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CLIMATE CHANGE AND ITS EFFECT ON INDIGENOUS PEOPLES OF THE SOUTHWEST

*Josh Merrill**

Introduction

Climate change is no longer a topic relegated to the corners of science. The legal field has been forced to confront the phenomenon as the Supreme Court of the United States has recognized this issue in many recent cases. In one of the more widely discussed opinions concerning climate change, Justice Stevens wrote for the majority:

The harms associated with climate change are serious and well recognized. Indeed, the NRC Report itself—which EPA regards as an “objective and independent assessment of the relevant science,”—identifies a number of environmental changes that have already inflicted significant harms, including “the global retreat of mountain glaciers, reduction in snow-cover extent, the earlier spring melting of ice on rivers and lakes, [and] the accelerated rate of rise of sea levels during the 20th century relative to the past few thousand years”¹

Scientists have reached the conclusion that humans are dramatically impacting the environment. During the last few decades, the vast majority of these scientists have pointed to CO₂ emissions as the cause for this impact.² These changes have manifested in different ways, including rising temperatures, arctic sea ice retreat, permafrost melt, loss of glaciers and snowpack, changes in the water supply, and rising sea levels.³ There is a near consensus in the scientific community that many of these changes are irreversible (at least in the short-term), and the consequences society faces as a result are permanent.⁴ Climate change presents very real problems over

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1. *Massachusetts v. EPA*, 549 U.S. 497, 521 (2007) (alteration in original) (citations omitted).

2. See generally Lenny Bernstein et al., *Climate Change 2007: Synthesis Report*, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (Nov. 17, 2007), http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf [hereinafter *IPCC Synthesis Report*].

3. *Id.* at 30.

4. See Susan Solomon et al., *Irreversible Climate Change Due to Carbon Dioxide Emissions*, 106 PROC. OF THE NAT'L ACAD. OF SCI. 1704, 1705-07 (2009).

the next millennium for both the United States and the world as a whole. It is too late to take preventive measures to completely avoid climate change. However, we still can—and must—prepare for it.

The topic of climate change has come to the forefront of the political and national news scene over the past twenty years as new scientific data has emerged. This has caused the federal government, as well as many state governments, to somewhat reluctantly begin to address the problem. There must be broad, sweeping national policy changes that result in federal legislation to respond to an ever-increasing number of droughts and natural disasters wreaking havoc across the country.

Native Americans are one of the groups most heavily affected by climate change despite having what is likely one of the smallest environmental impacts.⁵ Many tribes have deep religious and spiritual connections with the land that they inhabit.⁶ In many cases, tribes' land and water interests have been allocated to them through treaties, federal legislation, and court decisions.⁷ Potential forces outside of tribes' control threaten their land and water resources. The federal government and the courts have an obligation to ensure that tribal cultures and natural resources are not threatened as a result of the imminent climate changes. There is a strong ethical argument that because of the history of relations between tribal governments and the United States, as well as Native Americans' minimal contribution to the problem, that the federal government should first ensure their well-being.⁸ With the federal deficit ever-increasing and the overall political climate of the country becoming exponentially more hostile, lawmakers must be made aware of the potential financial and social impact of the natural resource problems that Native American communities are facing.

This Comment discusses the climate change crisis facing the tribes as well as the appropriate responses needed from the United States government. The first part of this Comment will discuss the empirical evidence pertaining to climate change as well its far-reaching environmental consequences. The second part will focus on the direct threat climate change poses to Southwestern Native American tribes. This examination will include climate change's impact on the tribes' culture,

5. See Jonathan M. Hanna, *Native Communities and Climate Change: Protecting Tribal Resources as Part of National Climate Policy*, NAT. RESOURCES L. CTR. AT U. OF COLO. L. SCH., 1 (Sept. 19, 2007), https://adapt.nd.edu/resources/696/download/07_RR_Hanna.pdf.

6. *Id.*

7. *Id.*; see also *Winters v. United States*, 207 U.S. 564 (1908).

8. See Hanna, *supra* note 5, at 1.

natural resources, religion, and the resulting legal challenges presented. Third, this Comment will bring to light any steps the federal, state, and local governments have taken to address climate change in general, as well as specific steps take to reduce its impact on Southwestern Native American tribes. Fourth, the Comment will discuss recommendations for action on the part of Congress, the courts, and executive agencies. The strengths and weaknesses of each approach will be evaluated in order to select a superior option. Finally, the Comment will briefly discuss the tribes' best adaptation and mitigation options in response to climate change.

Climate change effects are being felt across the entire country.⁹ There is an imminent need to address the growing concerns that accompany such an inevitable, historical change.¹⁰ As with any national shift in policy, Native American tribes must play a role in the decision making process.¹¹ The federal government has an ethical obligation to ensure that the tribes are adequately provided for in any climate change legislation.¹² Keeping the channels of communication open for healthy dialogue will benefit both the United States and the tribal nations.

Climate Change and Its Consequences

Introduction

Climate change is a polarizing issue across the United States due to the politicization of the topic. One side either downplays its very presence by discrediting the science or instead ignores our responsibility to adapt and mitigate. The other views climate change as a real problem that requires real, overwhelmingly expensive solutions. Regardless, the reality is that climate change is here, and its consequences are here to stay.¹³ What that means and what actions should be taken may be up for debate, but the science points to the need for imminent, proactive measures.

Glaciers shrinking, ice sheets retreating, sea levels rising, and other biological changes are evidence that climate change is no longer something to discuss in terms of the future.¹⁴ These changes are happening now. The impact climate change has had on severe weather is debated.¹⁵ But there has

9. See *IPCC Synthesis Report*, *supra* note 2.

10. Solomon, *supra* note 4, at 1704.

11. See Hanna, *supra* note 5, at 1.

12. See *id.*

13. See Solomon, *supra* note 4, at 1704.

14. See *IPCC Synthesis Report*, *supra* note 2, at 31-33.

15. See *id.* at 52-53.

been a steady trend in heavier rainfall during wet seasons and more severe drought during dry seasons.¹⁶ According to studies conducted by prominent insurance companies, losses due to natural disasters such as hurricanes and tornadoes are also on the rise, but the cause of this increase is also debated.¹⁷ Some studies would suggest that climate change is the sole reason behind the increased losses, while others point toward economic and societal shifts.¹⁸ The explanation in those studies for the steady increase in losses is a shift in population centers where storms hit the hardest, as well as an overall increase in the wealth of those population centers.¹⁹

The leading authority on climate change is the Intergovernmental Panel on Climate Change (“IPCC”).²⁰ The United Nations General Assembly established the IPCC in 1988 in order to disburse a “clear scientific view on the current state of knowledge in climate change and its potential environmental and socio-economic impacts.”²¹ The IPCC is not responsible for conducting its own research or monitoring climate data, but rather, reviews and processes scientific information relating to climate change worldwide.²² The IPCC prides itself on a diverse, unbiased approach as it collects data from thousands of scientists all over the world.²³ These scientists represent a large range of different views and specializations. This process ensures an objective, accurate assessment of all available evidence.²⁴ Countries from across the world endorse the work and reports of the IPCC and regularly implement the scientific information in policy making.²⁵ The IPCC offers national governments a “unique opportunity” to gather balanced data from a neutral source and effectively use that information in policy making.²⁶ The IPCC released its fourth series of summaries in 2007 and plans to release the next series during 2014.²⁷

16. *Id.* at 49.

17. Laurens M. Bouwer, *Have Disaster Losses Increased Due to Anthropogenic Climate Change?*, 92 BULL. OF THE AM. METEOROLOGICAL SOC’Y 39, 40 (2011).

18. *Id.* at 41-42.

19. *Id.*

20. *Organization*, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, <http://www.ipcc.ch/organization/organization.shtml#UjjE2WajCrY> (last visited July 3, 2014).

21. *Id.*

22. *Id.*

23. *Id.*

24. *Id.*

25. *Id.*

26. *Id.*

27. *History*, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, http://www.ipcc.ch/organization/organization_history.shtml#UktMvShR90I (last visited July 3, 2014).

Observed Changes and Causes

Climate change is often referred to as “global warming,” due to lack of public knowledge of climate change and also because warming is the most prevalent evidence of climate change. The IPCC found that not only have global temperatures increased over the past hundred years, but they have also increased exponentially more rapidly over the past fifty years.²⁸ This warming coincides with a consistent rise in sea level and decrease in glaciers and ice caps.²⁹ Over the past fifty years, the globe has seen a surface temperature increase of .13⁰C per decade.³⁰ While considering these surface air temperatures, it is important to note that, according to the IPCC, over 80% of the warming is taking place in the oceans.³¹ Since observation began via satellite in 1978, data shows that Arctic Sea ice “has shrunk by 2.7% per decade.”³² Perhaps most alarming, is the increased “frequency and[] intensity” of extreme weather events.³³ The IPCC concluded that over the last fifty years, “[i]t is very likely [>90%] that cold days, cold nights and frosts have become less frequent over most land areas, while hot days and hot nights have become more frequent.”³⁴ Furthermore, “[i]t is [also] likely [>66%] that heat waves have become more frequent” as has “the frequency of heavy precipitation events.”³⁵ The evidence as to an increase in natural disasters such as hurricanes and tornadoes is inconclusive because there is too much regional variability as to frequency in these phenomena to conclusively state that climate change has impacted them at all.³⁶ However, as the IPCC Synthesis Report states, “Based on a range of models, it is *likely* that future tropical cyclones (typhoons and hurricanes) will become more intense, with larger peak wind speeds and more heavy precipitation associated with ongoing increases of tropical sea-surface temperatures.”³⁷

Perhaps the most startling IPCC conclusion is that much of anthropogenic climate change has been caused by greenhouse gas (“GHG”)

28. *IPCC Synthesis Report*, *supra* note 2, at 30.

29. *Id.*

30. *Id.*

31. *Id.*

32. *Id.*

33. *See id.*

34. *Id.*

35. *Id.*

36. *See Bouwer*, *supra* note 17, at 41-42.

37. *IPCC Synthesis Report*, *supra* note 2, at 46.

emissions.³⁸ “GHG emissions due to human activity have . . . increase[d] 70% between 1970 and 2004.”³⁹ “Carbon Dioxide [(“CO₂”)] is the most important [and prevalent] GHG.”⁴⁰ Due to human activities, atmospheric concentrations of GHGs since the beginning of the industrial era have far exceeded the natural range.⁴¹ The IPCC identifies industrial human activities as a driver of climate change, concluding with “*very high confidence* that the global average net effect of human activities since 1750 has been one of warming”⁴² The trend is even steeper over the last fifty years.⁴³ The increase in global temperatures is very likely due to an observed “increase in GHG concentrations.”⁴⁴ The warming has taken place over every continent with the exception of Antarctica.⁴⁵ However, human influence is not limited to average temperature alone. Scientific data points toward a discernible human impact on “temperature extremes and wind patterns.”⁴⁶

It is likely that this warming effect “influence[s] many natural systems” as well.⁴⁷ Even these relatively small changes in overall average temperature may have grave consequences on the biology of the earth.⁴⁸ Studies have concluded with high confidence that seasonal shifts due to climate change have led plants and animals alike to shift their seasonal habits.⁴⁹ “Observed trends include earlier frog breeding, bird nesting, first flowering . . . and [an earlier] arrival of migrant birds and butterflies,” just to name a few.⁵⁰ Other biological impacts include the total relocation of many species such as sea anemones and butterflies.⁵¹ Studies suggest that these biological shifts may point to an inevitable shift in regional climates

38. *See id.* at 36-41.

39. *Id.* at 36.

40. *Id.*

41. *Id.* at 37.

42. *Id.*

43. *Id.* at 39.

44. *Id.*

45. *Id.*

46. *Id.* at 40.

47. *Id.* at 40; see also Camille Parmesan & Gary Yohe, A Globally Coherent Fingerprint of Climate Change Impacts Across Natural Systems, 421 NATURE 37, 37 (Jan. 2, 2003).

48. *See* Parmesan & Yohe, *supra* note 47.

49. *See id.* at 38.

50. *Id.*

51. *Id.* at 39.

of the United States, but some people question whether there have been enough studies performed to verify this.⁵²

The Future and Potential Consequences

Projecting climate change and continued warming into the future is a complex and difficult process. The research, formulas, and computer projections all contain fairly unpredictable variables.⁵³ Each projection is different from the next. However, what scientists do agree on is that climate change is going to continue in the future, likely at a higher rate than we have previously seen.⁵⁴ Credible studies suggest that climate change is irreversible, at least for the near future (1,000 years).⁵⁵ GHGs will stay in the atmosphere and remain at consistent levels far beyond when emissions cease.⁵⁶ Just as the intensity of climate change has rapidly increased over the last several decades, it is expected to do the same over the near future.⁵⁷ Stopping all industrial activity tomorrow could not change this fact.⁵⁸ As a result, legislatures and courts alike must work to adapt to the changing climate. Given that the United States and similar industrialized nations contribute to the GHG problem the most, the U.S. government has an ethical responsibility to ensure that the groups that contribute to the problem the least are provided for.⁵⁹ This paper will discuss some of the legislative and judicial options to protect Southwest Native American tribes from the devastating effects of climate change.

The Impact on Southwestern Native American Tribes

Introduction

The Southwest “is home to over 70 federally recognized Native American tribes”⁶⁰ The climate in the Southwest is extremely diverse.⁶¹ For research purposes, the Environmental Protection Agency

52. See *IPCC Synthesis Report*, *supra* note 2, at 52.

53. See Hanna, *supra* note 5, at 4.

54. See *IPCC Synthesis Report*, *supra* note 2, at 45.

55. Solomon, *supra* note 4, at 1704.

56. *Id.*

57. See *id.* at 1706.

58. See *id.* at 1704.

59. Hanna, *supra* note 5, at 1.

60. *Id.* at 18.

61. *Climate Change Impacts & Adaptation in the Southwest*, U.S. ENVTL. PROT. AGENCY, <http://www.epa.gov/climatechange/impacts-adaptation/southwest.html> (last visited July 3, 2014) [hereinafter *Climate Change Impacts*].

(“EPA”) has classified the Southwest region as stretching from the western Great Plains through Colorado, Arizona, and New Mexico and into Southern California.⁶² This variability allows a broad study of climate change within a specific region. The availability of water is the biggest concern related to climate change facing the tribes in the Southwest.⁶³ Water in the Southwest is a problem because the seasonal shifts are so great that there can be a surplus one season followed by a severe drought and shortage just a month later.⁶⁴ Compounding the problem is the fact that the region continues to grow as population centers expand.⁶⁵ Several states in the region saw their population increase “double the national average.”⁶⁶ This growth places a stronger demand, and thus a premium, on the water supplies of the region. These same water supplies show signs of decreasing, not because of demand but because of climate change. Combine these factors, and the southwestern tribes face an uphill battle to not only retain their water rights but to pursue their need for more.

Climate Change and the Water

The Colorado River Basin provides water for much of the Southwest, including up to seven states.⁶⁷ Unfortunately, climate change is having a dramatic effect on this river system. The Colorado River Basin is fed primarily by runoff from the snowpack in the mountains.⁶⁸ Snowpack has been one of the victims of the warming trend that climate change has produced.⁶⁹ This means that the flow through the river system is ultimately taking a hit as a result of the reduction of snowpack. Given the large number of people relying on this source of surface water for their daily needs, climate change greatly impacts this region.

The reduced stream flow presents not only quantity problems, but also quality problems.⁷⁰ Any decrease in stream flow threatens water quality.⁷¹

62. *Id.*

63. Hanna, *supra* note 5, at 19.

64. *Id.*

65. *Climate Change Impacts*, *supra* note 61.

66. *Id.*

67. Hanna, *supra* note 5, at 19.

68. *Id.*; Niklas S. Christensen et al., *The Effects of Climate Change on the Hydrology and Water Resources of the Colorado River Basin*, 62 *CLIMATE CHANGE* 337, 338 (2004).

69. *See IPCC Synthesis Report*, *supra* note 2, at 30.

70. *See* Hanna, *supra* note 5, at 20.

71. *See id.*

Water borne diseases are projected to rise.⁷² Another impact on water quality relates to oxygen content because

[a]s water warms, it holds less oxygen, putting stress on coldwater fish such as trout. Rivers and streams in Western Colorado approached the low 70s many days [in the summer of 2012]—almost 20 degrees above normal—prompting rangers to ask that anglers voluntarily suspend[] fishing in some areas.⁷³

If estimates of stream flow decrease prove to be too conservative then there is potential for serious health problems for all wildlife that depend on the river.⁷⁴ Fish health is of the utmost concern to the tribes in particular as many of them still depend on the river basin as both a water and food source.⁷⁵ The river's ability to sanitize itself and maintain normal oxygen levels will ultimately be threatened by reduction in stream flow.⁷⁶ If one level of an ecosystem is impacted, all will suffer.

Tribal Water Problem

Water is the source of all life. This phrase is dangerously true for the southwestern tribes. These tribes are closely tied to “their reservation land and resources.”⁷⁷ One can imagine the agricultural impact that a water problem would have for a culture that has traditionally relied on growing crops, raising livestock, and drawing natural resources from the water.⁷⁸ The national agricultural industry is already struggling in the weak economy.⁷⁹ The situation is no different for the tribes of the Southwest. Many tribes, particularly in Arizona, rely heavily on their agricultural production in order to produce income.⁸⁰ Recent government estimates place a quarter (25.3%) of the Native American population below the

72. *IPCC Synthesis Report*, *supra* note 2, at 53.

73. Jennifer Oldham, *Drought Curbs Tourism as Boat Docks Stand on Dry Ground in Texas*, BLOOMBERG (Aug. 6, 2012, 9:01 PM), <http://www.bloomberg.com/news/2012-08-07/drought-curbs-tourism-as-boat-docks-stand-on-dry-ground-in-texas.html>.

74. *See* Hanna, *supra* note 5, at 20.

75. *See id.* at 20-21.

76. *Id.* at 20.

77. *Id.*

78. *Id.*

79. *See U.S. Farmers See Their Income Plunge 38% As Recession Grips Agriculture*, HUFFINGTON POST (May 25, 2011, 2:55 PM), http://www.huffingtonpost.com/2009/08/28/us-farmers-see-their-inco_n_271019.html.

80. Hanna, *supra* note 5, at 20-21.

poverty line.⁸¹ Part of the reason for this poverty is the tribal way of life, which is primarily agricultural for tribes in the Southwest. Specifically, Arizona-based tribes rely heavily on the Colorado River to cultivate their primary crops of cotton, wheat, and alfalfa.⁸²

Predictably, the dryer climate conditions will have a dramatic impact on the tribes' agriculture-based industry.⁸³ As discussed, the IPCC predicts that dry seasons will get dryer while wet seasons will see more moisture.⁸⁴ These extremes do not bode well for the southwestern tribes. Prolonged drought more readily subjects crops to disease and pests.⁸⁵ The Southwest has seen an outbreak of wild fires over the past several years that are directly attributable to drought. While these droughts cannot be ascribed directly to climate change, there is a trend. As climate change continues to manifest, the IPCC suggests that these droughts will become more and more prevalent.⁸⁶ If this is in fact the case, many tribes will see their source of revenue turn into nothing more than a match waiting to ignite.

The agricultural problems necessitated a shift to other revenue producing activities.⁸⁷ These activities are non-traditional for the tribes but have proven effective. However, these too will be impacted by climate change.⁸⁸ The leading option that tribes have turned to is a water-based tourism industry.⁸⁹ The water-based tourism industry includes rafting, boating, fishing, and water-skiing.⁹⁰ This industry has developed around the Colorado River and the various lakes throughout the tribal territory.⁹¹ Needless to say, a dryer climate will have a negative impact on aquatic recreation. The extremes of a dry season take a toll on the free flow of a river as well as the volume of a lake.⁹² Drought significantly cuts the total number of days in which boating, water-skiing, or rafting are viable.⁹³ This

81. Tom Rodgers, *Native American Poverty*, SPOTLIGHT ON POVERTY AND OPPORTUNITY, <http://www.spotlightonpoverty.org/ExclusiveCommentary.aspx?id=0fe5c04e-fdbf-4718-980c-0373ba823da7> (last visited July 3, 2014).

82. Hanna, *supra* note 5, at 20.

83. *Id.* at 20-21.

84. *IPCC Synthesis Report*, *supra* note 2, at 46.

85. Hanna, *supra* note 5, at 21.

86. *See IPCC Synthesis Report*, *supra* note 2, at 30.

87. Hanna, *supra* note 5, at 21.

88. *See id.*

89. *Id.*

90. *Id.*

91. *See id.*

92. Oldham, *supra* note 73.

93. *Id.*

impact is most evident in Colorado where whitewater rafting is a \$155 million industry.⁹⁴ Many river tributaries that rely on water from snowmelt are running dry. Snowmelt water in the summer of 2012 was measured at just 2% of its normal average.⁹⁵ Some rafting companies have been forced to reduce their offerings by up to one-half.⁹⁶ Every day missed during a peak season (summer) is revenue lost by the tribe. The dryness of a season often results in state-wide burn bans instituted in order to avoid wild fires like that one that shut down Manitou Springs, an area sacred to Native Americans, during the summer of 2012.⁹⁷

“[T]he increases in summer temperature and decreases in summer humidity” are expected to continue, resulting in “substantial increase in fire danger over much of the West.”⁹⁸ Unfortunately, the regions already most widely affected by wild fires—“the northern Rockies, Great Basin, and Southwest”—will bear the brunt of the increased fire risk.⁹⁹ Scientific estimates project that “the length of the fire season could be increased by two to three weeks” by the year 2070.¹⁰⁰ These wild fires are not only devastating for tribes’ natural resources but also for any revenue producing facilities that have been constructed. Needless to say, it can take years for a region to recover from a large wild fire.

Not only do the wild fires present a pressing problem, but also the burn bans themselves can cost tribes revenue. Offering camping areas in conjunction with aquatic activities has been a profitable venture for many tribes.¹⁰¹ With burn bans in effect, the traditional campfire or grill are not available to potential tourists. Tourists are not only deterred by the lack of these activities, but also shy away because of the fire danger itself. Every day a burn ban is in effect, the tribe loses potential tourism revenue.

The numerous present cases of severe drought and warm temperatures, along with their destructive consequences are small examples of the large-scale climate shift. It is important to note that present, temporary conditions alone do very little to prove climate change as a whole. One cold summer or warm winter does nothing to substantiate or discount climate change.

94. *Id.*

95. *Id.*

96. *Id.*

97. *See id.*

98. Tim Barnett et al., *The Effects of Climate Change On Water Resources in the West: Introduction and Overview*, 62 CLIMATIC CHANGE 1, 7 (2004).

99. *Id.*

100. *Id.*

101. *See* Hanna, *supra* note 5, at 21.

However, as discussed above, studies show that these relatively “short” droughts and periods of warmer temperatures are becoming much more frequent. The challenges the tribes are facing proves that the shifting climate is affecting real people and their way of life on a daily basis. By implementing mitigating and adaptive measures that confront the root causes and effects of climate change, the law can do much to ensure that the troubles facing the tribes of the Southwest are short term consequences of years of ignoring the greenhouse gas problem, rather than a glimpse into the long term future.

As previously discussed, climate change is here, and it is already impacting southwestern tribes and reservations. The arid, dry climate of the Southwest is exaggerated by the shifting climate. Drought will likely become increasingly common.¹⁰² Drought, accompanied by the decreasing water supply and fight for water rights, is already depleting tribal assets.¹⁰³ The Navajo Reservation, located near Aztec, New Mexico, has the misfortune of being a perfect example of the impact climate change is having on tribes. There, “neighbors [spent the summer of 2012] battling neighbors and livestock for water,” as the Nation experienced its “worst drought in half a century.”¹⁰⁴ Horses were left abandoned as families were forced to choose between feeding themselves or their livestock.¹⁰⁵ This drought affected “87 percent of . . . land dedicated to growing corn, 63 percent of . . . land [used] for hay, and 72 percent of the land used for cattle” in thirty-three states.¹⁰⁶

The increasing frequency of drought has hit the Southwest harder than any other region in the country.¹⁰⁷ In the summer of 2012, hot temperatures and negligible rain scorched the entire country, “prompting 26 . . . states to declare a drought emergency.”¹⁰⁸ Two of the states hit the hardest were Arizona and New Mexico.¹⁰⁹ The Rio Grande headwaters suffered from

102. See *IPCC Synthesis Report*, *supra* note 2, at 49.

103. See Fernanda Santos, *Horses Fall Victim to Hard Times and Dry Times on the Range*, N.Y. TIMES, Aug. 18, 2012, <http://www.nytimes.com/2012/08/19/us/horses-fall-victim-to-hard-times-and-dry-times-on-the-range.html>.

104. *Id.*

105. *Id.*

106. *Id.*

107. See Zack Guido, *Droughts, Megadroughts, and More: A Conversation with Jonathan Overpeck*, SOUTHWEST CLIMATE CHANGE NETWORK, <http://www.southwestclimatechange.org/feature-article/drought-interview> (last visited July 3, 2014).

108. *Id.*

109. *Id.*

dwindling irrigation from the Elephant Butte Reservoir as a result.¹¹⁰ This reservoir “supports more than 90,000 acres of farmland” near the Mescalero Apache Reservation.¹¹¹ As a result of the severe drought and temperature shift, many farmers in New Mexico “face reduced crop yields” while their production costs rise.¹¹² This not only has a direct impact on the reservation inhabitants in New Mexico, but also on the entire state’s economy and the nation’s agricultural industry.¹¹³

The Southwest has never enjoyed a tropical climate and is well known for experiencing periods of drought and intense heat. In fact, studies of “tree rings reveal” a long history of drought; however, “the current dry conditions stand out from the history[y]” of the Southwest.¹¹⁴ Though the summer of 2012’s drought was excruciating, scientists expect future dry spells to be worse.¹¹⁵

Climate change presents concerns beyond just water shortages and decreasing agricultural production. One of those concerns is human health.¹¹⁶ “Warming temperatures will likely make it more difficult for the Southwest’s rapidly growing cities to meet air quality standards.”¹¹⁷ California is the most extreme example of climate change posing a direct risk to human health, with “more than 90% of California’s population liv[ing] in areas that violate state air quality standards for ground-level ozone or small particles”¹¹⁸ Warmer temperatures support the formation and gathering of air pollution.¹¹⁹ Reservations in the Southwest, largely innocent of this type of pollution build-up, will continue to pay the price of climate change.¹²⁰ Though it will take some time for climate change to cause serious and consistent air quality issues outside heavy population centers, it is certainly headed that direction.

In California alone, “air pollutants caus[e] an estimated 8,800 deaths and over \$1 billion in health care costs every year.”¹²¹ Low air quality conditions primarily “threaten the health and well-being of people who

110. *Id.*

111. *Id.*

112. *Id.*

113. *See id.*

114. *Id.*

115. *See id.*

116. *Climate Change Impacts, supra* note 61.

117. *Id.*

118. *Id.*

119. *Id.*

120. *See id.*

121. *Id.*

suffer from respiratory ailments, such as asthma and chronic obstructive pulmonary disease.”¹²² However, health science has now linked high concentrations of air pollution to health problems for even those without pre-existing conditions.¹²³ Perhaps most frightening, recent studies have tied air pollution to lung cancer. “[A]bout one in 10 people who develop lung cancer have never smoked.”¹²⁴ One such study, conducted by Michelle Turner of the University of Ottawa, concluded that “for every 10 extra units of air pollution exposure, a person’s risk of lung cancer rose by 15 to 27 percent.”¹²⁵ Francine Laden, a professor at the Harvard School of Public Health, said that the emerging link between air pollution and lung cancer is “another argument for why the regulatory levels (for air pollutants) [should] be as low as possible.”¹²⁶ It is quickly becoming apparent to those in California that complying with air pollutant regulatory standards is increasingly difficult as the climate continues to change and temperatures warm.

Climate change also poses significant threats to the power grid.¹²⁷ The electric power grid in much of the Southwest is closely tied to the steady and consistent availability of water due to the utilization of hydroelectric power plants.¹²⁸ Many tribes derive their power from hydroelectric dams.¹²⁹ As discussed at length above, increasing temperatures and aridity in the Southwest are expected to threaten the reliability of water supplies. This will, in turn, affect the availability of electricity for the region.¹³⁰ Increased demand for power through the use of air conditioning during the driest and warmest periods will only escalate the problem, as these are the times that the electric grid may be experiencing its largest shortages.¹³¹ “These

122. *Id.*

123. Kerry Grens, *Air Pollution Tied to Lung Cancer in Non-Smokers*, REUTERS (Oct. 28, 2011, 4:19 PM), <http://www.reuters.com/article/2011/10/28/us-air-pollution-idUSTRE79R5NM20111028>.

124. *Id.*

125. *Id.*

126. *Id.*

127. *See Climate Change Impacts*, *supra* note 61.

128. *See id.*

129. *See Division of Irrigation, Power and Safety of Dams*, U.S. DEP’T OF THE INTERIOR BUREAU OF INDIAN AFF., <http://www.bia.gov/WhoWeAre/BIA/OTS/IPSOD/index.htm> (last visited July 3, 2014).

130. *See Climate Change Impacts*, *supra* note 61.

131. *See id.*

impacts are expected to be compounded by the region's rapid population growth."¹³²

The decrease in the availability of water throughout the Colorado River Basin concerns those who not only rely on the river as a source of water and food, but for power as well.¹³³ Most of the region, including many Native American tribes and reservation inhabitants, rely on the Colorado River Basin for at least one of the three. "[U]sers of Colorado River hydroelectric power will be affected by lower reservoir levels and flows, which [studies suggest could] result in reductions in hydropower generation by as much as 40%."¹³⁴ Researchers from each of the Scripps Institution of Oceanography, Los Alamos National Laboratory, Pacific Northwest National Laboratory, Naval Postgraduate School, and the National Center for Atmospheric Research conducted the study.¹³⁵ The group summarized their findings, saying, "[W]e found the fully allocated Colorado system to be at the brink of failure, wherein virtually any reduction in precipitation over the Basin, either natural or anthropogenic, will lead to the failure to meet mandated allocations."¹³⁶

If, as expected, climate change continues to negatively impact water supplies, any appropriation provided to the tribes by the United States government will inevitably be inadequate. As the water supply decreases, the government will be forced to give to reservations an exponentially larger percentage of the rights in the rivers and basins. The percentages will eventually become so large that they are unsustainable, as the general population outside of the reservations will experience major shortages. This crossroads, while theoretical and still in the future, will force the government to choose between honoring their commitments and contracts with the American Indian population and providing for the average citizen. This Comment will later examine the dilemma that the government is facing and several viable alternatives that will provide for the continued prosperity of the reservations without leaving disadvantaging the general population.

132. *See id.*

133. Barnett et al., *supra* note 98, at 6-7.

134. *Id.*

135. *Id.* at 1.

136. *Id.* at 7.

*Legislative, Judicial, and Executive Action**Introduction*

In order to have meaningful commentary on climate change and its impact on western and southwestern tribes, a discussion of the legal framework for water rights is necessary. That discussion must begin where water allocation in the West began, with the doctrine of “Prior Appropriation.” This doctrine has governed water allocation in the western United States for over a century.¹³⁷ The basis of the Prior Appropriation Doctrine is that a person who puts water to a “beneficial use” acquires the “right to use enough water to serve that purpose.”¹³⁸ The earliest users avail themselves of the strongest rights.¹³⁹ As the western states experienced a population boom in the early twentieth century, water was quickly “fully appropriated,” and thus new uses for water were extremely limited due to possessing only junior rights.¹⁴⁰ The mandatory authority of Prior Appropriation has wilted away with pressures from federal law requirements, tribal demands, environmental considerations, and state judicial decisions.¹⁴¹ Despite the move away from the doctrine, Prior Appropriation remains an underlying theme in the development of modern, western water law.¹⁴² The obvious problems with this outdated doctrine as well as solutions to these challenges will be discussed below.

The federal government began to shape tribal water rights in 1908 when the Supreme Court decided *Winters v. United States*.¹⁴³ The Supreme Court specified exactly which implied water rights accompanied the expressed right of the tribes to occupy the land.¹⁴⁴ A proper understanding of the *Winters* case and its far reaching implications is essential to any discussion of climate change and its effect on tribal water rights.

137. See Norman K. Johnson & Charles T. DuMars, *A Survey of the Evolution of Western Water Law in Response to Changing Economic and Public Interest Demands*, 29 NAT. RESOURCES J. 347, 349 (1989).

138. Reed D. Benson, *Alive but Irrelevant: The Prior Appropriation Doctrine in Today's Western Water Law*, 83 U. COLO. L. REV. 675, 676 (2012).

139. *Id.* at 677 (“‘Senior’ rights take priority over ‘junior’ ones . . . when water supplies are insufficient to satisfy all users.”).

140. *Id.*

141. See *id.* at 677-78.

142. See *id.* at 678-79.

143. 207 U.S. 564 (1908).

144. See *id.*

The Water: Winters v. United States

“Water rights . . . are held ‘in common for the public good.’”¹⁴⁵ Water itself cannot be owned by individuals; rather, there is a right to use water.¹⁴⁶ The *Winters* decision was a landmark case for tribal water rights. The opinion, written by Justice McKenna, is the basis and foundation of modern Indian water law.¹⁴⁷ The case resolved claims by the Indians on the Fort Belknap reservation to the waters of the Milk River in Montana.¹⁴⁸ The reservation was comprised primarily of land suitable for ranching and agricultural activities for which the Milk River was essential.¹⁴⁹ The defendants built dams upstream from the Fort Belknap reservation and thus diverted water away from the reservation.¹⁵⁰ The Native American plaintiffs sued to enjoin the defendants from further construction and operation of the dams as the reservation’s reservoir had been severely affected.¹⁵¹ The defendants argued that while the federal government had set aside land for the Fort Belknap reservation, no such overture was made for the water rights to the Milk River.¹⁵² This would leave the defendants to use the water located upstream as they saw fit regardless of its necessary effect on the reservation.¹⁵³

The Justices found the argument advanced by the defendants unpersuasive. The Court ultimately decided the idea that the Indians accepted a small plot of land with the stated intentions of agriculture and grazing, yet knowingly relinquished the right to the very resource that makes these activities viable, was preposterous.¹⁵⁴ Justice McKenna summarized the Court’s position:

The power of the government to reserve the waters and exempt them from appropriation under the state laws is not denied, and could not be. That the government did reserve them we have decided, and for a use which would be necessarily continued through years. This was done May 1, 1888, and it would be

145. Amy Choyce Allison, *Extending Winters to Water Quality: Allowing Groundwater for Hatcheries*, 77 WASH. L. REV. 1193, 1195 (2002).

146. *Id.*

147. *See Winters*, 207 U.S. 564.

148. *Id.* at 565.

149. *Id.* at 566.

150. *Id.* at 565.

151. *Id.*

152. *See id.* at 567.

153. *Id.* at 567-68.

154. *See id.* at 576.

extreme to believe that within a year Congress destroyed the reservation and took from the Indians the consideration of their grant, leaving them a barren waste—took from them the means of continuing their old habits, yet did not leave them the power to change to new ones.¹⁵⁵

In laying the groundwork for all future water law, the Court found that there was an implied reservation of water rights to the Milk River, despite the lack of such an expressed declaration.¹⁵⁶

Winters essentially worked to invalidate the Prior Appropriation Doctrine as it pertains to Indian reservations. Thus, it was unnecessary for the tribe to have put the water to a “beneficial use” in order to have senior rights in it; the reservation merely must have been established.¹⁵⁷ Without this rule, tribes’ use of water would be extremely limited. According to the Court in *Winters*, the establishment of the reservation by the federal government also reserves the waters and thus exempts them from appropriation.¹⁵⁸ The *Winters* Court recognized that “state law generally governs water rights,” but established that “federally reserved water rights,” whether expressed or implied, “are not subject to state law.”¹⁵⁹

There is precedent to suggest that any water resources available on a reservation beyond the quantity necessary to fulfill the tribe’s federal reserved rights are deemed “excess” waters and are available for anyone to appropriate under state law. These excess waters are subject to state regulation.¹⁶⁰ This situation arises when the tribe is not currently consuming all of the water to which it has legal rights. An issue that has yet to be determined is what happens when the tribe tries to assert its right in the water after it is already being put to other public or private use. Commentators often refer to the tribal rights created in *Winters* as the “Winters rights.”¹⁶¹ The rights are comprised of three recognized principles: (1) the rights “may be asserted at any time;” (2) they “do not require continued beneficial use,” unlike the Prior Appropriation Doctrine; and (3) the tribes’ seniority “take[s] priority over . . . junior . . . users.”¹⁶² These

155. *Id.* at 577 (citations omitted).

156. *Id.*

157. *See* Benson, *supra* note 138, at 676-77 (discussing the concept of beneficial use within the context of the Prior Appropriation Doctrine).

158. *See Winters*, 207 U.S. at 577.

159. *See* Allison, *supra* note 145, at 1202.

160. *See* United States v. Anderson, 736 F. 2d 1358 (9th Cir. 1984).

161. Allison, *supra* note 145, at 1203.

162. *Id.*

rights work to ensure that there is adequate water “to fulfill the [needs] of the reservation.”¹⁶³

The limits of the *Winters* doctrine quickly became apparent during litigation. Reservations are only allotted enough water to fulfill the specific purpose of that reservation.¹⁶⁴ The tribes are not given free rein to use the decision in *Winters* to acquire unlimited water rights.¹⁶⁵ Part of the *Winters* Court’s reasoning in awarding implied water rights to reservations was that the Indians desired reservations to carry out very specific purposes to which water was essential.¹⁶⁶ Therefore, the quantity allowed to the reservations is limited to that necessary to fulfill these activities.¹⁶⁷ The reservations are not to use the water rights strictly as a revenue-producing tool. The tribes may be able to transfer their water rights for non-tribal use and this can be a helpful revenue tool, but, in doing so, the tribes must navigate many obstacles.¹⁶⁸ If the tribes wish to transfer their allotted water to a third party then they are free to do so. This typically comes at a steep price, as the original activity for which the water was claimed is sacrificed.

While *Winters* lays out a bright-line federal rule, the water “in excess of the right” granted by this doctrine “is subject to state water law.”¹⁶⁹ Far from following a bright-line rule, state courts are charged with the “task of determining the purpose of the reservation” in order to quantify its need for water.¹⁷⁰ This complicated process leaves plenty of room for the type of grey area and controversy that courts prefer to avoid. The judge’s determination can significantly impact a tribe’s future. For example, some courts narrowly interpret the purpose of Indian reservations, and thus only allot enough water for agriculture, while others allow for several different purposes, thus providing an abundance of water to the tribe.¹⁷¹ Still, very few courts have adopted the broadest interpretation of a reservation’s

163. *Id.*

164. *Id.* at 1206.

165. *See id.*

166. *See id.* at 1201-02.

167. *Id.* at 1206.

168. *See In re Rights to Use Water in Big Horn River*, 753 P. 2d 76 (Wyo. 1988).

169. Allison, *supra* note 145, at 1206.

170. *Id.*

171. *Id.* at 1206-07 (comparing *In re Gen. Adjudication of All Rights to Use Water in the Big Horn River Sys.*, 753 P.2d 76, 86 (Wyo. 1988), *aff’d sub nom.* Wyoming v. United States, 492 U.S. 406 (1989), and *abrogated by* Vaughn v. State, 962 P.2d 149 (Wyo. 1998), with *United States v. Adair*, 723 F.2d 1394, 1409 (9th Cir. 1956)).

purpose as being “to create a permanent homeland” for the tribe.¹⁷² This approach allows for “a wide array of water use on reservations and reserves water for uses that were not necessarily contemplated at the time of the creation of the reservation.”¹⁷³

Many political and socioeconomic factors contribute to these decisions by the judiciary. The courts that allow only for an agricultural purpose tend to be more conservative and may take a “textualist” approach to the acts of Congress that established the respective reservations. They believe that while reservations often serve many useful and revenue producing purposes, that the original intent of the people creating the reservation should be preserved. Many of these reservations are over one hundred years old and, as such, were founded almost exclusively for agricultural purposes. These conservative courts take the position that the reservations should remain solely for that activity. The more progressive view has allowed the reservations to evolve with the passage of time.¹⁷⁴ These courts broadly interpret the modern-day purpose of the reservation and allow the tribes to use the land and accompanying water rights as they please.¹⁷⁵ This view is both more practical and beneficial for the Indians occupying the reservation and seeking to derive an income from the land.

After taking the necessary steps to “determine purpose of a reservation,” the court then must find a way to objectively quantify the necessary water rights to fulfill that specific purpose.¹⁷⁶ This often becomes a point of contention between the state and court seeking to make the determination. While the *Winters* decision establishes a basic boundary, all specific determinations for allocation for respective uses are left to the state.¹⁷⁷ This was clearly not the intent of the Supreme Court when handing down the *Winters* decision. The Court laid out its first and only exact quantification of reservation water rights in *Arizona v. California*.¹⁷⁸ Predictably, the state argued for a flexible standard that allotted the reservation water based on its “reasonably foreseeable needs.”¹⁷⁹ The Court found this argument

172. Allison, *supra* note 145, at 1207 (citing *Adair*, 723 F.2d at 1410 and *Colville Confederated Tribes v. Walton*, 647 F.2d 42, 47-48 (9th Cir. 1981)).

173. *Id.*

174. *See id.*

175. *See id.*

176. *Id.*

177. *See id.*

178. 373 U.S. 546, 600-01 (1963), *judgment entered*, 376 U.S. 340 (1964), *amended*, 383 U.S. 268 (1966), and *amended*, 466 U.S. 144 (1984).

179. Allison, *supra* note 145, at 1208.

unpersuasive and decided that it left too much to interpretation.¹⁸⁰ This standard would induce substantial litigation in almost every single water reservation rights case because parties would fight about exactly what is reasonable. The Court settled on the Practicably Irrigable Acreage (“PIA”) standard in order to quantify water rights for reservations with strictly agricultural purposes.¹⁸¹ This analysis considers “factors such as soil, slope, drainage, and economic feasibility” to allow tribes enough water to irrigate all of the acres on the reservation.¹⁸² This is still the only case in which the United States Supreme Court quantified a specific reservation’s water rights, but the point was made: the Court intends to be generous with regard to quantifying implied water rights for the reservations.¹⁸³

Some time after the *Arizona v. California* decision, the Supreme Court of Arizona took a shot at the PIA standard by holding that it was not appropriate for all reservations, as many tribes owned land not conducive to agriculture.¹⁸⁴ *In re General Adjudication of All Rights To Use Water in the Gila River System and Source*,¹⁸⁵ lays out a less-clear, “multifaceted approach” that was to be used when the reservation had a purpose besides pure agriculture.¹⁸⁶ While each of these decisions play an important role in determining water rights for Indian reservations, *Winters* laid the foundation. These cases and the need for new legislation, as well as judicial action, will need to be examined and altered in the context of our shifting climate. These decisions provide a solid bargaining chip for the reservations to rely on going forward as they are forced to address the inevitable resource problems that accompany climate change.

Adaptive Measures

The EPA has adopted a clear climate change adaptation strategy. The pervasive approach is to work with tribal, local, and state governments to implement various plans to adapt and prepare for the effects of climate change.¹⁸⁷ Because of the diverse climate of the Southwest region, the EPA

180. *Id.*

181. *Id.* at 1207-08.

182. *Id.* at 1208.

183. See Jennele Morris O’Hair, *The Federal Reserved Rights Doctrine and Practicably Irrigable Acreage: Past, Present, and Future*, 10 *BYU J. PUB. L.* 263, 273 (1996).

184. Allison, *supra* note 145, at 1208.

185. 35 P.3d 68 (Ariz. 2001).

186. Allison, *supra* note 145, at 1208.

187. *National Water Program 2012 Strategy: Response to Climate Change*, U.S. ENVTL. PROT. AGENCY, 5 (Mar. 2012), http://water.epa.gov/scitech/climatechange/upload/NWP_Draft_Strategy_03-27-2012.pdf [hereinafter *National Water Program*].

is working alongside these entities to enact very climate-specific strategies.¹⁸⁸ Some of the EPA's stated strategies include:

Encourage funding programs to fund green infrastructure, energy and water-efficient upgrades to infrastructure, and water conservation; [w]ork through the California Water and Energy Project (an interagency partnership) as well as the California Financing Coordinating Committee, to leverage funding to support sustainable water infrastructure and water use efficiency projects; [c]ontinue to provide funding for tribal sustainable water infrastructure projects in coordination with the Indian Health Services; and [b]uild partners' and stakeholders' understanding of, and the capacity to respond to, risks of climate change and water.¹⁸⁹

One example of the EPA's cooperation with Native American tribes in the Southwest is the agency's work with the Hualapai Reservation.¹⁹⁰ The Hualapai Reservation is located in northwestern Arizona. In 2006, the EPA partnered with the Hualapai Department of Natural Resources to implement a plan to deal with "the climate change impacts that will likely affect the Hualapai people."¹⁹¹ Like most tribes in the region, the Hualapai "is most concerned with temperature increases and precipitation decreases that would reduce the availability of water"¹⁹² Water is "a resource that is important to the tribe's economy,"¹⁹³ as the primary sources of income on the reservation include tourism and cattle ranching.¹⁹⁴ The tourism industry is based on water rafting, hunting, and fishing.¹⁹⁵ Given the absolute necessity of water for the sustainability of the reservation, the tribe wisely enlisted the EPA's help in adaptation planning. "The Hualapai Tribe has taken several steps to help ensure" that an adequate amount of freshwater will be available even in times of drought and warmer temperatures.¹⁹⁶ "[T]he tribe constructed water catchments to store water on the

188. *See id.* at 70.

189. *Id.* at 70-71.

190. *See Adaptation Examples in the Southwest*, U.S. ENVTL. PROT. AGENCY, <http://www.epa.gov/climatechange/impacts-adaptation/southwest-adaptation.html#adapthualapai> (last visited July 5, 2014) [hereinafter *Adaptation Examples*].

191. *Id.*

192. *Id.*

193. *Id.*

194. *About Hualapai*, HUALAPAI TRIBE, <http://hualapai-nsn.gov/about-2/> (last visited July 3, 2014).

195. *Id.*

196. *Adaptation Examples*, *supra* note 190.

Reservation, removed non-native tamarisk plants that are believed to disrupt the ecosystem, and built new wells and water pipelines.”¹⁹⁷

California has been the most aggressive state in implementing climate change policies. The state published the “2009 Climate Adaptation Strategy,” which was the most comprehensive plan of its kind.¹⁹⁸ Within the 200-page document, the government laid out a ten-step plan for coping with the imminent water problem.¹⁹⁹ The plan included goals to: provide “sustainable funding” for statewide water management, “aggressively increase water use efficiency,” “enhance and sustain ecosystems” in the face of climate change, expand water storage, “provid[e] a more reliable water supply [by] enhancing the Delta ecosystem,” upgrade and increase monitoring in order to project the future water supply, project and prepare for “sea-level rise,” and continue to fund research and analysis to explore “California’s vulnerability to climate change” and the adaptation needed to remedy shortcomings.²⁰⁰ While a detailed analysis of California’s plan is beyond the scope of this paper, the adaptation strategy is important because the state’s plan will do much to shield the Native American tribes within its borders from the harmful effects of climate change. The tribal governments are ultimately responsible for the maintenance and conservation of the resources within their borders. However, a comprehensive policy by the state will lessen the strain on tribal resources such as water because the surrounding resources will be properly managed.

Adaptive-type measures are much more difficult to implement from a federal perspective than are preventative measures. Adaptive measures typically require state, local, and regional action and cooperation, whereas mitigating action may only require a judicial ruling, a piece of legislation, or executive regulation, with which industries are then forced to comply. Though the federal government is required to expend resources in the enforcement of those mitigating laws, the path to directly impacting policy is much simpler than the path to enacting an adaptive strategy.

Preventative and Mitigating Measures

The Environmental Protection Agency’s expanding role in the regulation and preservation of America’s environment (and subsequently climate) is sometimes overstated; however, the Agency has seen some actual growth

197. *Id.*

198. 2009 *California Climate Adaptation Strategy*, CAL. NATURAL RES. AGENCY (Dec. 1, 2009), http://resources.ca.gov/climate_adaptation/docs/Statewide_Adaptation_Strategy.pdf.

199. *Id.* at 22-28.

200. *Id.* at 27, 49, 62, 75, 85-86, 89.

under President Obama. The EPA's budget under President Bush in 2007 was just over 7.7 billion dollars.²⁰¹ That number grew to over 10 billion in 2010, but has since settled in around eight billion.²⁰² The EPA's influence does not end at the United States borders; the EPA also works "with other nations to protect the global environment."²⁰³ The federal government's strategy for containing climate change is effectively implemented by the EPA. This policy largely deals with regulating the emission of greenhouse gasses both by specific industries and individual products. As discussed above, these preventative-type measures will have very little impact on the immediate effects of climate change but could have a substantial impact on the future climate of the United States and the world. While we are past the point of preventing the climate from changing, proactive measures to reduce our future environmental impact are still essential to mitigate its effects. The EPA plays just one small part in the total legal climate change puzzle.

A prominent recent judicial decision involving the mitigating measures taken by the federal government is *Massachusetts v. EPA*.²⁰⁴ As the Court summarized, "a group of 19 private organizations filed a rulemaking petition asking EPA to regulate greenhouse gas emissions from new motor vehicles under § 202 of the Clean Air Act."²⁰⁵ The EPA refused their request and litigation ensued.²⁰⁶ By the time the case reached the U.S. Supreme Court, Massachusetts and several other state and local governments had intervened to join the cause.²⁰⁷

Rather than dispute the causal connection between greenhouse gas emissions and climate change, the EPA opted to argue "that its decision not to regulate greenhouse gas emissions" impacts the environment "so insignificantly" that it cannot be required to begin regulation.²⁰⁸ The majority disagreed, citing compelling statistics of just how much the transportation industry contributes to the greenhouse gas concentration in the atmosphere, and thus climate change.²⁰⁹ The EPA's argument that

201. *EPA's Budget and Spending*, U.S. ENVTL. PROT. AGENCY, <http://www2.epa.gov/planandbudget/budget> (last visited July 5, 2014).

202. *Id.*

203. *Our Mission and What We Do*, U.S. ENVTL. PROT. AGENCY, <http://www2.epa.gov/aboutepa/our-mission-and-what-we-do> (last visited July 5, 2014).

204. 549 U.S. 497 (2007).

205. *Id.* at 510 (internal quotation marks omitted).

206. *Id.* at 511.

207. *Id.* at 514.

208. *Id.* at 523.

209. *Id.* at 524-25.

carbon dioxide is not an air pollutant as defined in the Clean Air Act, and thus the agency lacked the authority to regulate its emission, also fell flat. The Court embraced climate change science in stating that carbon dioxide is an air pollutant within the meaning of the Clean Air Act because it may endanger the public welfare.²¹⁰ Justice Stevens delivered the opinion of the Court and found that the EPA was required to ground its action or inaction in regulating emissions from newly manufactured automobiles in § 7521(a)(1) of the Clean Air Act, which states:

The [EPA] Administrator shall by regulation prescribe (and from time to time revise) in accordance with the provisions of this section, standards applicable to the emission of any air pollutant from any class or classes of new motor vehicles or new motor vehicle engines, which in his judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare²¹¹

While the decision itself did not require the EPA to begin regulation of greenhouse gas emissions by newly manufactured automobiles, the Court essentially left the EPA without a choice. The EPA was forced to regulate emissions by automobiles because the science established that the emissions were contributing to climate change, thus ‘endangering public health or welfare’, and the Court’s decision mandated that such regulation must occur if an endangerment finding was made.²¹²

The *Massachusetts v. EPA* ruling was pivotal because not only did the Court fully embrace the science behind climate change, it also required an executive agency to take action when specific industries were directly contributing to the problem. The decision paved the way for more expansive EPA policy and regulation. *Massachusetts v. EPA* was decided in 2007. At that time, the EPA was under the direction of a much more conservative Executive Branch that could be classified as more resistant to the science of climate change than the current administration. It is unlikely that if a similar case were to arise today, the EPA would be as hesitant to regulate an industry causing a negative environmental impact. While the EPA’s budget has not grown as exponentially as widely believed,²¹³ it has certainly come under more scrutiny in its policymaking. This is likely a

210. *See id.* at 528-30.

211. *Id.* at 506 (citing Clean Air Act, 42 U.S.C. § 7521(a)(1) (2012)).

212. *Id.*

213. *EPA’s Budget and Spending*, *supra* note 201.

result of both the *Massachusetts v. EPA* decision and a White House that is willing to embrace the EPA's importance in slowing down climate change.

The EPA has continued to expand its rulemaking under the Clean Air Act since the Supreme Court's decision in *Massachusetts v. EPA*.²¹⁴ "EPA has already published in draft the Cars Rule, which sets motor vehicle emissions and fuel economy standards"²¹⁵ After "issu[ing] the endangerment finding" discussed in the opinion, the EPA began regulating greenhouse gas emissions beyond those created by the automobile industry.²¹⁶ One of the largest advances was the creation of the Greenhouse Gas Reporting Rule, which required over 10,000 industrial facilities nationwide to begin monitoring their greenhouse gas emissions.²¹⁷ More controversially, the Tailoring Rule, fashioned under the Clean Air Act's new source review program, allows for permits with upward thresholds to be issued on an industry-by-industry basis.²¹⁸ The construction of the rule was a three-year process, with the final Tailoring Rule being issued on May 13, 2010.²¹⁹ All types of operators within many industries will be regulated as a result of the Tailoring Rule permits, with electric power plants and petroleum refineries featured perhaps most prominently.²²⁰ The EPA is utilizing its power to lessen the future effects of climate change, but the present requires adaptive and preventive measures outside the scope of the agency's authority.

EPA regulation is only one type of legal action necessary to slow down and ultimately stop climate change; Congress will need to play a significant role as well. President Obama has brought the issue of climate change and the human effect on the environment to the forefront by advocating for clean energy and investing in alternative fuels.

Currently, there is little federal legislation directed solely at climate change.²²¹ However, all signs point to some type of international regulatory program emerging in the near future.²²² The United States' stamp of

214. See Michael B. Gerrard, *Defining the Challenge in Implementing Climate Change Policy*, 40 ENVTL. L. REP. NEWS & ANALYSIS 10579, 10580 (2010).

215. *Id.*

216. *See id.*

217. *Id.*

218. *See id.*

219. Joseph Mangino, *Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule*, U.S. ENVTL. PROT. AGENCY, 3 (June 2010), <http://www.epa.gov/apti/video/TailoringRule/tailoring.pdf>.

220. Gerrard, *supra* note 214, at 10580.

221. *See id.*

222. *See id.*

approval and participation in any such system is nearly essential for its success. The United States will likely first have to address climate change policy domestically before the country jumps on board with a multinational agreement. While congressional action may not be required to reduce greenhouse gasses in the atmosphere, implementation of programs to effectuate that purpose would be much easier and likely more effective guided by legislation.²²³

Due to the absence of comprehensive, standardized federal policy to reduce greenhouse gas emissions, there has been a large push for state action. Almost all states have initiated some sort of climate change program or discussed a plan to deal with its effects.²²⁴ States are also working in conjunction with each other to better implement regional climate change policy, the leading example being the Regional Greenhouse Gas Initiative (“RGGI”).²²⁵ The Initiative has implemented “a cap-and-trade program for carbon dioxide emissions from electric-generating facilities in 10 Northeastern and Mid-Atlantic states.”²²⁶ The RGGI has also begun “to adopt renewable fuel standards.”²²⁷ There has been discussion of merging the RGGI cap-and-trade program with similar programs from Canada and Mexico, resulting in a partial North American system.²²⁸

The model for state climate change legislation is California Assembly Bill 32. The bill, entitled the California Global Warming Solutions Act, was passed and signed into law in 2006.²²⁹ The goal is “to reduce [the levels of] six greenhouse gases . . . to 1990 levels by 2020 and to 80 percent of 1990 levels by 2050.”²³⁰ Assembly Bill 32 is much more aggressive than plans instituted by other states.²³¹ The legislation “grants regulatory authority to the California Air Resources Board—an institution with a long history of tough regulation and enforcement practices in the pursuit of clean air.”²³²

California Assembly Bill 32 targets larger emitters of greenhouse gasses.²³³ The legislature took aim at large industrial plants and utility

223. *Id.*

224. *Id.*

225. *Id.*

226. *Id.*

227. *Id.*

228. *Id.*

229. Marc L. Miller & Jonathan T. Overpeck, *Climate Change and the Practice of Law*, 47 ARIZ. ATT’Y 30, 36 (Oct. 2010).

230. *Id.*

231. *See id.*

232. *Id.*

233. *Id.*

companies first.²³⁴ Like the Regional Greenhouse Gas Initiative discussed above, the bill utilizes a “‘cap-and-trade’ system that limits overall greenhouse gas emissions from these key industries.”²³⁵ Although California started at the top, the regulation did not end there. The California Air Resources Board is authorized to develop “early action” measures.²³⁶ Pursuant to this power, “[t]he board has identified regulations of landfills, motor vehicle fuels, refrigerants in cars, tire pressure, port operations, and reduction of the use of high ‘global warming potential’ gases in consumer products.”²³⁷ The scope of Assembly Bill 32 was eventually expanded through Senate Bill 375 to reach cities, counties, and districts at the local level to require “climate-sensitive land-use arrangements.”²³⁸ By starting at the top and working its way down to the smallest businesses, the California legislature has successfully implemented a climate change prevention plan with a broad scope, proving that federal legislation may not be necessary to slow the effects of greenhouse gases.

Possibly the most resistant area of our culture to acknowledge the dangers and causes of climate change is the business world, specifically big business. The Securities and Exchange Commission took a large step to bring this segment of the economy up to speed when it issued an interpretive rule in February 2010.²³⁹ “[The] new interpreting rule remind[ed] publicly traded companies of the range of possible material risks from climate change and the obligation of companies to disclose those risks in filings.”²⁴⁰ The SEC has long required companies to disclose environmental risks to investors, and the ruling was primarily intended to point out that contributing to climate change is a risk that must be disclosed.²⁴¹ The development of securities regulation in the area of climate change is surprising and has the potential to create a new area of law as businesses attempt to adapt to the shift in how climate change is viewed. More attorneys will be needed to comply with the newly-minted SEC regulation and disclosure requirements. As climate change continues to

234. *See id.*

235. *Id.*

236. *Id.*

237. *Id.*

238. *Id.*

239. *Id.* at 37.

240. *Id.*

241. *Id.*

become a more prevalent issue in society, legal teams will be needed to navigate through the imminent expansion of regulation.²⁴²

While preventative and mitigating measures are a positive step in the right direction for the future, climate change is already upon us. A more relevant inquiry for the present is how will the law adapt to climate change and how will those tribes, who have barely contributed to the problem, be compensated for the damage they will suffer? Unfortunately, there is probably less progress in this area of the law than in any other dealing with climate change.

Potential for Restitution

Little legislation or regulation concerning a remedy for those damaged by climate change has been promulgated. However, there has been a bit of litigation. The most prominent and widely discussed litigation involving a plaintiff seeking damages for an injury suffered from climate change unfolded in *Native Village of Kivalina v. ExxonMobil Corporation*.²⁴³ The Native American village brought an action in federal district court against oil giant ExxonMobil and other energy companies based on nuisance for harms from the promotion of fossil fuels and suppression of evidence of the harmful contribution of greenhouse gasses to global warming.²⁴⁴ The Village of Kivalina alleged that the erosion of the Arctic sea ice, which protected their village from coastal storms and waves, was due to global warming.²⁴⁵ The Village claimed the erosion reached the point of making Kivalina uninhabitable, requiring the tribe to relocate at a cost \$95 to \$400 million.²⁴⁶ The Native American fight against the effects of climate change suffered a setback when the court dismissed the case, citing the political question doctrine and lack of standing.²⁴⁷

The court ultimately held that the political question doctrine barred the plaintiff's complaint for two main reasons. First, the factfinder would have to weigh the energy alternatives available in the past and assess their reliability as energy sources, safety considerations at the time, and the impact of those alternatives to consumers and businesses.²⁴⁸ The court "would then have to weigh the benefits [of those alternatives] against the

242. *See id.*

243. 663 F. Supp. 2d 863 (N.D. Cal. 2009), *aff'd*, 696 F.3d 849 (9th Cir. 2012).

244. *Id.* at 869.

245. *Id.* at 868-69.

246. *Id.* at 869.

247. *Id.* at 883.

248. *Id.* at 874-75.

risk that increasing greenhouse gases would” create global warming and thus induce flooding along the Alaskan coast.²⁴⁹ Second, the tribe was asking the court to make a judgment that the twenty-four defendants listed “should be the . . . ones to bear the cost of . . . global warming” despite nearly everyone on the planet contributing to it in some way.²⁵⁰ The court determined that these are questions better left to politics and the legislature rather than a court of law.²⁵¹ Furthermore, the district court held that the Village lacked standing for several reasons: the tribe could not trace their injury directly to the defendants, there were many alternative culprits responsible for the injury, and they could not establish adequate causation.²⁵²

Despite presenting a claim eerily similar to the successful suit against tobacco companies, the Village of Kivalina’s claim failed in the United States District Court for the Northern District of California.²⁵³ In dismissing the Village’s claim, Judge Armstrong delivered a blow not only to the Natives of Kivalina, but also to Native American tribes across the country. The court accepted the premise that the Village had suffered an injury, but ultimately refused to hold a select few corporations responsible for the actions of billions of people. While this is certainly sound law, it has potential to leave reservation inhabitants across the country without a remedy for harm suffered. The district court’s opinion is not necessarily indicative of what would happen in other districts across the country, but the precedent is now set. Given the thoroughness of Judge Armstrong’s opinion, it would be shocking to see a district take an opposing view. It appears that the courts are both capable and willing to require regulation of greenhouse gases that will lead to further injury but are unwilling to expand the law in order to provide restitution to remedy the harm done to Native American tribes caused by climate change. Given that protecting the innocent tribes is a job the United States government has chosen to accept, restitution for harm done must be allowed in some manner. Judge Armstrong rightly determined that this is outside the authority of the federal court system. Inevitably, this is a task that both the legislature and executive branch will be forced to undertake.

249. *Id.*

250. *Id.* at 877.

251. *See id.*

252. *Id.* at 877-81.

253. Miller & Overpeck, *supra* note 229, at 37.

Recommendations for Government Action

There is an urgent need for government action regarding climate change. Executive agencies and the court system have taken the lead in shaping policy for the country. Unfortunately, these branches' power to implement pro-active measures is extremely limited. The judicial and executive branches of government are essentially relegated to dealing with the consequences and harms that are the result of Congress's inaction. A real need exists for a comprehensive plan to pass through the legislature. As California Assembly Bill 32 and actions already taken by the Environmental Protection Agency have proven, mitigating measures can be implemented with relative success without the help of the federal legislature. Even these actions are not optimal, however, as legislation would make policy more efficient. Until that point, the government is essentially just patching holes.

The lack of movement by Congress is startling given the imminent consequences of climate change. It appears that public pressure will need to greatly increase in order to spur serious discussion in Washington. Unfortunately, the United States government has a tendency to be reactionary rather than proactive. It may not be until the physical impacts of climate change have created enough large-scale destruction that Congress decides to move. Climate change will eventually cause our most precious resource, water, to be increasingly more expensive and rare. Serious action will require a parting, at least to a certain extent, with our precious fossil fuels.

Suggested Judicial Action

Action in the federal court system has the potential to provide the most helpful relief to Native Americans of the Southwest. The courts will be forced to reexamine the *Winters* decision in the context of the evolving climate. Up to this point, courts have refused to expand *Winters* in order to adapt to the decreasing water supply in the Southwest. As the Colorado River Basin continues to lose its primary source in snowpack, there will inevitably be more than just ecosystem problems. The increasing strain on the water resources will put pressure on the *Winters Doctrine*. The waters currently reserved for the Indian reservations will likely become the envy of cities, private investors, and citizens as water becomes scarcer. With the future state of these waters in mind, the Supreme Court would be wise to expand *Winters*. Native tribes need the security of not only knowing that they have federally reserved rights in the waters of the Colorado River Basin, but that their reservations are given priority over the population

centers that surround them. *Winters* could be expanded to actually quantify a specific amount of water for each currently existing reservation or provide a specific percentage of the available water to each reservation.

Obviously, even touching the *Winters Doctrine* would be a drastic measure. Any Supreme Court decision to this effect would likely face overwhelming opposition from the non-Native public. General citizens' needs would potentially be placed behind those of tribes. However, given the current and the future climate, actually building on the *Winters* decision would keep true to the spirit of the law. The Court intended for tribal governments to have an abundance of water available to fulfill the reservations' needs, as evidenced by Justice McKenna's opinion for the majority in response to the argument advanced by the petitioners:

The case, as we view it, turns on the agreement of May, 1888, resulting in the creation of Fort Belknap Reservation. In the construction of this agreement there are certain elements to be considered that are prominent and significant. The reservation was a part of a very much larger tract which the Indians had the right to occupy and use, and which was adequate for the habits and wants of a nomadic and uncivilized people. It was the policy of the government, it was the desire of the Indians, to change those habits and to become a pastoral and civilized people. If they should become such, the original tract was too extensive; but a smaller tract would be inadequate without a change of conditions. The lands were arid, and, without irrigation, were practically valueless. And yet, it is contended, the means of irrigation were deliberately given up by the Indians and deliberately accepted by the government.²⁵⁴

This dicta in the opinion, while not binding, speaks clearly to both the Court's desires to provide plenty of water for the Indians and the original intent of those creating the reservations. This would require that the federal court system continue to provide adequate water for the Indians regardless of the shifting climate. The *Winters* decision also utilized one of the canons of construction of federal Indian law, that "[b]y a rule of interpretation of agreements and treaties with the Indians, ambiguities occurring will be resolved from the standpoint of the Indians."²⁵⁵ This rule also points to the obligation of the government to provide resources for the Indian

254. *Winters v. United States*, 207 U.S. 564, 575-76 (1908).

255. *Id.* at 576.

reservations, as neither the *Winters* decision nor the acts establishing the various reservations accounted for climate change that was unrealized at the time. This leaves ample ambiguity that requires interpretation favorable to the Indians. Furthermore, implementing such a judicial policy would work to fulfill the moral and contractual commitments that the United States owes the Native American tribes.

The court system should also consider providing a judicially-created remedy. The discussion above concerning the *Native Village of Kivalina v. ExxonMobil Corporation* decision revealed the legal impossibilities of allowing tribes affected by climate change to recover in tort for harm suffered from global warming. However, if the largest emitters of greenhouse gases continue to contribute to climate change and, worse, knowingly suppress evidence of their harmful activities, the courts could potentially provide a remedy to those affected. The Native American case for monetary damages under theories of fraud or negligence may gain merit as more time passes and climate change becomes a larger environmental problem.

Suggested Executive Action

The Environmental Protection Agency's policymaking has recently become much more active under the Obama administration. It has begun regulating greenhouse gas emissions from cars, factories, power plants, and petroleum refineries across the country. Still, policy has the potential to be much more aggressive than it currently is. The courts have allowed, and actually required, the EPA to regulate greenhouse gas emissions because they have been found harmful to the environment. This leaves the EPA with the discretion to become more active in the monitoring and regulating of climate change-inducing greenhouse gases. Currently, the political and financial climate of the United States as a whole is likely keeping the EPA from being more active. An immediate expansion of executive power could do more to hurt the cause of climate change reversal and adaptation than to help it because of the public opinion uprising it would cause. Again, it is hard to imagine the executive or judicial branches of government becoming much more proactive without a large shift of public opinion to view climate change as a real and immediate threat to the country's resources.

Suggested Legislative Action

The legislature could provide for restitution, relocation, mitigation, and adaptation measures. However, like any other climate change policy shift, there would be far reaching consequences—both positive and negative. A

policy shift is much needed to protect the Native American tribes, but in doing so, legislation could eventually damage the economy, citizens, or America as a whole. Short-term fixes producing those long term results would not be beneficial for the tribes.

The first and most viable option is for Congress to pass legislation appropriating government funds to help the tribes adapt to the coming changes. This would look much like the support the EPA provided the Hualapai Tribe in Arizona. Funds could be used to implement adaptive strategies through a number of different government agencies. Congress could allow funds for a division of the EPA that works exclusively with reservations, or a plan could be implemented through the Department of the Interior via the Bureau of Indian Affairs. Congress could easily provide for financing for the tribes to utilize in the construction of water storage infrastructure on the reservations, as well training and technology for the tribes to better conserve and efficiently consume their present water reserves. These types of adaptive measures must at least be a part of some larger comprehensive plan.

Congress could also enact legislation that provides for a migration plan for the Native American tribes of the Southwest that are in high-risk areas. This would require large amounts of funding, as entire villages would have to be moved. The government would most likely be responsible for constructing the infrastructure at the reservations' new locations. This would come at great cost to the taxpayers and would likely not be ideal for the Indians either. Many of the tribes have developed spiritual connections with the land on which they currently dwell. Not only is a relocation project a hassle, it also could be destructive to tribal cultures.

Another viable, but potentially costly option, is to enact legislation that creates a national fund for Native Americans to draw out of as needed to adapt to climate change. The fund could also be drawn on as the reservations demonstrate that they have suffered specific damages as a result of climate change. Whether the damages are the increasing price of water, loss of natural resources, or physical damage to the reservation, the tribes would be allowed to appear before an arbitrator and plead their case to draw on the fund. The way to finance this fund would likely be the biggest sticking point. Considering the fiscal climate of the country, the legislature is unlikely to raise taxes to create this relief fund, nor is there much wiggle room in the already tight budget with which the fund could be created from existing capital. This fund could work as a legislatively created remedy for the tribes impacted by climate change if Congress forced the largest emitters of greenhouse gases operating within the country

to pay a tax or fee. This penalty on emitters could be set up to require a certain tax per cubic foot of greenhouse gas emitted into the environment. This would hold those most responsible for the effects of climate change to compensate those most prone to injury. A major drawback of this strategy would be the reaction by the large corporations who already pay a high tax rate to operate inside the United States. A tax of this nature could ultimately hurt the economy if corporations opted to withdraw a portion of their business from the American economy in order to avoid the tax. All of these alternatives contain both positive and negative consequences. The best option is likely broad, sweeping legislation by Congress that incorporates a bit of each of these suggested strategies in order to efficiently protect and provide for Native American reservations across the Southwest and America.

Conclusion

This Comment is intended to contribute to the meaningful dialogue necessitated by climate change and its negative impacts on the Native American community in the Southwest. These tribes, who are largely innocent of contributing to the root causes of climate change, are the most susceptible to the environmental impacts of climate change. Climate change's impact is continuing and will continue until the United States government enacts adequate mitigating and adaptive measures. The country as a whole owes the tribes both a legal and ethical obligation to help guide their adjustment through an environmentally tumultuous time.