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American Indians, Climate Change, and Ethics for a Warming World

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AMERICAN INDIANS, CLIMATE CHANGE, AND ETHICS FOR A WARMING WORLD

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Developing a sense of ourselves that would properly balance history and nature and space and time is a more difficult task than we would suspect and involves a radical reevaluation of the way we look at the world around us. Do we continue to exploit the earth or do we preserve it and preserve life? Whether we are prepared to embark on a painful intellectual journey to discover the parameters of reconciling history and nature is the question of this generation.[1]

INTRODUCTION

American Indian tribes and people have contributed very little to the causes of global warming, yet for geographic, cultural, and demographic reasons, they stand to suffer disproportionately from global warming's negative effects. A recent study, *Native Communities and Climate Change*, prepared by the Natural Resources Law Center at the University of Colorado Law School, documents that these effects include, among others, threats to traditional hunting and gathering, destruction of tribal villages in Alaska, increased pressure on tribal reserved rights to water in the arid Southwest, and inundation of reservation lands in Florida.[2] The disproportion between tribal contributions to global warming and the negative impacts on tribes qualifies this as an environmental justice issue.[3] As the *Native Communities and Climate Change* Report suggests, a complex of legal rights, in conjunction with Congress's moral obligation

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1. VINE DELORIA, JR., GOD IS RED: A NATIVE VIEW OF RELIGION 61 (2d ed. 1992).

2. JONATHAN HANNA, NATIVE COMMUNITIES AND CLIMATE CHANGE: PROTECTING TRIBAL RESOURCES AS PART OF NATIONAL CLIMATE POLICY 11-12, 19, 26 (Natural Res. Law Ctr., Univ. of Colo. Law Sch., 2007), http://www.colorado.edu/law/centers/nrlc/publications/ClimateChange Report-FINAL%20_9.16.07_.pdf.

3. *See* David H. Getches & David N. Pellow, *Beyond "Traditional" Environmental Justice*, *in* JUSTICE AND NATURAL RESOURCES: CONCEPTS, STRATEGIES, AND APPLICATIONS 25-26 (Kathryn M. Mutz et al. eds., 2002) (providing a definition of environmental justice in the natural resources context); *see also* Exec. Order No. 12,898, 59 Fed. Reg. 7629 (Feb. 11, 1994) (calling on federal agencies to achieve environmental justice as part of their mission and defining the problem as the "disproportionately high and adverse human health or environmental effects" of programs or policies).

to tribes, provides the foundation and incentive for the federal government to take action to address these impacts.[4]

Yet as important as it is to highlight its environmental justice aspects, global warming's spatial and temporal dispersions render it a global and intergenerational collective action problem that is not susceptible to typical environmental justice solutions. Global warming is caused by human emissions of carbon dioxide (CO_2) and other gases (methane, nitrous oxide, various hydrofluorocarbons, various perfluorocarbons, and sulfur hexafluoride) that trap heat that would otherwise be reflected back into the atmosphere.[5] The atmosphere is a global commons; no matter where in the world you are, your emissions contribute to its increasing insulating properties. Further, the atmosphere cannot be compartmentalized. For example, the fact that the United States has the highest historical greenhouse gas emissions[6] does not mean that our atmosphere is "thicker" and that we will suffer from global warming proportionately more than other countries. The spatial dispersion also means that reductions in one part of the globe can be rendered meaningless by increases in another part of the globe. If the total parts per million of CO_2 continue to rise overall, it does not matter where the parts come from. This spatial dispersion feature of global warming means that disparate effects from climate change cannot be redressed by targeting the emitters closest to the affected area. Furthermore, disparate effects cannot even be redressed by targeting only the biggest emitters. The commons aspects of climate change require all emitters to be part of a collective solution. These spatial collective action features are what prompt politicians to adopt the line: "Why should we reduce our emissions if China will soon render our efforts meaningless?"[7] While there are many appropriate rejoinders to this, including the imperative of moral leadership and the necessity of the United States leading the way in terms of technological solutions, the do-nothing position has, to date, prevailed as a matter of national policy.

Climate change's temporal dispersion adds an even more challenging aspect to the commons problem. Global warming is a severely temporally lagged phenomenon. CO_2, the most prevalent of the greenhouse gases, stays in the atmosphere for hundreds of years,[8] so most of the molecules added since the dawn of industrialization are still hanging around. As a practical matter, every molecule we add is one that is in-

4. HANNA, *supra* note 2, at 28-29.

5. Timeforchange.org, Cause and Effect for Global Warming, http://timeforchange.org/cause-and-effect-for-global-warming (last visited Mar. 27, 2008).

6. *See* Robert Collier, *A Warming World: China About to Pass U.S. as World's Top Generator of Greenhouse Gases*, S.F. CHRON., Mar. 5, 2007, at A1.

7. *See* LEE LANE & SAMUEL THERNSTROM, A NEW DIRECTION FOR U.S. CLIMATE POLICY: CREDIBLE ALTERNATIVES TO KYOTO 2 (2007), *available at* http://www.aei.org/docLib/20070201_EPOPosted_g.pdf (discussing the challenge of unifying politicians around effective climate policies).

8. Timeforchange.org, *supra* note 5.

creasing the thickness of our atmospheric blanket, because none are going away within a time frame that matters. This results in a lag between emissions increases and the effects on warming. The effects from today's blanket will be felt throughout the rest of the century (meaning increased warming and so on), even if we were to stop all carbon emissions today. Likewise, we are now feeling the effects not only of our own emissions, but of our parents' and grandparents.' Climate change is therefore an intergenerational collective action problem of potentially tragic proportions.[9] Each generation has incentive not to act, since the effects will be felt later. Yet only the current generation has the ability to take steps to avoid compounding the misery inflicted on future generations.[10]

Global warming's spatial and temporal dispersions render it a profound global and intergenerational collective action problem. Addressing the disparate effects warming will have on tribes and other disadvantaged communities leads us into these potentially tragic features of climate change, and requires us to articulate an ethical framework that would support global efforts to mitigate (i.e., reduce and eventually eliminate) human contributions to global warming, as well as to assist tribal communities in the already inevitable need to adapt to a warming world. Ultimately, solutions, if they are to take seriously environmental justice claims as well as the impacts at large, lie in the realm of sustainability. While that term has been overused, what I mean by it is the adoption of policies and practices that allow us to live within our ecological means and to distribute the benefits of development equally across human communities.[11] To provide redress as well as hope to the most disadvantaged communities, we should adopt policies and practices of sustainability worldwide. This brings us to the significant problem that, despite decades of discussion about sustainability and what it means, we have done relatively little to implement or achieve it. There are at least several explanations for this, each rooted in various understandings of human nature and the actual extent of resource scarcity.[12] Why, then, should anyone bother to try? The answer lies, I think, in the

9. *See generally* Stephen Gardiner, *A Perfect Moral Storm: Climate Change, Intergenerational Ethics and the Problem of Moral Corruption*, 15 ENVTL. VALUES 397 (2006).

10. *See id.*

11. *See* WORLD COMM'N ON ENV'T AND DEV., OUR COMMON FUTURE 4, 8-9 (1987) [hereinafter OUR COMMON FUTURE]. The report, edited by Gro Harlem Brundtland and therefore known as the Brundtland Report, provides a definition of sustainable development and outlines the principles and practices that would operationalize it on a global scale.

12. Some argue that most humans are not inclined to give up present benefits for the good of future generations. *See, e.g.*, Cass R. Sunstein, *On the Divergent American Reactions to Terrorism and Climate Change*, 107 COLUM. L. REV. 503, 503 (2007) (arguing that this accounts for why most Americans have not pressed for climate change policies). Others contend that the costs of taking action are too high and that we should invest in technological fixes to engineer our way out of environmental problems, including climate change. *See, e.g.*, Thomas Schelling, *Climate Change: The Uncertainties, the Certainties, and What They Imply About Action*, 4 ECONOMISTS' VOICE 3, 2-4 (2007), *available at* http://www.bepress.com/cgi/viewcontent.cgi?article=1276&context=ev.

kinds of lives we want to lead, the norms we want to aspire to, and the virtues we want to cultivate, irrespective of whether we will ever have any certainty that either the specific injustices suffered by American Indians or the broader effects that everyone will endure as a result of climate change will be redressed or avoided. Not coincidentally, a philosophical worldview that we might turn to for instruction as we navigate this new terrain is that embraced by many American Indian tribes.

This article will proceed by describing in Part I the place-based worldview held by most American Indian tribes. An understanding of this worldview, and the cultural and ethical practices that flow from it, is necessary to comprehend the disparate negative effects tribes will suffer from global warming. Yet, fittingly, the American Indian worldview may also provide the blueprint for life in a zero-emissions world. In Part II, I will summarize the particular effects on tribes in the four regions examined in the *Native Communities and Climate Change* Report, and also discuss the rights tribes possess that give rise to legal as well as moral claims for specific redress. In Part III, I will discuss the inevitability of a global approach to this particular form of environmental injustice, highlighting the possibilities for deepening our conception of sustainability and giving it ethical content that may be crucial to navigate the warming world we all face.

I. AMERICAN INDIAN CULTURE AND RELIGION: SPACE AND PLACE AND ALL THAT COMES FROM IT

Most modern American Indian nations do not have pristine landscapes. On a trip through Indian country, the following sights are not uncommon: trash swirling in parking lots; garbage piling up in washes; road-killed dogs lying bloating in the sun for days. Like all poverty-stricken places in the modern world, most Indian nations have trouble keeping the refuse of consumer life at bay. It is important to start on this note, because in describing the deep, vital, and complex environmental ethic that many tribes hold, I do not want to invoke the mythic, romantic Indian, perpetually at one with nature and free of taint and pollution. First, like all human communities, American Indians do not always act in perfect sync with their deeply held norms and beliefs. Second, the hardships of economic and cultural devastation visited on tribes throughout history have left them with a lot of garbage to clean up, figuratively and literally. Yet, remarkably, this history has not snuffed out traditional American Indian culture and religion, which carries on to this day. Part of Native tradition is to embrace their landscapes, whether battered or pristine. In short, American Indian people are not hard-wired to be any closer to nature or more environmentally sensitive than non-Indian people. But their traditional religious and cultural systems of meaning revolve around the earth and its values, and these long-held beliefs have influenced how American Indians view and interact with the land and the natural world.

In his book, *God Is Red: A Native View of Religion*, Vine Deloria, Jr., describes the philosophical and thematic differences between American Indian religions and western, Judeo-Christian religions.[13] One crucial difference is that of organizing principles: American Indian religions emphasize space while the Judeo-Christian religions emphasize time.[14] As Deloria explains, Judeo-Christian religions place great emphasis on the chronology of their story of revelation.[15] It is important, for example, that the savior appeared when he did, and that the spiritual message, good for the rest of time, was then revealed.[16] While particular places can take on sacred significance, such as the town of Bethlehem or the site of the crucifixion, they do so typically because of the historical events that took place there.[17] For American Indians, the place itself is sacred, and therefore the starting point for the system of beliefs and ethics that generate from it: "American Indians hold their lands—places—as having the highest possible meaning, and all their statements are made with this reference point in mind."[18]

This spatial aspect to American Indian religion gives different content to revelation. The place reveals its meaning, through communion and ceremony, to religious practitioners on an ongoing basis. The content of that revelation may vary, as different behaviors may be necessary to behave rightly toward a place depending on the season, year, or era. As Deloria writes:

> The structure of [American Indian] religious traditions is taken directly from the world around them, from their relationships with other forms of life. Context is therefore all-important for both practice and the understanding of reality. The places where revelations were experienced were remembered and set aside as locations where, through rituals and ceremonials, the people could once again communicate with the spirits. Thousands of years of occupancy on their lands taught tribal peoples the sacred landscapes for which they were responsible and gradually the structure of ceremonial value became clear. *It was not what people believed to be true that was important but what they experienced as true. Hence revelation was seen as a continuous process of adjustment to the natural surroundings and not as a specific message valid for all times and places.*[19]

Christian revelation, by contrast, issues at a specific time to a specific listener, and is literally "the gospel" until a chronologically subsequent

13. *See generally* DELORIA, *supra* note 1.
14. *Id.* at 122.
15. *Id.* at 98.
16. *See id.* at 104.
17. *See id.* at 67.
18. *Id.* at 62.
19. *Id.* at 66-67 (emphasis added).

amendment.[20] (Some branches of western religions do not adhere to the possibility of modern amendment by revelation, while others do.[21])

Because most American Indian religions have this place-centric aspect, there is a corresponding totality to the role that religion has in Indian life. A place generates not just a list of rules to follow, but a whole life's worth of attitudes and behaviors: "Tribal religions are actually complexes of attitudes, beliefs, and practices, fine-tuned to harmonize with the lands on which the people live."[22] As Deloria implies, there is even something misleading about calling traditional American Indian beliefs and practices "religion," because it implies segregation from the rest of life.[23]

The place-based nature of American Indian religion and culture has come to legal and public consciousness as a result of conflicts over sacred sites on public lands. For example, in *Lyng v. Northwest Cemetery Protective Association*, the Yurok, Karok, and Tolowa Indians fought the construction of a Forest Service road that had been proposed to run through an area of the Six Rivers National Forest in Northern California.[24] The area, known as Chimney Rock,

> "is significant as an integral and indispensible part of Indian religious conceptualization and practice." Specific sites are used for certain rituals, and "successful use of the [area] is dependent upon and facilitated by certain qualities of the physical environment, the most important of which are privacy, silence, and an undisturbed natural setting."[25]

In dissent, Justice Brennan described the tribes' relationship to the Chimney Rock area as follows:

> For respondent Indians, the most sacred of lands is the high country where, they believe, prehuman spirits moved with the coming of humans to the Earth. Because these spirits are seen as the source of religious power, or "medicine," many of the tribes' rituals and practices require frequent journeys to the area. Thus, for example, religious leaders preparing for the complex of ceremonies that underlie the Tribes' World Renewal efforts must travel to specific sites in the high country in order to attain the medicine necessary for successful renewal. Similarly, individual tribe members may seek curative powers for the healing of the sick, or personal medicine for particular

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20. *See id.* at 66.

21. *See, e.g., All Things Considered: Explaining the Underpinnings of Mormonism* (NPR radio broadcast July 5, 2007) (transcript *available at* http://www.npr.org/templates/story/story.php?storyId=11761615).

22. DELORIA, *supra* note 1, at 70.

23. *See id.*

24. Lyng v. Nw. Cemetery Protective Ass'n, 485 U.S. 439, 442 (1988). The Court is quoting from a study commissioned by the Forest Service completed in 1979. *Id.* at 442.

25. *Id.* (second alteration in original) (citations omitted).

> purposes such as good luck in singing, hunting, or love. A period of preparation generally precedes such visits, and individuals must select trails in the sacred area according to the medicine they seek and their abilities, gradually moving to increasingly more powerful sites, which are typically located at higher altitudes. Among the most powerful of sites are Chimney Rock, Doctor Rock, and Peak 8, all of which are elevated rock outcroppings.[26]

Other sacred areas that are well known due to conflicts over public lands include: Devil's Tower in Wyoming, a stark volcanic feature that is central to the religious and cultural lives of several plains tribes and also a popular rock climbing destination;[27] Cave Rock, a once-popular climbing spot that is now off-limits due in part to the religious concerns of the Washoe Tribe;[28] and Rainbow Bridge, an enormous sandstone arch that can be visited by boaters coming from Lake Powell, but which is also considered central to the ceremonies of Navajo people in the region.[29] This list is just a partial one, omitting not only many other sacred sites that have become publicly identified through land use conflicts, but also the vast number that tribes and their members keep to themselves.

Another feature of most American Indian religions is that humans are part of an animate universe and have moral relationships with all other creatures, beings, and even elements.[30] For example, the Hopi hold several springs to be sacred.[31] The springs play an integral role in the Hopi creation story and are part of ongoing ceremonies and practices.[32] Likewise, animals are sacred to many tribes and are required for the proper performance of religious ceremonies.[33] For the Northern Arapaho, Hopi, Navajo, and other plains and southwest tribes, the eagle plays a key role.[34] For each of these tribes, an entire set of practices surrounding capture, treatment, and use of the bird comprise the religious experience.[35] As this small handful of examples indicates, religious and cul-

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26. *Id.* at 461 (Brennan, J., dissenting).

27. *See* Bear Lodge Multiple Use Ass'n v. Babbit, 2 F. Supp. 2d 1448 (D. Wyo. 1998), *aff'd*, 175 F.3d 814 (10th Cir. 1999).

28. *See* Access Fund v. U.S. Dep't of Agric., 499 F.3d 1036 (9th Cir. 2007).

29. *See* Natural Arch & Bridge Soc'y v. Alston, 209 F. Supp. 2d 1207 (D. Utah 2002); Badoni v. Higginson, 455 F. Supp. 641 (D. Utah 1977).

30. *See* Rebecca Tsosie, *Tribal Environmental Policy in an Era of Self-Determination: The Role of Ethics, Economics, and Traditional Ecological Knowledge*, 21 VT. L. REV. 225, 273, 276 (1996).

31. *See* Peter Whiteley & Vernon Masayesva, *The Use and Abuse of Aquifers: Can the Hopi Indians Survive Multinational Mining?*, *in* WATER, CULTURE & POWER 13-18 (John M. Donahue & Barbara Rose Johnson eds., 1998).

32. *See* Katosha Belvin Nakai, *Water: It Always Has Been; It Is; It Will Be—A Cultural Perspective on the Valuation of Water*, 38 TEX. TECH L. REV. 1027, 1032-33 (2006).

33. DELORIA, *supra* note 1, at 89.

34. *See* Victoria Sutton, *Wind and Wisdom*, 1 ENVTL. & ENERGY L. & POL'Y J. 345, 360 (2007).

35. *See* United States v. Friday, No. 05-CR-260-D, 2006 WL 3592952, at *1 (D. Wyo. Oct. 13, 2006) (describing the religious significance of the eagle to the Northern Arapaho); United States

tural life for American Indians is inextricably bound up with a way of living in a particular place with and among its creatures and elements. Thus, despite the variety within and among American Indian tribes, Vine Deloria identified the following common features of the American Indian religious outlook:

> The Indian is confronted with a bountiful earth in which all things and experiences have a role to play. The task of the tribal religion, if such a religion can be said to have a task, is to determine the proper relationship that the people of the tribe must have with other living things and to develop the self-discipline within the tribal community so that man acts harmoniously with other creatures. The world that he experiences is dominated by the presence of power, the manifestation of life energies, the whole life-flow of a creation. Recognition that the human beings holds [sic] an important place in such a creation is tempered by the thought that they are dependent on everything in creation for their existence.[36]

This attachment to place, rooted in religious and cultural norms and traditions, is integral to the disparate effects tribes are experiencing due to global warming. It is not simply that places to which strong religious feelings are attached are at risk. Ways of life that have evolved specifically around these places are also at risk. The option of relocating is certainly as available to tribal communities as to others, but relocation has a different meaning if the cultural definition of a people is bound to a location and its unique ecological offerings. Certainly, this resonates with issues faced by other affected communities. The people who came home to New Orleans, and the people who never left, describe their attachment to a way of life, not just a spot on the map.[37] The point is not to say that the norms and practices of Native communities are like no others. But, there is a key distinction to keep in mind. For Native communities, it is not just the place that matters, but the animate world of which it is a part: the animals, plants, seasons, and rhythms that flow from centuries of knowledge about a place and all of its emanations.[38] Global warming is already affecting all of these aspects of place, and will continue to do so for some time to come.

II. EFFECTS ON NATIVE COMMUNITIES FROM GLOBAL WARMING

Scientific knowledge about the phenomenon of climate change has been accumulating for at least two decades, and reports by international bodies and others have become increasingly certain about the causes as

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v. Tawahongva, 456 F. Supp. 2d 1120, 1124 n.8 (D. Ariz. 2006) (describing the religious significance of the eagle to the Hopi).

36. DELORIA, *supra* note 1, at 88.

37. *See, e.g.*, Mike Miller, *Morning Edition: My Home Is New Orleans* (NPR radio broadcast Aug. 28, 2006) (transcript *available at* http://www.npr.org/templates/story/story.php?storyId=5705026).

38. *See* Tsosie, *supra* note 30, at 276-80.

well as the need for immediate policy responses. The Intergovernmental Panel on Climate Change (IPCC) issued its fourth set of assessment reports in 2007, and its conclusions were stark.[39] The reports, which reflect the consensus of hundreds of participating scientists who have reviewed thousands of studies on climate, concluded that "warming of the climate system is unequivocal," and further expressed "very high confidence" that human emissions of CO_2 and other heat-trapping gases since 1750 have caused the earth's surface temperature to rise.[40] During that time, CO_2—the most important of the anthropogenic greenhouse gases—increased from a pre-industrial level of roughly 280 parts per million (ppm) to 379 ppm in 2005.[41]

Unfortunately, the moment has long passed when we could think exclusively about mitigation strategies, as they are called in climate change parlance. Mitigation strategies are those aimed at reducing and eventually zeroing out global greenhouse gas emissions in order to slow, stop, and perhaps ultimately even reverse the warming trend. Scientists estimate that beyond 455 ppm of CO_2, the effects from warming will be extreme, unpredictable, and even catastrophic.[42] The pressing need to engage in serious, globally coordinated action to mitigate emissions still exists, and will continue to exist indefinitely, because even if we surpass 455 ppm, we will need to stabilize and eliminate emissions, or the climate system will be an ever-moving, increasingly volatile target, rendering adaptation measures temporary at best, futile at worst. But, as the IPCC reports indicate, the effects of warming are already being experienced and, even under the most optimistic mitigation scenarios, will continue for the foreseeable future.[43] Governments around the world are therefore already engaging in adaptation planning, which means fashioning reactions to the extant and inevitable effects of warming. These ef-

39. *See* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS (Susan Solomon et al. eds., Cambridge Univ. Press 2007) [hereinafter IPCC: THE PHYSICAL SCIENCE BASIS]; INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: IMPACTS, ADAPTATION AND VULNERABILITY (Martin Parry et al. eds., Cambridge Univ. Press 2007) [hereinafter IPCC: IMPACTS, ADAPTATION AND VULNERABILITY].

40. IPCC: THE PHYSICAL SCIENCE BASIS, *supra* note 39, at 3, 5.

41. *Id.* at 2.

42. *See* Dan Shapley, *Global Warming "Beyond the Worst-Case Scenario,"* THE DAILY GREEN.COM, Oct. 9, 2007, http://www.thedailygreen.com/environmental-news/latest/7642; *see also* Jim Hansen, *The Threat to the Planet*, 53 THE NEW YORK REVIEW OF BOOKS 12 (2006), *available at* http://www.nybooks.com/articles/19131. Hansen states that the business-as-usual scenario, with an annual global increase in emissions of two percent such as has occurred in the last 10 years, will make it impractical to achieve the reductions necessary to stabilize temperature increases at less than two degrees Fahrenheit. *Id.* At temperature increases above this, feedback effects, including the release of methane from permafrost, could result in much more accelerated warming. *Id.* In addition, the business as usual scenario would cause the disintegration of the land-based ice sheets, ultimately resulting in an 80-foot rise in sea levels. *Id.* Others put the critical stabilization point at 500 ppm for CO_2. *See, e.g.*, Martin Hoffert, Physics Dept., N.Y. Univ., Presentation at the Natural Resources Law Ctr., Univ. of Colorado: An Energy Revolution for the 21st Century (June 8, 2006), *available at* http://www.colorado.edu/law/centers/nrlc/summerconference/2006/Hoffert.zip (copy also on file with author).

43. IPCC: THE PHYSICAL SCIENCE BASIS, *supra* note 39, at 12.

fects include rising sea levels (with predictions ranging from a few to twenty or more feet), acidification of oceans with harm to coral reefs and other species, increasing intensity and frequency of extreme weather events (such as tropical storms and heat waves), larger drought affected areas and more frequent droughts and floods, and changing patterns for pests and diseases of various sorts.[44] This is a list of likely global effects, and each region will experience different consequences. The *Native Communities and Climate Change* Report drew from various regional studies of current and future effects in order to draw some conclusions about impacts on American Indian tribes in those areas.[45]

A. Pacific Northwest: Effects on Salmon

For American Indian Tribes of the Pacific Northwest, the potential demise of wild salmon is the signature effect of climate change. Salmon are central to the religious, cultural, and economic lives of most tribes in the region, and as a result tribes negotiated treaty rights, enforceable to this day, to continue to harvest the fish.[46] While threats to wild salmon are multiple, the changing climate could be the factor that pushes the species beyond the brink. For these reasons, salmon are an appropriate lens through which to view the impacts to Northwest tribes from climate change.

1. Changing Climate in the Pacific Northwest

The Pacific Northwest has experienced a region-wide warming trend over the last 100 years.[47] Average temperatures have risen by 1.5 degrees Fahrenheit, with the 1990s being the warmest decade.[48] Average temperatures in the Puget Sound region rose at a higher rate, with a 2.3 degree Fahrenheit increase in the twentieth century, and much of that warming occurring within the last 50 years.[49] Projections for the future indicate that the warming trend will accelerate.[50] Climate models predict that average temperatures for the region will rise at the rate of 0.5 degrees Fahrenheit per decade at least through the middle of the twenty-first century, with greater increases between June and August but higher average temperatures occurring year round as well.[51]

Precipitation changes have also occurred in the region. The Pacific Northwest experienced an 11 percent average increase in annual precipitation in the twentieth century.[52] Yearly levels fluctuated significantly,

44. IPCC: IMPACTS, ADAPTATION AND VULNERABILITY, *supra* note 39, at 11-12, 14, 18.
45. *See* HANNA, *supra* note 2, at 5.
46. *Id.*
47. *Id.*
48. *Id.*
49. *Id.*
50. *Id.*
51. *Id.*
52. *Id.*

however, and the past trend is not as easy to discern as it is for the temperature record.[53] Future predictions about precipitation amounts are also less definitive, though most climate models show only little or slight change in the annual mean precipitation through the first half of the twenty-first century.[54] The more significant effect is on the hydrologic cycle. While roughly the same amount of precipitation appears likely to fall in the region, more of it will fall as rain rather than snow, and the spring runoff will occur earlier.[55] With warmer temperatures occurring all year and particularly in the summer, stream flows will be higher in the winter and lower in the spring and summer.[56] These changes in turn are likely to cause more flooding in the winter and more drought risk in the summer, when water is in greater demand.[57]

Climate change has also already resulted in changes to the marine and fresh water environment in the region. Rising sea levels are causing shore erosion, landslides, damage to coastal estuarine and salt marsh habitats, and destruction of near-shore marine plants including eelgrass and bull kelp.[58] In addition, climactic factors will change the circulation and upwelling patterns in the Puget Sound area, where freshwater inland streams mix with saltwater from the Pacific Ocean to create a unique marine environment on which aquatic species depend.[59] Changes in freshwater flow and timing, described above, will affect the circulation and stratification of these coastal waters.[60] In addition, warmer air temperatures will result in warmer freshwater and ocean temperatures.[61] Temperature increase, along with the increased volume of freshwater into the marine environment, will further affect ocean salinity.[62] Both the changing temperatures and salinity will in turn affect oxygenation levels and phytoplankton growth.[63] High levels of winter precipitation are also the likely cause of higher levels of fecal coliform in Puget Sound.[64] Finally, glacial melt will affect volume and temperatures of stream flows, and may also increase stream contamination when pollutants stored in the ice are released by melting.[65]

53. *Id.*
54. *Id.* at 5-6.
55. *Id.* at 6.
56. *Id.*
57. *Id.*
58. *Id.*
59. *Id.*
60. *Id.*
61. *Id.*
62. *Id.*
63. *Id.*
64. *Id.*
65. *Id.*

2. Effects on Salmon and Tribes

Salmon will be affected by each of the above described effects of climate change in the Pacific Northwest. As anadromous fish, salmon hatch in freshwater, migrate to the ocean to mature, and then make their way back to the freshwaters of their birthplace to spawn.[66] Because they move through various aquatic environments in the course of their lifecycle, the effects climate change will have on each of these environments will in turn affect the salmon. First, increases in freshwater temperatures pose risk to the salmon. Higher stream temperatures will affect the success and timing of egg incubation.[67] For those salmon fry that do hatch, a further risk is that stream temperatures may eventually become too high to support the young fish.[68] Rising stream and marine temperatures could also diminish the salmon food supply.[69] If ocean temperatures rise dramatically, entire salmon populations might be forced to abandon historic migration patterns and habitat ranges, seeking colder waters to the north.[70] This phenomenon may have already begun. Coho salmon, for example, have been found one thousand miles further north than their traditional habitat.[71] Similarly, other species may move into salmon habitat in search of cooler waters, creating greater risk of predation and competition for food.[72]

Changes in the hydrologic cycle will also affect the salmon. More winter precipitation and higher winter stream flows will increase the frequency and severity of flooding, scouring streambeds and potentially destroying the gravel habitat necessary for salmon spawning.[73] Flooding will increase the number of landslides, causing siltification of stream beds which could smother salmon eggs.[74] Higher and earlier winter stream flows may also push the young salmon along their ocean-ward journey earlier than usual, forcing them into the saltwater environment before food supplies are available.[75] Finally, the lower summer flows will make it more difficult for salmon to migrate and increase already tight competition both for habitat and food sources.[76]

Certainly, climate change does not pose the first or only threat to salmon survival. Many salmon species are already on the brink of extinction due to logging, dams, over-fishing, and the range of other effects on water quality and quantity that have been visited on the region during

66. *Id.* at 7.
67. *Id.*
68. *Id.*
69. *Id.*
70. *Id.*
71. *Id.*
72. *Id.*
73. *Id.*
74. *Id.*
75. *Id.*
76. *Id.*

the last 200 years.[77] Yet climate change could be the over-riding factor that renders all of the other restoration efforts futile. Fish ladders, stream-bed restoration, and restrictions on over-fishing could all be for naught if the changes described above cause the species to abandon the region entirely. For the American Indian tribes of the Pacific Northwest, this would be a cultural and economic disaster. For thousands of years, salmon have provided the basis of a way of life for these tribes.[78] Historically, salmon poured out of the Northwest streams in numbers that today defy imagination. In the Columbia River basin alone, it is estimated that 16 million salmon and steelhead were produced annually.[79] The salmon's regular migratory patterns allowed the tribes to rely on them as a year-round food source, and tribal fishing and storage techniques created the basis for extensive trade networks.[80] The salmon's centrality to tribal life is reflected in tribal custom, artwork, legend, and ceremonial life.[81]

The salmon's significance to American Indian tribes of the region is also reflected in the treaties that the tribes entered into, ceding vast tracts of their aboriginal homelands but carefully retaining the right to fish.[82] From 1854 to 1855, Isaac Stevens, governor of the Washington Territory, negotiated treaties with tribes throughout what are now Washington, Oregon, and Idaho.[83] In recognition of the centrality of salmon to these otherwise diverse Indian nations, Governor Stevens included virtually identical language reserving the tribes' right to fish into each treaty.[84] The following language from the Treaty with the Tribes of Middle Oregon is representative:

> [T]he exclusive right of taking fish in the streams running through and bordering said reservation is hereby secured to said Indians; and at all other usual and accustomed stations, in common with citizens of the United States, and of erecting suitable houses for curing the same; also the privilege of hunting, gathering roots and berries, and pasturing their stock on unclaimed lands, in common with citizens, is secured to them.[85]

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77. *See* CHARLES F. WILKINSON, CROSSING THE NEXT MERIDIAN 199-203 (Island Press 1992).

78. HANNA, *supra* note 2, at 8.

79. *Id.*

80. *Id.*

81. *Id.*

82. *See* WILKINSON, *supra* note 77, at 187.

83. *Id.*

84. *Id.*

85. Treaty with the Tribes of Middle Oregon art. 1, June 25, 1855, 12 Stat. 963. The other Stevens Treaties are: Treaty of Medicine Creek, Dec. 26, 1854, 10 Stat. 1132 (treaty between the United States and the following tribes: Nisqually, Puyallup, and Squaxin Island); Treaty of Point Elliott, Jan. 22, 1855, 12 Stat. 927 (treaty between the United States and the Dwamish, Suquamish, and Other Allied and Subordinate Tribes of Indians in Washington Territory); Treaty of Olympia, Jan. 25, 1856, 12 Stat. 971 (treaty between the United States and the Qui-nai-elt and Quil-leh-ute

Litigation beginning in the late 1960s established that these treaty rights had survived the passage of time. Tribes and American Indian individuals throughout the Northwest sued to require the states to regulate the fisheries to ensure that a "fair and equitable" share of anadromous fish were available to the tribes. In *United States v. Washington*,[86] the Federal District Court for the District of Washington defined the "fair and equitable" tribal share to be one-half of all salmon and steelhead not needed for spawning.[87] The Supreme Court affirmed this holding, but elaborated that "one half" of the runs was a maximum, not a minimum, and that tribes would only be entitled to the amount required to provide them with a moderate livelihood.[88] In the second phase of the *Washington* litigation, the district court addressed the states' obligations with regard to environmental quality and salmon survival.[89] The court found that the tribes had an implied right to protection of the salmon habitat, but that this was not absolute, and the state did not have affirmative duties to adopt new measures to protect the salmon, but only to exercise existing regulatory powers so as not to harm the habitat.[90] In addition to these landmark treaty cases, tribes throughout the region have litigated and sometimes settled individual cases involving water and other reserved rights affecting salmon runs.[91] In the wake of the litigation, an elaborate and effective regulatory structure has emerged. The Northwest Indian Fisheries Commission and the Columbia River Inter-Tribal Fish Commission monitor the ecological health of the streams in their respective regions and work cooperatively with state and federal agencies to effectuate tribal treaty rights.[92]

Climate change thus threatens to extinguish what tribes have fought for centuries to preserve. The backdrop of legal rights, including an implied though not absolute right to preserve the salmon's habitat,[93] create the likelihood of further litigation as the situation becomes more dire.

Indians); Treaty of Neah Bay, Jan. 31, 1855, 12 Stat. 939 (treaty between the United States of America and the Makah Tribe of Indians); Treaty of Point no Point, Jan. 26, 1855, 12 Stat. 933 (treaty Between the United States of America and the S'Klallams Indians); Treaty between the United States of America and the Nez Perce Indians, June 11, 1855, 12 Stat. 957; Treaty between the United States and the Walla-Walla, Cayuses, and Umatilla Tribes and Bands of Indians in Washington and Oregon Territories, June 9, 1855, 12 Stat. 945; Treaty between the United States and the Yakama Nation of Indians, June 9, 1855, 12 Stat. 951.

86. 384 F. Supp. 312 (W.D. Wash. 1974).

87. *Id.* at 343.

88. Washington v. Wash. State Commercial Passenger Fishing Vessel Ass'n, 443 U.S. 658, 686-87 (1979).

89. United States v. Washington, 506 F. Supp. 187, 190-91 (W.D. Wash. 1980).

90. *See id.* at 206-08.

91. *See, e.g.*, IDAHO DEP'T. OF WATER RES., THE NEZ PERCE WATER RIGHTS SETTLEMENT (May 15, 2004), *available at* http://www.idwr.idaho.gov/nezperce/index.htm.

92. *See* Northwest Indian Fisheries Commission, Overview of the NWIFC, http://www.nwifc.org/aboutus/index.asp (last visited Mar. 27, 2008) (providing an overview of the NWIFC); Columbia River Inter-Tribal Fish Commission, What Is CRITFC (2008), http://www.critfc.org/text/work.html (providing an overview of the CRITFC) (last visited Mar. 27, 2008).

93. *See* United States v. Washington, 506 F. Supp. at 190-191.

And while tribes have been able to adapt to changing circumstances by diversifying their economies, salmon remain indispensable to tribal culture and identity. Billy Frank, a Nisqually tribal member and leader who has led the battles over the Northwest fisheries, has said that "fishing defines the tribes as a people."[94] Tribal leaders throughout the region express the same sentiment. Chairman Antone Minthorn of the Umatilla Nation provided the following poignant testimony in congressional hearings about the collapse of the salmon runs: "It is almost impossible to describe in words the pain and suffering this has caused my people. We have been fisherman for thousands of years. It is our life."[95] And it is that life that, after all of the other legal, administrative, and political efforts, climate change threatens to extinguish.

B. Alaska: A Melting Landscape

The warming effects from greenhouse gas emissions are most evident at the poles of the earth, and in particular the North Pole.[96] As a result, Alaska has already experienced significant changes due to global warming, and scientists predict that the region will continue to become warmer and wetter throughout this century.[97] There are eleven distinct groups of Alaska Natives who are divided into five groups based on geographic proximity or cultural affinity: (1) the Athabascan in the East and interior; (2) the Yup'ik and Cup'ik in the West; (3) the Inupiaq and St. Lawrence Island Yupik of the North and Northwest; (4) the Aleut and Alutiiq of South Central Alaska and the Aleutian islands; (5) the Eyal, Tlingit, Haida and Tsimshian of the Southeastern archipelago.[98] Climate change is already affecting all inhabitants of Alaska, but could have particularly damaging effects on Alaska natives whose economic, social, cultural, and spiritual lives are bound up with the area's unique ecology.

1. Changing Climate in Alaska

Winter temperatures in the Alaska region have risen by six to eight degrees Fahrenheit over the last 50 years.[99] Under even a moderate greenhouse gas emissions scenario, average annual inland temperatures are predicted to rise by another six to 10 degrees Fahrenheit, and tem-

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94. Catherine A. O'Neill, *Risk Avoidance, Cultural Discrimination, and Environmental Justice for Indigenous Peoples*, 30 ECOLOGY L.Q. 1, 36 (2003).

95. Mary Christina Wood, *EPA's Protection of Tribal Harvests: Braiding the Agency's Mission*, 34 ECOLOGY L.Q. 175, 188 (2007) (quoting *Water Spreading: Hearing on Water Use Practices on Bureau of Reclamation Projects Before the H. Comm. on Natural Res., Subcomm. on Oversight & Investigations,* 103d Cong. (1994) (statement of Antone Minthorn, Chairman, Confederated Tribes of Umatilla Indian Reservation)).

96. *See* Gordon McBean et al., *Arctic Climate: Past and Present, in* ARCTIC CLIMATE IMPACT ASSESSMENT 21, 22-23 (Carolyn Symon et al. eds., Cambridge Univ. Press 2005), *available at* http://www.acia.uaf.edu/pages/scientific.html (quoting the 2001 reports of the Intergovernmental Panel on Climate Change).

97. *See id.* at 54.

98. HANNA, *supra* note 2, at 10.

99. *See id.*

peratures over the ocean will rise by another 14 degrees Fahrenheit.[100] Due to the acute warming, over the last 30 years, the average annual sea ice has decreased by roughly 8 percent, with even sharper than expected decreases occurring within the last year.[101] Other effects flowing from the rising temperatures include changes in vegetation, increases in forest fires and insect infestation, and severe coastal erosion.[102] The erosion is a result of the combined effects of rising sea levels, decreasing sea ice, and melting permafrost.[103] The first two effects combine to allow higher waves to reach the shoreline, and the third results in unstable soil that is more susceptible to being washed away.[104]

The changing climate in Alaska has already affected wildlife in the region. The plight of the polar bears, caused by the dramatic decline in sea ice as well as the higher temperatures, is well known.[105] But other species, including seals and sea lions, will have equal difficulty as the ice continues to recede. Inland, the changing vegetation will affect many bird species dependent on the flora of the tundra for nesting and breeding grounds. Some bird species, including several endangered sea birds, could lose as much as 50 percent of their breeding grounds within the century.[106] Caribou and reindeer might also decline as the tundra ecology changes and the vegetation these species rely on either disappears or moves northward.

The melting permafrost has also already caused disruption to humans. Ice highways over the tundra are thawing, resulting in transportation difficulties that will require significant reengineering to address.[107] Oil exploration has been cut in half due to the instability of the soil and consequent risk of environmental harm.[108] Future health effects could include the spread of West Nile virus and other infectious diseases.[109] The one potential benefit to humans that has been identified is that an absence of sea ice could prolong the shipping seasons as well as open new routes across the top of the world.[110]

2. Alaska Natives in a Melting World

The dramatic effects of warming have touched almost every aspect of life for Native Alaskans. A petition filed by Sheila Watt-Cloutier, a member of the Inuit Circumpolar Conference, before the Inter-American

100. *Id.*
101. *See id.* at 3, 10.
102. *Id.* at 10.
103. *Id.*
104. *See id.*
105. *See id.*; *see also* John M. Broder & Andrew C. Revkin, *Warming May Wipe Out Most Polar Bears, Study Says*, N.Y. TIMES, Sept. 8, 2007, at A11.
106. HANNA, *supra* note 2, at 10.
107. *See id.*
108. *Id.* at 10-11.
109. *Id.* at 11.
110. *See id.*

Commission on Human Rights alleges that the United States has violated various rights and norms of international law by contributing to global warming.[111] The Inuit Circumpolar Conference is comprised of all Inuit of the polar region, including those in Alaska.[112] While the territory is broader than that within the jurisdiction of the United States, the allegations in the petition aptly summarize the pervasive nature of global warming's impacts on Alaska's indigenous peoples:

> Inuit culture has developed over thousands of years in relationship with, and in response to, the physical environment of the Arctic. The Inuit have developed an intimate relationship with their surroundings, using their understanding of the arctic environment to develop a culture, including tools, techniques and knowledge, that has enabled them to subsist and thrive on the scarce resources available.[113]

That intimate knowledge is at risk, threatening the ability of Alaska Natives to build vibrant human communities. For example, elders have traditionally passed on centuries' worth of accumulated wisdom about how to read ice, snow, and other environmental conditions.[114] That wisdom is proving empty in a world of changing weather. Not only does the inability to read the weather make travel and hunting more dangerous, it also undermines the ability of the elder generations to teach the younger generations.[115] Climate change thus disrupts both the material practices that enable survival in harsh conditions and the cultural continuity that perpetuates those practices.

Due to climate change, Alaska Native communities are facing a cultural loss as profound as that suffered by the plains tribes when they were confined to reservations and forced to abandon the practices that gave their lives meaning.[116] As Professor Jonathan Lear describes in his eloquent book on the Crow leader Chief Plenty Coup, when the Crow Tribe was confined to a fraction of its former territory, and therefore unable to engage in the rituals and practices that gave meaning to being Crow, they suffered a form of cultural death more profound than what could have been achieved through criminalization of their spiritual practices:

> To make the point, allow me to speak in the first person as an imaginary Crow subject: Not only can I no longer plant a coup-stick, but nothing could count as my intending to do so. As it turns out, only in

111. *See* PETITION TO THE INTER AMERICAN COMMISSION ON HUMAN RIGHTS SEEKING RELIEF FROM VIOLATION RESULTING FROM GLOBAL WARMING CAUSED BY ACTS AND OMISSIONS OF THE UNITED STATES 1 (2005), *available at* http://www.earthjustice.org/library/legal_docs/petition-to-the-inter-american-commission-on-human-rights-on-behalf-of-the-inuit-circumpolar-conference.pdf [hereinafter INUIT PETITION].

112. *See id.* at 1, 9.

113. *Id.* at 35.

114. *Id.* at 78.

115. *Id.*

116. *See id.*

> the context of vibrant tribal life can I have any of the mental states that are salient and important to me. The situation is even worse: these are the mental states that help to constitute me as a Crow subject. Insofar as I am a Crow subject there is nothing left for me to do; and there is nothing left for me to deliberate about, intend, or plan for. Insofar as I am a Crow subject, *I* have ceased to be.[117]

So too, many Native Alaskan communities are looking at a future where they, in this profound cultural sense, may cease to be.

Some of the effects of warming in the region are even more concrete. Rising sea levels, melting sea ice, and thawing permafrost are causing coastal erosion that is destroying some Native villages.[118] The General Accounting Office found that more than 86 percent of the 216 Alaska Native villages are already subject to flooding and erosion, and that this perennial problem is likely to become worse due to warming temperatures.[119] The villages of Kivalina, Koyukuk, Newtok and Shishmaref are severely affected and will have to relocate, which is not only painful to community members, but also very expensive.[120] Relocating Kivalina, for example, has been estimated to cost $1 million per villager.[121]

The legal status and rights of Alaska Natives differ from those of American Indian tribes in the lower 48 states. Yet, similar to the tribes of the Pacific Northwest, the Southwest, and Florida, Alaska natives do have unique legal claims that are implicated by the effects from climate change. The Alaska Native Claims Settlement Act (ANCSA),[122] enacted in 1971, extinguished all claims to aboriginal title and associated hunting and fishing rights in exchange for Alaska Natives' selection of ownership of approximately 45 million acres of land, $462.5 million in congressional appropriations, and $500 million in expected state revenues from oil royalties.[123] ANCSA also provided for the land and money to be distributed to Native local and regional corporations, rather than directly to existing tribal governments.[124] Despite ANCSA's obvious assimilationist bent, Congress intended for Native Alaskans' traditional subsistence activities to be protected by the Department of the Interior.[125] When it became clear that subsistence rights were being insufficiently protected

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117. *See* JONATHAN LEAR, RADICAL HOPE: ETHICS IN THE FACE OF CULTURAL DEVASTATION 49-50 (Harvard Univ. Press 2006) (emphasis in original).

118. U.S. GEN. ACCOUNTING OFFICE, PUBL'N NO. 04-142, ALASKA NATIVE VILLAGES: MOST ARE AFFECTED BY FLOODING AND EROSION, BUT FEW QUALIFY FOR FEDERAL ASSISTANCE 7-8 (2003).

119. *See id.* at 2-3.

120. *See id.* at 4.

121. *See id.*

122. 43 U.S.C.A. § 1601 (West 2008).

123. *See* 43 U.S.C.A. §§ 1603, 1605-06, 1608 (West 2008).

124. 43 U.S.C.A. § 1628 (West 2008).

125. *See* HANNA, *supra* note 2, at 14.

after ANCSA, Congress passed the Alaska National Interest Lands Conservation Act (ANILCA)[126] which establishes priorities for subsistence activities based on rural residency rather than Native status.[127] Nonetheless, the statute provides a legal basis for Alaska Natives, as well as their non-Native neighbors engaging in subsistence lifestyles, to continue to use federal lands to engage in subsistence activities.[128] ANILCA's regulatory structure allows for participation by Native Alaskans in the formulation of subsistence policies.[129] Several other federal statutes reinforce Alaska Native subsistence rights by preempting state regulation of certain activities such as game hunting, reindeer herding, and whaling.[130] While these rights arguably have less bite than treaty rights, they nonetheless contribute to the justice claims that Alaska Natives may assert in response to climate change, and at a minimum should put lawmakers on notice that serious legal issues will be on the horizon even if we act swiftly to mitigate global warming. Alaska is already melting, and Alaska Natives are on the forefront of climate activism as a result.[131]

C. Southwest: Water Scarcity

There are more than 70 federally recognized Indian tribes in the Southwest, all of which rely on the region's scarce water resources to survive.[132] The Southwest is the heart of the arid region, receiving less than 10 inches of rainfall on average each year.[133] Tribes, like the Hopi, that have lived in the Southwest for millennia have cultural and religious ceremonies that revolve around maintaining the health and wellbeing of their sacred springs.[134]

1. Climate Change in the Southwest

Not surprisingly, the signature effect of climate change in this region will be water scarcity.[135] Model projections range, but all predict declining precipitation as temperatures increase.[136] One study projected

126. 16 U.S.C.A. § 3101 (West 2008).
127. 16 U.S.C.A. § 3111 (West 2008).
128. *See* 16 U.S.C.A. §§ 3111, 3115 (West 2008).
129. In furtherance of ANILCA's mandate, the Secretaries of Agriculture and the Interior established the Federal Subsistence Board to oversee management of subsistence activities on federal lands and waters of Alaska. *Id.* §§ 3112, 3115. In 1993, the Board established 10 regional advisory councils, and Alaska Natives are well represented in these councils. *See generally* FRANK NORRIS, U.S. DEP'T INTERIOR, ALASKA SUBSISTENCE: A NATIONAL PARK SERVICE MANAGEMENT HISTORY ch.7 (2002).
130. *See* Endangered Species Act, 16 U.S.C.A. § 1531 (West 2008); Reindeer Industry Act of 1937, 25 U.S.C.A. § 500 (West 2008); Marine Mammal Protection Act, 16 U.S.C.A. § 1361 (West 2008).
131. *See, e.g.*, INUIT PETITION, *supra* note 111, at 10-11.
132. *See* HANNA, *supra* note 2, at 18.
133. U.S.G.S., EFFECTS OF CLIMATIC VARIABILITY AND LAND USE ON AMERICAN DRY LANDS 1 (2004), *available at* http://esp.cr.usgs.gov/info/sw/maps.html.
134. *See* Whiteley & Masayesva, *supra* note 31, at 10.
135. HANNA, *supra* note 2, at 19.
136. *See* IPCC: THE PHYSICAL SCIENCE BASIS, *supra* note 39, at 16 fig. SPM7.

that a 2 degrees Celsius temperature rise could result in a 20 percent reduction in stream flows to the Colorado River basin.[137] Another predicted a decrease ranging between seven to 20 percent.[138] All studies predict increasing precipitation falling as rain rather than snow, and earlier and shorter spring run-offs.[139] Even without certainty as to decreasing amounts of precipitation, these changes are enough to result in less water for the entire region.

2. Effects on Southwest Tribal Water Rights

Just as the Pacific Northwest tribes have powerful legal rights to fish, Southwest tribes have powerful rights to water, at least on paper. By virtue of the *Winters* doctrine, most tribes have a priority water right that dates back to the creation of their reservations.[140] In the West, water rights are typically determined by the doctrine of prior appropriation, which grants superior rights to the user who is first in time to divert the water.[141] *Winters* reserved rights are superior to most prior appropriation claims because of the pre-settlement dates of many treaties.[142] Thus, legally, tribes have rights to water that threaten to up-end existing patterns of diversion and use. In the real world, however, tribes' paper rights have often not stood up to existing diversions.[143]

Some tribes have entered into settlements regarding their water rights, but many others have not. As of 2004, Congress had approved of 18 such settlements with Indian tribes.[144] Whether tribal water rights are settled, adjudicated, or as yet unquantified, global warming's effects on water will only heighten the tension that exists with regard to access to the West's most precious and scarce resource. For all Southwest tribes—and the Hopi can perhaps stand in here as shorthand—the consequences are more than just economic. They are religious and cultural.[145] They are about a way of life and attachment to land and its creatures that has existed for millennia, adapting in many ways to changing circumstances, but not ready or willing to adapt to life without their sacred waters. If historical practices are any guide, tribal legal rights and the moral claims that back them up will be vulnerable to the greater political power that

137. HANNA, *supra* note 2, at 19.

138. *Id.*

139. *See id.* at 6.

140. *See* Winters v. United States, 207 U.S. 564, 564 (1908) (holding that the Fort Belknap Tribe's treaty impliedly reserved water rights for the reservation notwithstanding the absence of express language to that effect).

141. HANNA, *supra* note 2, at 22.

142. *See id.* at 23.

143. *See* WILKINSON, *supra* note 77, at 219-31 (describing effects of pre-existing diversions and massive reclamation projects on Jicarilla Apache and Navajo claims to water).

144. THE HARVARD PROJECT ON AMERICAN INDIAN ECONOMIC DEVELOPMENT, THE STATE OF NATIVE NATIONS: CONDITIONS UNDER U.S. POLICIES OF SELF DETERMINATION 170 (2008) [hereinafter THE STATE OF NATIVE NATIONS].

145. *See* Whiteley & Masayesva, *supra* note 134, at 15 (describing Hopi ceremonies and beliefs surrounding water and their sacred springs).

rests with competing water users in the region, including large and growing cities, metropolitan districts, and agricultural interests.[146]

D. Florida: Rising Sea Levels

Florida's two tribes, the Seminole and the Miccosukee, are descended from tribes throughout the region whose members migrated south to escape conflict with other tribes as well as European and American persecution.[147] Members from the Creek, Hitchiti, Apalachee, Mikisuki, Yamassee, Yuchi, Tequesta, Apalachicola, Choctaw, and Oconee joined together, along with some escaped slaves, to form the two groups that now are Florida's federally recognized Indian nations.[148] Florida will be seriously affected by climate change, predominately due to rising sea levels and rising temperatures, as well as increased frequency and severity of extreme weather events.[149]

1. Climate Change in Florida

The most dramatic impact of climate change for Florida tribes stems from the predicted rise in sea levels in that region.[150] Over the next century, a rise of anywhere from eight to 30 inches is possible, which could result in an advance of up to several hundred feet on Florida's gradually sloped shoreline.[151] Florida has approximately 4,500 square miles of land within five feet of sea level.[152] Much of this low elevation consists of the Everglades in the southern tip of Florida.[153] Rising temperatures will also have profound effects in the region. The heat index is predicted to rise by as much as eight to 15 degrees Fahrenheit over the next 100 years, affecting public health, agriculture, and ecosystems throughout the state.[154]

2. Effects on Florida Tribes: Inundation of Reservation Lands

The Seminole and Miccosukee have reservation lands in and around the Everglades, and they use its mangrove forests, cypress domes, and saw grass prairies for hunting, gathering, and other traditional subsistence activities.[155] The rising sea levels, changing weather patterns, elevated temperatures, and saltwater intrusion all could have devastating

146. *See* WILKINSON, *supra* note 77, at 219-26; *see also* MARC REISNER, CADILLAC DESERT 255-305 (Penguin Books 1986) (recounting the machinations to get water to Arizona and California and noting the tribes' powerful paper rights).

147. HANNA, *supra* note 2, at 24.

148. *Id.*

149. *Id.*

150. *Id.* at 26.

151. *Id.* at 25.

152. ENVTL. PROT. AGENCY, PUBL'N No. 430-F-02-007, SAVING FLORIDA'S VANISHING SHORES 5 (2002) *available at* http://www.epa.gov/climatechange/effects/coastal/saving_FL.pdf.

153. *Id.*

154. *See* HANNA, *supra* note 2, at 25.

155. *Id.* at 26.

effects on this region and the plants and animals on which the tribes rely to support their traditional practices. Flooding could result in the direct loss of tribal lands, significant portions of which are in the most vulnerable areas. For example, the Seminole Tribe's Hollywood reservation is located in the coastal area around Ft. Lauderdale and their Big Cypress reservation is in a low-lying wetland southeast of Ft. Myers.[156] Similarly, the Miccosukee Tribe's lands are near Miami and the Everglades.[157] Tribal land loss threatens not just tribal homes, but also the ability to engage in cultural and religious practices. Both the Seminole and the Miccosukee have a long history of subsistence activities, including hunting, fishing, and growing crops in the Everglades.[158] Traditional ceremonies, such as the annual Green Corn Dance that brings tribal clans together to celebrate the harvest, socialize, and settle grievances, are at risk if climate change disrupts or eviscerates the possibility of a harvest.[159]

Climate change will also affect tribal economies in ways similar to the impacts on the rest of Florida. The Seminole have profitable citrus and sugar cane operations, and rising temperatures, increasing storms, and changing water tables will make these more volatile and less profitable.[160] Tourism, likewise, is a source of income and economic development for both tribes, and is linked to the tribes' gaming revenues.[161] Both of these non-agricultural sources of income are also vulnerable due to Florida's poor climate outlook.[162]

Like the tribes of the Pacific Northwest and the Southwest, the Seminole and Miccosukee have legal rights both to their land and to engage in their traditional hunting and other practices. The Seminole Tribe settled a land claims dispute with Florida and the South Florida Water Management District in 1987, securing rights to continue traditional ceremonial and subsistence practices.[163] The Seminole also retained rights in Everglades National Park and Big Cypress that were previously recognized.[164] The Miccosukee Reserved Area Act reserved a section of the Everglades for the Miccosukee, and recognized rights to use lands and waters in the park for fishing, boating, and cultural and religious practices.[165] Like the Seminole, the Miccosukee have customary use

156. *Id.*
157. *Id.*
158. *Id.*
159. *Id.*
160. *Id.* at 26-27.
161. *Id.* at 27.
162. *Id.*
163. *Id.*
164. *Id.*
165. *Id.*

rights to land in the Big Cypress area.[166] All of these rights, like those of the other tribes discussed, may become meaningless in a warming world.

E. Proposals to Meet Our Unique Obligations to American Indian Tribes

The *Native Communities and Climate Change* Report (Report) makes several recommendations to Congress regarding measures to address the effects of climate change on American Indian tribes.[167] The first is an important procedural one regarding the necessity of tribal input and participation. The Report suggests that Congress should hold congressional hearings to gather information from tribes themselves before enacting any provisions into legislation.[168] Further, as Congress expands the administrative capacity for responding to climate change, it should establish ongoing channels of communication with tribes and their representatives so that tribal nations can be involved in the process of formulating climate policy.[169] These consultation measures are essential to creating climate change solutions that will be effective for tribes. The history of federal relations with tribes indicates that policies with the harshest effects on American Indians were those crafted without their consultation and consent.[170]

Second, the Report suggests that Congress should include an adequate revenue raising mechanism in climate change legislation to respond to tribes' costly adaptation needs, as well as to fund tribal mitigation programs.[171] To date, Congress has not passed any serious carbon emissions reduction legislation. But several bills have been introduced, most of which propose a cap-and-trade scheme to limit emissions.[172] Only one bill has proposed a carbon tax, which is the preferred approach of most economists[173] and may also be the best alternative for meeting our obligations to American Indian tribes. Carbon taxes, if calibrated accurately, are the most efficient route to achieve emissions reductions.[174] They also have the benefit of a revenue stream that would exist as long as the tax takes to achieve the eventual desired result of zero-

166. *Id.*
167. *Id.* at 30-31.
168. *Id.* at 30.
169. *Id.*
170. *See* THE STATE OF NATIVE NATIONS, *supra* note 144, at 3-5 (recounting briefly the history of United States-American Indian relations). This history reveals that the most damaging policies, such as allotment and termination, were crafted and implemented without meaningful tribal consultation and that even well-intentioned efforts faltered due to excessive control by the federal government. *See id.* at 4 (describing the Indian Reorganization Act policies, which gave inordinate control to the Secretary of the Interior).
171. HANNA, *supra* note 2, at 30-31.
172. *See* Victor B. Flatt, *Taking the Legislative Temperature: Which Federal Climate Change Legislative Proposal Is Best?*, 102 NW. U. L. REV. COLLOQUY 123, 135 (2007) (analyzing climate change bills introduced in the 110th Congress), *available at* http://www.law.northwestern.edu/lawreview/colloquy/2007/32/.
173. *Id.* at 135, 138.
174. *See id.* at 138-39; *see also* CARBON TAX CENTER, INTRODUCTION (2007), http://www.carbontax.org/introduction/#cap-and-trade (last visited Mar. 27, 2008).

emissions. While cap-and-trade systems can also generate revenue if the initial allowances are auctioned to emitters, as proposed by some of the congressional bills, there are greater risks of cheating, rent-seeking and other non-compliant behaviors under cap-and-trade regimes.[175] The Report does not take a position on a cap-and-trade regime versus a carbon tax,[176] but it would behoove legislators to take seriously the benefits of a carbon tax given the inevitable need for government funding to address our legal and moral obligations to tribes.

Third, the Report recommends that Congress invest in alternative energy development on tribal lands.[177] Tribes have significant capacity for wind, solar, and other forms of renewable energy.[178] Some have already begun to develop their renewable energy resources with assistance from existing federal programs.[179] As this sector of the economy becomes more important and profitable, the federal government should make sure that tribes are not left out of any emerging incentive structure.

As the Report and its suggestions make plain, to address legal and moral obligations to tribes, Congress will have to provide for sufficient funding for the unique adaptation challenges tribes face. Congress should also, however, adopt a national mitigation strategy that is effective, that provides incentives to develop alternative energy and technology, and that includes a revenue stream to address adaptation inequities. The reason for stressing the need for effective mitigation is that if the United States (and therefore the world) fails to reverse global warming, much of what matters to tribes spiritually and culturally will be lost, as discussed above in Parts I and II. Without mitigation, not only will adaptation be a never-ending endeavor, it may eventually be an unintentional exercise in tribal termination, if what it means to be a tribe is to retain a distinctive worldview and culture. This leads us, however, to the difficult subject of whether we have the ethical framework necessary to adopt effective mitigation strategies.

III. SAVING THE WORLD TO SAVE NATIVE COMMUNITIES, OR VICE VERSA?

The disproportion between American Indian contributions to global warming and the negative effects on tribal communities is part of a larger global story of climate injustice. The developed countries, including most significantly the United States, are responsible for two-thirds or

175. *See* Tom Redburn, *The Real Climate Debate: To Cap or to Tax?*, N.Y. TIMES ONLINE, Nov. 2, 2007, http://www.nytimes.com/2007/11/02/us/politics/04web-redburn.html.

176. *See* HANNA, *supra* note 2, at 30-31.

177. *Id.* at 31.

178. *See* THE STATE OF NATIVE NATIONS, *supra* note 144, at 161-62.

179. *See, e.g.*, NATIVEENERGY, OUR PROJECTS, http://www.nativeenergy.com/pages/our_projects/14.php (last visited Mar. 27, 2008) (providing a list of tribal wind and other renewable energy projects).

more of historical greenhouse gas emissions.[180] Yet underdeveloped and developing nations will experience more serious impacts.[181] There are interrelated reasons for this. Many developing nations are located at latitudes that are more vulnerable to changes in surface temperature and its consequent effects on soil, water availability, and local weather.[182] In addition, developing nations, by definition, are poorer than developed nations, and have fewer economic resources to devote to adaptation measures. Further, many economies within developing nations are centered on local natural resources, the alteration or destruction of which will therefore have dramatic economic and cultural effects.[183] For Africa, for example, the IPCC Fourth Assessment Report expressed high confidence that, among other effects:

> by 2020, between 75 and 250 million people will be exposed to an increase of water stress due to climate change;
>
> local food supplies will be negatively affected by decreasing fisheries in large lakes due to rising temperatures;
>
> agricultural production, including access to food, will be severely compromised by climate variability and change.[184]

As the IPCC Fourth Assessment Report dryly concludes, "Africa is one of the most vulnerable continents to climate variability and change because of multiple stresses and low adaptive capacity."[185] While the details vary greatly, the IPCC and other sources report a similarly disparate vulnerability for virtually all underdeveloped and developing regions.[186]

The developed nations, by contrast, have not only benefited economically from their historical greenhouse gas emissions, they have also begun to spend some of that wealth on adaptation programs. For example, desalination projects are in the planning stages for arid regions in the United States and Australia.[187] The Netherlands has begun to modify its infrastructure to prepare for rising sea levels, including constructing amphibious housing and planning for entire floating cities.[188] California and other western American states are well into planning processes for how

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180. *See* Stephen M. Gardiner, *Ethics and Global Climate Change*, 114 ETHICS 555, 579 n.75 (2004). Exact figures vary somewhat depending on the method of analysis.

181. *See, e.g.*, IPCC: IMPACTS, ADAPTATION AND VULNERABILITY, *supra* note 39, at 412.

182. *See, e.g., id.* at 394.

183. *See, e.g., id.* at 413-15.

184. *Id.* at 13.

185. *Id.* at 8.

186. *See id.* at 12-15.

187. *See Applause, at Last, for Desalination Plant*, TAMPA TRIB., Feb. 22, 2007, at A16; *Sydney Desalination Plant to Double in Size*, AUSTL. BROAD. CORP. NEWS, June 25, 2007, http://www.abc.net.au/news/stories/2007/06/25/1961044.htm.

188. Matt Bradley, *Dutch Design Lets Homes Float on the Floodwaters*, CHRISTIAN SCI. MONITOR, Oct. 26, 2005, at A13.

to adapt their water storage facilities.[189] So while global warming ultimately will be democratic, in that no one anywhere will be beyond its effects, wealthy nations will be less vulnerable initially, and will be better able to manage the consequences.

Complicating the equitable issues even further, poor people, regardless of where they live, will suffer more from the effects of global warming. As Dale Jamieson has put it, "this pattern of the poor suffering most from extreme climactic events has been documented as far back as the 'little ice age' that occurred in Europe from 1300 to 1850."[190] Close to home, Hurricane Katrina highlighted the disproportionate effects of extreme weather on poor and minority populations, and the lessons from Katrina are relevant regardless of whether that particular storm was intensified or caused by climate change, given the IPCC's predictions regarding increases in extreme weather, including heat waves, droughts, heavy precipitation, and tropical storms.[191]

Global warming thus presents questions about obligations that the global community owes to vulnerable populations, other species, and future generations. There are also issues concerning whether developed nations, which have benefited from unregulated emissions, should have a higher obligation to reduce global emissions today and in the future. And for some countries, in particular the United States, there is a question of whether that obligation should be further heightened by obdurate behavior since the late 1980s, which may well have cost the entire world several precious decades during which un-recoupable progress might have been made.

Despite these various compelling reasons to see global warming in moral and ethical terms, many do not perceive it as a moral issue. According to Dale Jamieson, "[a] paradigm moral problem is one in which an individual acting intentionally harms another individual; both the individuals and the harm are identifiable; and the individuals and the harm are closely related in time and space."[192] The spatial and temporal dispersion that defines global warming makes these identifications and connections particularly difficult to make.[193]

The difficulties are exacerbated by the fact that the behavior constituting the harm was (and for many still is) simply living a normal life in a wealthy, developed country. Consider my very own maternal grand-

189. *See, e.g.*, STATE OF CALIFORNIA OFFICE OF THE GOVERNOR, GOVERNOR CALLS FOR AGREEMENT ON COMPREHENSIVE WATER INFRASTRUCTURE PLAN (Nov. 13, 2007), http://gov.ca.gov/issue/water-supply.

190. Dale Jamieson, *Adaptation, Mitigation, and Justice*, 5 ADVANCES IN ECON. OF ENVTL. RESOURCES 217, 227 (2005).

191. *See* IPCC: IMPACTS, ADAPTATION AND VULNERABILITY, *supra* note 39, at 15.

192. Dale Jamieson, The Moral and Political Challenges of Climate Change 1 (Mar. 14, 2008) (unpublished manuscript) (on file with author).

193. *See id.* at 1-3.

parents. They drove two big Buicks for many years, lived in an apartment heated and cooled by fossil fuels, and, in their later years, flew all over the globe to travel. While I am not certain about this, it seems likely that my grandmother never once took public transportation to get anywhere in her hometown of Columbus, Ohio. By living this (from their perspective, hard-earned, up from the shtetl, American dream of a) life, they, along with similarly situated U.S. residents, have contributed to more than one third of the global emissions that have put us in this climactic bind. Yet when they drove to the kosher butcher or boarded the plane to fly to Santiago, Chile, they had no sense that they were contributing to a global crisis that would affect many future individuals and non-human species. In addition the "harm" that they did cannot be disaggregated from the harms done by all other carbon emitters. Further, the victims of the harms are equally dispersed in time and space. They are island dwellers who may lose their homes in the twenty-first century, Inuit seal hunters today, and perhaps residents of Manhattan several generations from now.

Recently, increasingly emphatic statements by the IPCC (and the climate science community generally) about the causes and effects of global warming have begun to overcome these obstacles to perceiving global warming as a moral issue. While the link between facts and values may be forever fraught and contested, the more we know about the connections between our actions and their effects, the less difficulty we have in accepting ethical constraints on our behavior. As put slightly differently by E.O. Wilson, "[w]hen very little is known about an important subject, the questions people raise are almost invariably ethical. Then as knowledge grows, they become more concerned with information and . . . more narrowly intellectual. Finally, as understanding becomes sufficiently complete, the questions turn ethical again."[194] Thus, despite the challenges of spatial and temporal dispersion, it is apparent that a moral vocabulary is emerging. People all over the world, including several prominent American politicians, are expressing values of caring for future generations, other species, and particular vulnerable populations.[195] These articulations correlate with the mounting scientific evidence of what we have wrought. Despite the ethical distance many may have to travel to get from the paradigm moral problem of, "I knowingly hurt you," to "I, along with billions of others, am living my life in such a way as to deprive distant and/or future human beings and non-

194. EDWARD O. WILSON, BIOPHELIA 119 (Harvard Univ. Press 1984).

195. *See, e.g.*, Juliet Eilperin, *Lawmakers on Hill Seek Consensus on Warming*, WASH. POST, Jan. 31, 2007 at A6 (quoting lawmakers as urging action on global warming in order to protect future generations); Press Release, Office of the Governor, Gov. Schwarzenegger Signs Landmark Legislation to Reduce Greenhouse Gas Emissions (Sept. 27, 2006), http://gov.ca.gov/index.php?/press-release/4111/ (discussing Governor Schwarzenegger's speech urging action on global warming to protect future generations).

human species of a range of opportunities for an acceptable and/or flourishing life," we are beginning to make the trip.

A. Sustainability: Remarrying Humans and Nature

Despite the local and global emergence of various versions of an ethic that might equip us to take action on climate change, the United States has not internalized one as a matter of policy. There are and have been some important nods in that direction. But the prevailing norm since the turn of the millennium has been an antediluvian (or ante-Earth Day, anyway) version of utilitarianism, which reduces all manner of values, obligations, and concerns to a unitary economic measure.[196] This approach, derived from welfare economics,[197] currently dominates a great deal of environmental and natural resource decision-making. The executive agencies of the federal government are required, for example, to apply cost-benefit analysis to a wide range of proposed agency action.[198] In such a system, attachment to nature, whether spiritual or otherwise, has no greater *a priori* ethical weight than the preference for a bigger ski area, or a faster snowmobile ride.

What global warming may do is catapult us beyond this way of thinking. Addressing global warming will mean rethinking what growth and development should consist of. The world within which growth can take place has always been defined by our ethics. We do not, for example, include the possible economic benefits of free labor from slaves or children when we consider whether or not to issue permits for construction of a factory. What the problem of worldwide greenhouse emissions will do, however, is render apparent that the ethical constraints on our behavior come from many directions. Global warming makes visible the heretofore hidden kinds of exploitation that, if we were forced to think about them on a daily basis, should give us pause. For example, we might ask ourselves: Is it really worth displacing other people from their families and homes just so I can drive a big car; does my ski trip to Canada really measure up against the last drop of water in the Hopi's sacred aquifer? We might begin to see our daily behavior in light of its temporally and spatially dispersed, yet very real, effects.

Fortunately, we are not starting from scratch. Sustainability, an approach both centuries old and recently articulated, marries the ethical insights from the environmental movement with those from the human rights framework. It embodies the idea of viewing human and natural systems as interconnected, and of meeting all human needs in a manner that supports the health of the environment. "Sustainable development"

196. *See generally* FRANK ACKERMAN & LISA HEINZERLING, PRICELESS: ON KNOWING THE PRICE OF EVERYTHING AND THE VALUE OF NOTHING (The New Press 2004).

197. *See id.* at 81-84.

198. Exec. Order No. 13,422, 72 Fed. Reg. 2763 (Jan. 18, 2007) (requiring "market failure" assessment of all planned agency action, and annual cost benefit analysis of all agency rules).

became a term of art after the publication of the Brundtland Report, which was the final report by the World Commission on Environment and Development.[199] The publication explores environmental and development issues in tandem, and concludes that governments world-wide must take simultaneous efforts to address poverty and environmental degradation so that meeting the basic needs of humanity is not perpetually in tension with the long-term health of the environment. As the publication explains:

> There has been a growing realization in national governments and multilateral institutions that it is impossible to separate economic development issues from environment issues; many forms of development erode the environmental resources upon which they must be based, and environmental degradation can undermine economic development. Poverty is a major cause and effect of global environmental problems. It is therefore futile to attempt to deal with environmental problems without a broader perspective that encompasses the factors underlying world poverty and international inequality.[200]

The report called on all nations of the world to adopt eight principles in order to integrate sustainable development into their policies. The principles are: (1) to revive growth in order to alleviate poverty, both for equitable and environmental reasons (noting that poverty is a major cause of environmental degradation); (2) to change the quality of growth: "[r]evived growth must be of a new kind in which sustainability, equity, social justice, and security are firmly embedded as major social goals"; (3) to conserve and enhance the resource base: "[s]ustainability requires the conservation of environmental resources such as clean air, water, forests, and soils; maintaining genetic diversity; and using energy, water, and raw materials efficiently"; (4) to ensure a sustainable level of population: "[p]opulation policies should be formulated and integrated with other economic and social development programmes—education, health care, and the expansion of the livelihood base of the poor"; (5) to reorient technology and manage risks; (6) to integrate environment and economics in decision-making; (7) to reform international economic relations; and finally (8) to strengthen international cooperation.[201]

A deep version of sustainability prescribes a way of living on the earth for all of us that allows each of us, in the company of nature, to thrive, but that proscribes any of us from living beyond our ecological means. Our "ecological means" now include our greenhouse gas emissions, which provide a material link between the many activities that render a consumption-oriented culture and economy unsustainable. The blueprint for such a worldview is available to us; it is the worldview em-

199. OUR COMMON FUTURE, *supra* note 11, at 8-9.
200. *Id.* at 3.
201. *Id.* at 363-65.

braced by American Indian tribes, described in Part II, *supra*. In his dissent in *Lyng v. Northwest Cemetery Protective Ass'n*, Justice William Brennan observed that Native American religions

> regard creation as an on-going process in which they are morally and religiously obligated to participate. . . . *Native Americans fulfill this duty through ceremonies and rituals designed to preserve and stabilize the earth and to protect humankind from disease and other catastrophes*. Failure to conduct these ceremonies in the manner and place specified . . . will result in great harm to the earth and the people whose welfare depends upon it.[202]

This is not a static, romanticized vision of people living in perpetual harmony with nature; rather it describes an ethical attitude that takes the form of daily habits and physical engagement, and is one that is strikingly well suited to the kinds of behavioral changes that will have to occur in a zero-emissions world.

Recently, many non-Indian communities committed to action on climate change have expressed these kinds of values, both in their positive laws and in their statements about why they are committed to addressing global warming. States, regions, cities, and even informal community groups have adopted emissions reductions goals and behaviors.[203] To provide just one example, recently in England, small groups have formed whose members pledge to one another to live low-carbon lives. Carbon Rationing Action Groups, or CRAGS, as they are called, are communities that keep one another true to their principles by formulating a yearly limit of emissions for members and then meeting regularly to monitor one another. According to a recent New York Times article, there are currently 160 people active in some twenty CRAGS across Britain.[204] The CRAG described in the Times has a yearly limit of 9,000 pounds of CO_2 per member. To put this in perspective, a single round-trip plane flight between London and Hong Kong generates 4,800 pounds of carbon. To meet their goals, members are changing their daily habits, using less light and different sources of fuel. According to the New York Times, CRAG member

> Jacqueline Sheedy has turned the former coal barge where she lives into a shrine to energy efficiency: she reads by candlelight in midwinter, converts the waste from her toilet into fertilizer, and hauls fresh water home on a trailer attached to her bicycle. Now Ms.

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202. Lyng v. Nw. Indian Cemetery Protective Ass'n, 485 U.S. 439, 460 (1988) (Brennan, J., dissenting) (citation omitted) (emphasis added).

203. *See* Sarah Krakoff, *Fragmentation, Morality, and the Law of Global Warming* 31-39 (University of Colorado Law School Legal Studies Research Paper Series, Working Paper No. 07-10, 2007), *available at* http://ssrn.com/abstract=976049.

204. James Kanter, *Members of New Group in Britain Aim to Offset Their Own Carbon Output*, N.Y. TIMES, Oct. 21, 2007, at A12.

> Sheedy has set herself a new goal: to stop burning coal for heat and instead use wood from renewable sources.[205]

Notwithstanding the relative intransigence of national and international governing institutions, many people at local levels have begun to live as if they could indeed participate in the creation of a sustainable world.

B. The Futility of Ethical Convergence?

Global warming provides the over-arching material connections that might render the ethical paradigm of sustainability concrete, meaningful, and urgent. CRAGs in England, cities and states throughout the United States, and individuals, communities, and countries world-wide appear to be internalizing just such an ethic despite the daunting spatial and intergenerational collective action features of global warming. In addition, we may finally be on the verge of achieving the external legal framework and accompanying government enforcement and coordination that would give full expression to the sustainability norm. And yet there remains the distinct possibility that we, as a global community, will fail to rein in our emissions in time to avert serious consequences. If we cannot act in time to preserve Native Alaskan subsistence traditions from devastation; if the Hopi's sacred waters dry up; if the Everglades are already a goner; if wild salmon and the cultures they sustain go extinct, is a restricted carbon diet just a hair-shirt exercise in futility?

There are two answers to this. The first is practical, and the second is metaphysical. Practically, in perpetuity there will be reason to reduce our greenhouse gas emissions even if we keep missing our mark. Absent miracle technological solutions (which at the moment are remote and will, in all likelihood, always be difficult to assess in terms of unintended consequences), the more emissions we add to the atmosphere, the warmer we will get. So even if we blow past the 2-4 degree increase that some scientists suggest could result in catastrophic effects, we will then want to focus on not getting to 8-10, or 10-12, or 12-14 degrees of average temperature increase, will we not? To those who might suggest that the potential futility of ever achieving a zero-emissions world points towards "adaptation only" policies, the rejoinder is that even adaptation will be an ever-changing proposition if we never stabilize global temperature increases.

Metaphysically, the likelihood of futility in the climate change context might be seen as a heightened version of the futility that haunts the entire human experience. The impulse to be good rarely comes with an accompanying guarantee of success. Yet there are other rewards in terms of how we feel about ourselves and our lives; our sense of meaning irre-

205. *Id.*

spective of positive results in our lifetimes. And to mingle the metaphysical with the practical, fostering the daily habits and rituals that reflect the ethic of climate sustainability might also prepare us and our progeny for a world of protean resource scarcity. Learning to live more locally and engaging in regular activities of caring for where we live might be the perfect ethical, cultural and social skill for life in a perpetually warming world.

CONCLUSION

In the fall of 2008, I taught an Advanced Indian Law seminar on American Indian Religion and Culture. Two of our classes covered sacred sites on public lands. We read *Lyng* and several lower court cases addressing these issues. We also took a field trip to the sacred site in our own back yard. Valmont Butte is east of downtown Boulder and is known to most local residents, if indeed it is known at all, as the rocky outcropping near the waste disposal facility. Perhaps in part because of this association, the City of Boulder bought the land several years ago intending to use it for firefighter training and a bio-composting site.[206] As soon as the City's plans became apparent, American Indian community members came forward to protest.[207] To them, Valmont Butte is a sacred site—a place of great spiritual significance to the tribes that used to inhabit this region and an ongoing location for ceremonies and caretaking by many tribes.[208] The American Indian constituents joined with a group of non-Indians whose ancestors had established a pioneer burial ground on the Butte to form the Valmont Butte Heritage Alliance (VBHA). Eventually, the City backed off of its plans and a settlement involving the possible transfer of the site to a land trust is moving forward.[209]

The afternoon was cold and grey, and a soft drizzle began to fall as my students and I got out of our cars in the muddy pull-out near Valmont Butte. Lori Windle, a VBHA board member, met us there, and then we hiked up the hill and were introduced to Nick Halsey, an Ojibwe tribal member who had lived at the Butte for two years. Nick was wearing a blue hooded sweatshirt and a baseball cap, blue jeans and work boots. If my students were expecting regalia and eagle feathers, they might have been disappointed. Nick was quiet for a time, and then said a prayer. He led us up past a couple of decrepit shacks, through a barbed wire fence, and up the trail to where he had set up a sweat lodge and a prayer circle. As he walked, he explained to us how contaminated the area was. Metals, including uranium, and a lot of ordinary trash polluted the Butte. He

206. VALMONT BUTTE HERITAGE ALLIANCE, EVENT TIMELINE (2007) http://www.valmontbutte.com/timeline.html (last visited Mar. 27, 2008).
207. *Id.*
208. *Id.*
209. *Id.*

also told us more than I thought he would about the meaning of the Butte to local tribes, the kinds of ceremonies he conducts to keep things in balance, and the relationship he has to the local hawks that nest there. We stood there in the rain at the top of the Butte for some time, taking in the view in every direction, the way the Arapaho and Ute people must have. A high point on the edge of the plains is no small thing. I wonder if at least some of my students felt that there was something to this "sacred site" business, even if the sacred is marred by years of degradation.

What Valmont Butte has to do with climate change is this: In the American Indian worldview, the point of life is to take care of where you live. You are a part of nature and it is a part of you. Nature changes, becomes polluted and even contaminated. But it remains your obligation to care for it. Every measure towards this end matters on a daily basis. These are the attitudes that might keep us on target to mitigate climate change by reducing and eventually eliminating our greenhouse gas emissions. Understanding the depth and beauty in these attitudes might also nudge us towards enacting the full range of remedies necessary to address the disparate effects climate change is having on American Indian communities. Finally, these are the same attitudes that our children and grandchildren will need if our generation continues to fail to address climate change, and they are living in a world requiring skills, flexibility, and engagement of a kind that we can only barely imagine.