L. Ed. 2d 77 (2012). A close examination of that case reveals that it cannot fairly be read to foreclose application of the public trust doctrine to assets owned by the federal government.

55. For example, the contention in *Massachusetts v. Environmental Prot. Agency* that carbon could not be regulated as an air pollutant that endangers public health or welfare predates additional scientific evidence—such as IPCC, *Summary for Policymakers*, *in* Climate Change 2013: The Physical Science Basis, Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (T.F. Stocker et al. eds., Cambridge Univ. Press 2013), and U.S. Global Change Research Program, *supra* note 19—that arose after the 2007 decision:

> Petitioners are never able to trace their alleged injuries back through this complex web to the fractional amount of global emissions that might have been limited with [U.S. Environmental Protection Agency] standards. In light of the bit-part domestic new motor vehicle greenhouse gas emissions have played in what petitioners describe as a 150-year global phenomenon, and the myriad additional factors bearing on petitioners' alleged injury—the loss of Massachusetts coastal land—the connection is far too speculative to establish causation.

Massachusetts v. Environmental Prot. Agency, 549 U.S. 497, 544-45, 37 ELR 20075 (2007) (Roberts, J., dissenting).

> [T]he Court mistakenly believes this to be the end of the analysis. In order to be an "air pollutant" under the Act's definition, the "substance or matter [being] emitted into . . . the ambient air" must also meet the *first* half of the definition—namely, it must be an "air pollution agent or combination of such agents." The Court simply pretends this half of the definition does not exist.

Id. at 556 (Scalia, J., dissenting).

> research" have reached a "strong consensus" that global warming threatens (among other things) a precipitate rise in sea levels by the end of the century . . . "severe and irreversible changes to natural ecosystems," . . . a "significant reduction in water storage in winter snowpack in mountainous regions with direct and important economic consequences," . . . and an increase in the spread of disease. . . . [The expert] also observes that rising ocean temperatures may contribute to the ferocity of hurricanes.[56]

The ferocity of extreme weather events, the increase in drought, the diminution of clean water supplies for agriculture, contamination of water, and flooding—each of these carbon-emission-caused climate change threats to water resources has been met by judges applying the environmental rule of law. Hawaii is no exception. The public trust responsibility of the state of Hawaii with respect to water resources derives from Article XI, Sections 1 and 7 of the Hawaii State Constitution, and has been incorporated into the State Water Code.[57] The right of citizens to challenge the government's regulation of greenhouse gas emissions derives from the right to a clean and healthy environment in Article XI, Section 9[58] and Hawaii Revised Statutes Chapter 269, the statute prescribing the manner in which the public utilities commission must regulate fossil fuels.[59]

The 2-3 degree future for water resources caused by greenhouse gas emissions is one inconsistent with a clean and healthful environment in Hawaii. The public trust responsibility to preserve water resources for future generations counsels reduction of the rate of fossil fuel emissions. As the most isolated population center on earth, Hawaii's ecosystems are among the most vulnerable to global warming. In a 2-3 degree future, its water resources will likely be inadequate to serve the population. At present, water use has led to declining aquifer levels; to relieve demand on the aquifers, the state must find an additional 100 million gallons a day of freshwater.[60] Global warming of 2-3 degrees will jeopardize the ability of the forested watersheds to recharge aquifers.

The increase in extreme weather events will cause the devastation of the watersheds. By the end of the century, global warming will spawn 60% more storms that could cause potentially catastrophic damage to Hawaii.[61] Hawaii's state climatologist has noted that "historically we have maybe four [hurricanes a year] . . . last year [2015], we had 15. . . ."[62] Hurricanes in contact with Hawaii's steep mountain watersheds sustain wind speeds lethal to the trees that otherwise retain moisture and release water into the ground to recharge underground freshwater aquifers.

Aquifer recharge will also be diminished by declining rainfall:

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56. *Id.* at 521-22.
57. The Hawaii State Constitution provides: "For the benefit of present and future generations, the State . . . shall promote the development and utilization of these [water] resources in a manner consistent with their conservation and in furtherance of the self-sufficiency of the State." Haw. Const. art. XI, §1.

    The Hawaii State Constitution further provides:

    > The State has an obligation to protect, control and regulate the use of Hawaii's water resources for the benefit of its people.
    >
    > The legislature shall provide for a water resources agency which, as provided by law, shall set overall water conservation, quality and use policies; define beneficial and reasonable uses; protect ground and surface water resources, watersheds and natural stream environments; establish criteria for water use priorities while assuring appurtenant rights and existing correlative and riparian uses and establish procedures for regulating all uses of Hawaii's water resources.

    Haw. Const. art. XI, §7; *see also* In re Waiola O Molokai, Inc., 83 P.3d 664, 686 (Haw. 2004):

    > In *Waiāhole*, this court held that the public trust doctrine applied "to all water resources, unlimited by any surface-ground distinction." 94 Hawai'i at 133-35, 9 P.3d at 445-47 (affirming *Robinson*, 65 Haw. at 674, 658 P.2d at 310, wherein the court stated that "a public trust was imposed upon all the waters of the kingdom"). In so doing, this court traced the historical development of the public trust doctrine in Hawai'i and reasoned therefrom that article XI, sections 1 and 7 of the Hawai'i Constitution . . . adopted "the public trust doctrine as a fundamental principle of constitutional law in Hawai'i" and that the legislature, pursuant to the constitutional mandate of article XI, section 7, incorporated public trust principles into the Code. *Id.* at 130-32, 9 P.3d at 443-45. Moreover, in holding that the Code "does not supplant the protections of the public trust doctrine," this court recognized that "[e]ven with the enactment and any future development of the Code, the doctrine continues to inform the Code's interpretation, define its permissible 'outer limits,' and justify its existence." *Id.* at 133, 9 P.3d at 445.
58. Article XI, Section 9 was first declared self-executing in *County of Hawaii v. Ala Loop Homeowners*: "the right of enforcement described in the provision is self-executing." County of Hawaii v. Ala Loop Homeowners, 235 P.3d 1103, 1125 (Haw. 2010).
59. In re Application of Maui Elec. Co., Ltd., No. SCWC-15-0000640, 2017 WL 6390388, at *10, 47 ELR 20165 (Haw. Dec. 14, 2017):

    > [W]e next consider whether Chapter 269 is a law relating to environmental quality within the meaning of article XI, section 9. HRS §269-6 pertains to the general powers and duties of the Commission and prescribes that the Commission "shall consider the need to reduce the State's reliance on fossil fuels through energy efficiency and increased renewable energy generation." HRS §269-6(b) (Supp. 2013). This statutory provision also provides that in its decision-making, the Commission "shall explicitly consider" the effect of the State's reliance on fossil fuels on the level of "greenhouse gas emissions." *Id.* Indeed, dating back as far as 1977, when the legislature adopted HRS §269-27.2 concerning the utilization of electricity generated from nonfossil fuels, the legislature has repeatedly communicated its intent that the Commission is to reduce the State's dependence on fossil fuels and utilize renewable energy sources. This intent is manifest in the legislative history of Chapter 269, which unequivocally demonstrates an established State policy of prioritizing the utilization of renewable energy sources to reduce pollution in addition to securing the potential economic benefits and enhanced reliability of the State's energy supply.
60. Hawaii Community Foundation, A Blueprint for Action: Water Security for an Uncertain Future 13 (2016).
61. For example:

    > If the waters warm 4 or 5 degrees by the end of the century, there could be an alarming rise in tropical systems forming in the Central Pacific by the end of the century, specifically a 60 percent increase in storms that could cause potentially catastrophic damage to Hawai'i. . . . "If hurricanes are going to become more common, not just once a century, but once every 10 or 20 years, then maybe we should be thinking about changing the infrastructure, whether we should protect our power grid, whether we should have so many houses that are not well grounded."

    Melanie Yamaguchi, *"Wicked, Giant Problem": Is Hawaii Ready for Effects of Climate Change?*, Haw. News Now (Aug. 17, 2017), http://www.hawaiinewsnow.com/story/36025290/wicked-giant-problem-is-hawaii-ready-for-damaging-effects-of-climate-change (quoting Kevin Hamilton, University of Hawai'i atmospheric science researcher and former director of the International Pacific Research Center).
62. Vicki Viotti, *Pao-Shin Chu: Hawai'i's State Climatologist Sees From the Data That Certain Trends Have Been Affecting Our Weather, but He's Not One to Suggest Policy Prescriptions*, Honolulu Star-Advertiser, Aug. 5, 2016.

> On most islands, increased temperatures coupled with decreased rainfall and increased drought will reduce the amount of freshwater available for drinking and crop irrigation. Climate change impacts on freshwater resources in the region will also vary because of differing island size and topography, which affect water storage capability and susceptibility to coastal flooding. . . . Freshwater supplies are already constrained and will become more limited on many islands.[63]

Further, "saltwater intrusion associated with sea level rise will further reduce the quantity and quality of freshwater in coastal aquifers, especially on low islands."[64] Sea-level rise caused by global warming of 2-3 degrees will flood the city of Waikiki, destroying urban water systems and causing economic damage of two billion dollars a year in visitor spending.[65]

The specter of a Hawaii impacted by 2-3 degrees of global warming is before Hawaii's judiciary. As interpreters of the right to a clean and healthy environment and the public trust duties of government under the Hawaii State Constitution, Hawaii's judges are equipped to achieve just resolution of climate change claims by Hawaii citizens.

IV. Environmental Courts and the GJIE

The present framework of the environmental rule of law is inconsistent with carbon-induced heating of earth two or more degrees beyond pre-industrial levels. Nonetheless, the grave consequences of global warming of two degrees, deemed unacceptable by all the world's national governments (with the sole exception of the United States) are fast approaching.[66] One of the world's most acclaimed environmental jurists, Antonio Benjamin, Justice of the National High Court of Brazil, has described climate change "as the single most important legal issue facing judges globally."

Effective application of evolving environmental law and understanding of concomitant science is the gravamen of a world judiciary equipped to achieve just decisionmaking as global warming threatens the well-being of humanity. The compelling guide for policymakers published by UNEP on environmental courts and tribunals is a paean to the extraordinary capacity of environmental courts to prepare judges for the rigors of applying the environmental rule of law as society seeks to contend with global warming and climate change.[67] Two of the world's three largest carbon emitters, China and India, have developed extensive environmental court systems to supply judges with specialized knowledge of environmental law and related science. The country with the second largest carbon footprint, the United States, has only one environmental court with broad statewide criminal and civil jurisdiction encompassing regulation of land, air, and water—Hawaii's.[68] The handful of other environmental courts in the United States are of limited civil or municipal jurisdiction.[69]

Clearly, precedent is evolving rapidly as the world judiciary meets its constitutional, statutory, common-law, and civil code[70] duties to protect humanity within its jurisdiction from the devastation of a world warmed to 2+ degrees. Pivotal issues of causation, imminence of danger, sufficiency of evidence of damage, proper remediation, scale of injury, and valuation of costs of carbon emissions versus benefits of carbon emissions confront the judges who persevere to achieve a just application of the environmental rule of law to cases involving the most serious environmental crisis ever encountered. Environmental courts offer a veritable prescription for an arena of enlightened decisionmaking on such issues. This is so because the environmental court judge receives training in fast-evolving areas of relevant science and environmental law and thereafter remains as a decisionmaker to amass the insight and experience that accompanies just decisions on cases with complex technical/scientific issues.

Likewise, the GJIE[71] is a forum vital to strengthening the vanguard of judges who must decide the plight of those who resort to the courts for relief from global warming. Led by judges for judges, its mandate is to equip judges whose interest is the environment.[72] Regardless of jurisdic-

63. Jo-Ann Leong et al., *Hawai'i and U.S. Affiliated Pacific Islands*, *in* Climate Change Impacts in the United States: The Third National Climate Assessment 537, 542, 538 (J.M. Melillo et al. eds., U.S. Global Change Research Program 2014), *available at* https://nca2014.globalchange.gov/report/regions/hawaii-and-pacific-islands.
64. *Id.* at 538.
65. *See* Charles H. Fletcher, U.S. Geological Survey, National Assessment of Shoreline Change: Historical Shoreline Change in the Hawaiian Islands (2012) (Open-File Report 2011-1051); Nathan Eagle, *Save Beaches or Property? Climate Change Will Force Tough Choices*, Honolulu Civ. Beat, July 28, 2017, http://www.civilbeat.org/2017/07/save-beaches-or-property-climate-change-will-force-tough-choices/.
66. By some estimates, at the present rate of carbon emission, global temperatures are predicted to rise by up to four degrees Celsius by 2100. Damian Carrington, *Planet Likely to Warm by 4C by 2100, Scientists Warn*, Guardian (Dec. 31, 2013), https://www.theguardian.com/environment/2013/dec/31/planet-will-warm-4c-2100-climate.
67. UNEP, Environmental Courts & Tribunals: A Guide for Policy Makers (2016), *available at* https://wedocs.unep.org/bitstream/handle/20.500.11822/10001/environmental-courts-tribunals.pdf?sequence=1&isAllowed=y.
68. Haw. Rev. Stat. §§604A-1 to 604A-3 (2016).
69. The state of Vermont established the nation's first environmental court in 1990, but it does not have criminal jurisdiction. *Compare* Vt. Stat. Ann. tit. 4, §§1001-1004, *with* Haw. Rev. Stat. §§604A-1 to 604A-3.
70. For example, the Constitutional Court of Colombia recognized the critical role of wetlands in water security and climate change mitigation with Law No. 1450 of 2011, Colombian National Development Plan (Decision C-035/16). *See* Organization of American States, Climate Change: A Comparative Overview of the Rights Based Approach in the Americas 64-65 (2016), *available at* http://www.oas.org/en/sedi/dsd/docs/climate_change.pdf.
71. The GJIE was formally established at the International Union for the Conservation of Nature (IUCN) World Environmental Law Congress in Rio de Janeiro on April 29, 2016. Thereafter, it was approved by the IUCN World Congress in Honolulu in September 2016.
72. The Charter for the GJIE outlines two categories of judicial members: institutional and individual. Individual membership is open to the following:
    > (1) Individuals currently serving as judges or in a capacity as judicial decision-makers on specialized environmental courts or tribunals; or
    >
    > (2) Individuals currently serving as judges or in a capacity as judicial decision-makers on other courts or tribunals, with an expressed interest or expertise in environmental matters.

    Charter of the Global Judicial Institute for the Environment, Apr. 29, 2016, at 3-4, http://iucnael2016.no/wp-content/uploads/2016/06/Charter-of-the-Global-Judicial-Institute-Rio-de-Janeiro-29-April-2016-v2.pdf.

tion or court assignment, judges who wish to build capacity for decisions involving the environment are eligible for membership.[73] The mission of the GJIE is to "support the role of courts and tribunals in applying and enforcing environmental laws and in promoting the environmental rule of law and the fair distribution of environmental benefits and burdens."[74]

To fulfill its mission, the GJIE has established specific objectives, including to:

> a. Provide research, analysis, and publications on environmental adjudication, environmental dispute resolution, court practices and procedures, court administration, legal claims and actions, judicial remedies, and environmental justice, including access to environmental information, public participation in environmental decision-making, and access to justice;
>
> b. Strengthen the capacity of judges in administration and resolution of cases and disputes related to the environment;
>
> c. Provide a forum for convening international, regional, national, and subnational judges, court officials, and judicial institutions, to create partnerships for collaboration and information exchange on environmental law issues[.][75]

Any judge tasked with applying the environmental rule of law will have the GJIE as a resource. It will be a repository for decisions of judicial colleagues who are decisionmakers on the front line of global warming litigation. It will be a collaborative center to facilitate global communication between judges and to support those whose independence may be threatened in response to the just application of the environmental rule of law.

V. Conclusion

Environmental law principles applicable to the impacts of climate change upon the water resources of future generations stand against the present rate of anthropogenic warming of earth. Guided by the environmental rule of law, the world judiciary is responding to humanity's struggle to limit global warming to well below two degrees above pre-industrial levels, as per the Paris Agreement, and in so doing avoid catastrophic consequences for the human race and the greater community of life with whom we share earth as home. Within the parameters of the environmental rule of law, judges strive to protect earth's water resources and its people from the impending consequences of ongoing human-induced carbon emitted at the present rate. Their decisions must be based on command of rapidly developing science and complete understanding of accelerating change in judicial precedent.

The endeavor to reach a solution that avoids two degrees of warming is time-limited to no more than the year 2100, at present levels of emission. The men and women who are tasked as judges with the duty to decide the manner in which the environmental rule of law is applied to the most important social issue yet facing humanity will be greatly empowered by the instruction, support, and collaboration of environmental courts and the GJIE.

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73. Institutional membership in the GJIE includes the following:
> Institutional Membership is open to any international, regional, national, and subnational courts and tribunals, and to judicial institutions, such as judicial institutes, schools, associations, academies, and other similar organizations that are directed by judges and are composed of or provide services to judges and judiciaries. The Institute particularly encourages the participation of courts, tribunals, and institutions of judges that include within their jurisdiction the consideration of environmental, land use, or natural resources issues.

Id. at 3.

74. *Id.* at 2.

75. *Id.*