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### **Native Communities and Climate Change: Protecting Tribal Resources as Part of National Climate Policy: Executive Summary**

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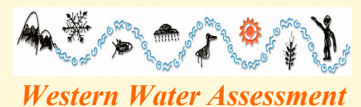


# Native Communities and Climate Change:


## Protecting Tribal Resources as Part of National Climate Policy

### Executive Summary

A Report Published by the Natural Resources Law Center at the University of Colorado Law School  
In Conjunction with the Western Water Assessment at the University of Colorado



Jonathan M. Hanna, NRLC Research Fellow, Principal Author & Editor



# Native Communities and Climate Change: Protecting Tribal Resources as Part of National Climate Policy

A scientific consensus has emerged in recent decades that human activities are causing considerable changes to our climate. Among the changes already observed are higher temperatures, rising sea levels, warming oceans, and melting polar ice sheets. These trends will continue even if significant policy changes are made, and they will grow much worse if we do little or nothing to address the problem.

While climate change will affect everyone, it will impact some disproportionately. Native American communities are among the most vulnerable. Climate change threatens tribal culture, resources, and ways of life. For this reason, it is imperative that Congress and executive branch agencies consider the special threats and disparate impact faced by tribes. Ample authority exists to support such consideration. In particular, the federal trust responsibility requires the federal government to protect tribal land and resources. This authority is rooted in numerous treaties, statutes, executive orders, and judicial opinions that recognize the very tribal rights at risk from climate change.

This report describes the special problems facing tribes as a result of climate change, focusing on four regions of the country. It then reviews federal authority for addressing these problems and outlines a course of action for federal policymakers.

Solving the climate change problem is a daunting task. But understanding how climate change poses special threats to tribes is crucial for enacting a successful climate policy.

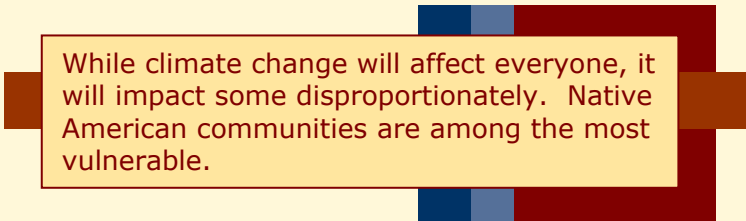
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## CHAPTER 1: THE CHANGING CLIMATE

Earth's climate is rapidly changing in significant ways. The Intergovernmental Panel on Climate Change (IPCC) predicts that the 21<sup>st</sup> century will experience accelerating rates of climate change, largely due to the build up of atmospheric CO<sub>2</sub> and the accumulation of heat in the oceans. Among the IPCC's latest findings, released this year:

**Temperature.** The most obvious, well understood and documented aspect of climate change is global warming. Global near-surface air temperatures have increased 0.74°C (1.33°F) over the past century (1906-2005). Temperatures are expected to rise another 1.1-6.4°C (2.0-11.5°F) in the 21<sup>st</sup> century, depending on future policies regarding greenhouse gas emissions. These changes in air and water temperatures drive most of the other climate change impact.

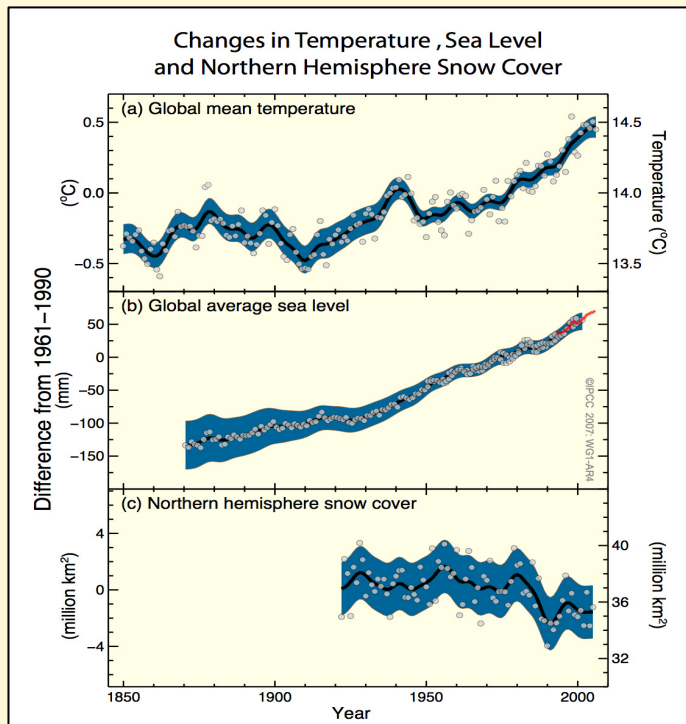
**Precipitation.** Precipitation trends are highly region-specific and remain difficult to forecast. Computer modeling increasingly suggests the possibility of future drying in much of southern North America, and stable or wetter conditions in the remainder of the continent.



While climate change will affect everyone, it will impact some disproportionately. Native American communities are among the most vulnerable.

**Sea Level Rise.** Rising ocean levels are primarily caused by thermal expansion of warming water and the melting of the Greenland and Antarctic ice sheets. Overall, ocean levels in the 20<sup>th</sup> century rose by approximately 0.17 meter (6.7 inches). In the 21<sup>st</sup> century, the IPCC predicts sea levels to rise 0.18-0.59 meters (7.1-23.2 inches), depending upon the emissions scenario considered. This IPCC estimate assumes no acceleration in the melt rate of the Greenland and Antarctic ice sheets, although many scientists expect that melting will accelerate. Thus, this IPCC estimate could prove too conservative. In addition to flooding low-lying coastal areas, sea level rises are expected to accelerate saltwater intrusion and increase the vulnerability of coastal communities and ecosystems to extreme weather-related events.





Observed changes in global average surface temperature, global average sea level, and Northern Hemisphere snow cover for March-April. Source: IPCC Fourth Assessment Report, Working Group 1 Summary for Policy Makers.

**Water Cycles/Supplies.** In basins where water supply is associated with snowmelt, warmer temperatures often result in an increased ratio of rain to snow, earlier snowmelt, decreased summer stream flows and, occasionally, higher winter stream flows.

**Extreme Events.** As temperatures increase, so too do the frequency and intensity of extreme weather events such as storms and droughts. Heat-related crises are an increasingly common occurrence in many places. By contrast, cold-related events (e.g., frosts, cold snaps) are increasingly rare. These trends are expected to continue.

**Environmental Impact.** Generally, increased warming is expected to shift many habitat regimes northward. Rising temperatures will also magnify extinction pressures on species requiring moderate and/or cooler habitats. Arctic habitats may be particularly vulnerable to the unusually high rates of global warming and ice melting already observed there. Extreme weather and water scarcity provide further stress.

## CHAPTER 2: THE IMPACT OF CLIMATE CHANGE ON NATIVE COMMUNITIES

Climate change is a global phenomenon and will affect everyone under even the most conservative future scenarios. However, a changing climate will not affect everyone equally. Native communities are particularly vulnerable, and the adverse effects of climate change will fall disproportionately on tribes even though their contributions to the problem are usually negligible. Tribes are often the first to see, and the first to feel, changes in the natural environment. Traditional

tribal practices and relationships with the natural world form the spiritual, cultural, and economic foundation for many Native American nations—foundations that will be, and in some cases already are, threatened by climate change. The following regional case studies highlight some of these threats.

**Alaska.** Alaska Natives provide perhaps the most compelling illustration of the harm that native communities already face from climate change. For centuries Alaska Natives have developed a rich trove of traditional knowledge that enables them to survive in this harsh climate. Climate change undermines their ability to rely on that knowledge. Warmer temperatures alter the availability of the species upon which Alaska Natives rely for subsistence. As permafrost thaws and ice thins, hunting becomes more difficult and dangerous.

Traditional tribal practices and relationships with the natural world form the spiritual, cultural, and economic foundation for many Native American nations—foundations that will be, and in some cases already are, threatened by climate change.

Climate change threatens not only the traditional subsistence lifestyle of Alaska Natives, but also their homes. Rising sea levels, thawing permafrost and reduced pack ice threaten coastal villages with inundation and increased vulnerability to storm surges. One recent federal study found that 86% of Alaska Native villages are at some risk from flooding and erosion exacerbated by climate change. For villages such as Newtok, Shishmaref, and Kivalina, conditions are so dire that relocation is the only option left, a process estimated to cost over \$100 million for a single village.

It is a bitter irony that Alaska Natives—some of the earliest inhabitants of North America whose subsistence lifestyle contributes little to the causes of climate change—are becoming some of the very first to be displaced by climate change.



A view of damage due to permafrost melting and bluff erosion in the Alaska Native village of Shishmaref. Due to these conditions, exacerbated by climate change, the only viable option is to relocate the village. This move is expected to be completed by 2009 and could cost well over \$100 million. Photo Source, NOAA.



Tribal dipnet fishing at Celilo Falls on the Columbia River in Oregon. This prolific tribal fishing location was inundated 50 years ago behind the newly-built Dalles Dam. Now, climate change poses further threats to salmon and the treaty fishing right. Photo source: Army Corps of Engineers archives.

**Pacific Northwest.** For centuries, salmon have been a cultural cornerstone for the Native American tribes of the Pacific Northwest. Thus, any harm to the salmon will necessarily harm those tribes whose identity is inextricably bound to these fish.

Climate change affects salmon in a number of ways. For example, less snow and more rain in the winter months will alter natural stream flows, affecting salmon migration from freshwater to the ocean and back. Also, changes to the nature and quality of the aquatic environment could destroy salmon habitat and spawning grounds, diminish food supplies, and increase the incidence of predators and aquatic contaminants. Rising air temperatures translate to warmer water, threatening salmon spawning and rearing. If streams get too warm, they will become uninhabitable to salmon altogether. One study estimates that by 2090, some states could lose over 40% of salmon habitat due to rising temperatures. These estimates do not take into account numerous other factors besides climate change that affect salmon viability. Over-fishing, deforestation, changing land use patterns, pollution, and other factors have already taken a serious toll on salmon populations since the 19<sup>th</sup> century.

When added to other pressures on salmon, climate change could turn the treaty fishing right into little more than a chance to drop a line in waters devoid of salmon.

In the Columbia River basin, historic (late 1800s) salmon runs were estimated at 11-15 million fish per year. A century later, they are estimated at 110,000-330,000, a mere 1.7% of their past numbers. Scientists have identified as many as 200 individual Pacific Northwest salmon stocks that have become extinct. Five more species of west coast salmon and steelhead are listed as endangered, and 21 others are considered

threatened. When added to other pressures, climate change could turn the treaty fishing right into little more than a chance to drop a line in waters devoid of salmon.

**Southwest.** For centuries, the Colorado River and its tributaries have been the lifeblood of southwestern tribes, including the Hopi, Navajo, Mohave, Apache, Tohono O'odham, and others. Historically plentiful waters enabled tribes to survive in this arid region by growing crops and raising livestock, traditional subsistence practices that many tribes still follow today.

A dramatic increase in the population of the Southwest has placed a severe strain on the water resources in the Colorado River basin. Today's users place such high demand on the river system that in most years the Colorado does not reach its outflow into the Gulf of California. Nor does this trend show signs of stopping. Nevada and Arizona alone are expected to double their population in the next 25 years.

The latest studies agree that runoff will decrease in the Colorado River basin due to climate change....Such reductions make clear that water scarcity will be the defining impact of climate change in the Southwest.

In light of the growing demand for finite water resources in the Southwest, the rising temperatures and increasing aridity brought by climate change could hold serious consequences. The latest hydrologic studies agree that runoff will decrease in the Colorado River basin due to climate change. Estimated decreases range from an 11% reduction by the end of the century to a 45% decrease by the middle of the century. Even at the low end, such reductions make clear that water scarcity will be the defining impact of climate change in the Southwest.



Recent drought conditions seen on the Gila River. Water scarcity due to climate change in the Southwest will only exacerbate existing pressure. Increased demand for decreasing water supplies will have serious implications for tribes, as competition between tribal and non-tribal users will make water adjudication and negotiation more difficult. Photo Source: U.S. Geological Survey.



Tribes often hold federal reserved water rights that are among the most senior in the prior appropriation scheme of water allotment in the West. Yet many tribal water rights remain unquantified and tribal access to water rights is often impeded by the lack of infrastructure. In a warmer and drier Southwest, competition for water resources will only become more fierce, posing significant challenges for tribes, and also threatening the already unstable and delicate allocation for all southwestern residents.

**Florida.** Perhaps the most dramatic impact of climate change for Florida tribes will stem from the predicted rise in sea levels. Florida has approximately 4,500 square miles of land within five feet of sea level. While this is only a small portion of the total state, much of this low elevation consists of the Everglades in the southern tip of Florida. Tribes have long called home the mangrove forests, cypress domes, and sawgrass prairies of the Everglades. Today, the Miccosukee and Seminole have a number of reservations in and around this area.

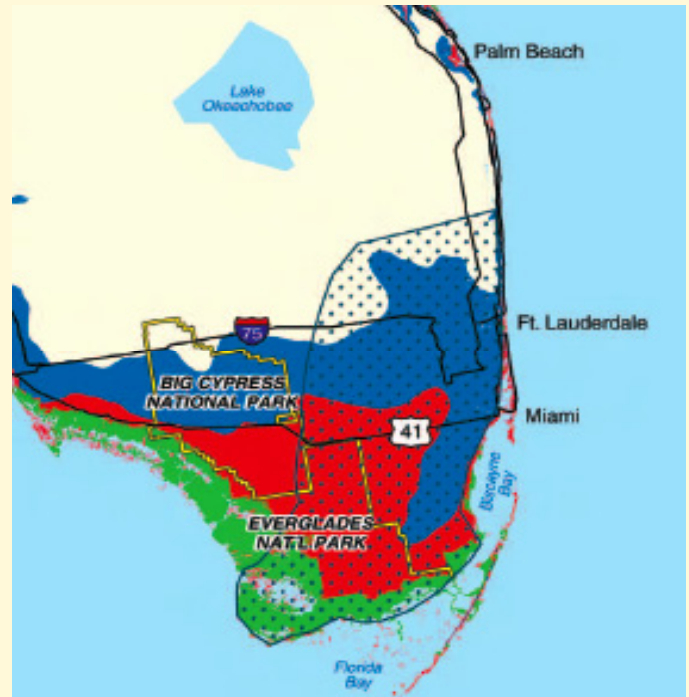
The Miccosukee and Seminole tribes also have a long history of subsistence activities such as hunting, fishing, and growing food crops in and around the Everglades. Rising temperatures, changing weather patterns, encroaching sea levels, and saltwater intrusion could all have devastating impact on the plants and animals upon which the tribes rely to support their traditional practices.

Even a modest rise in sea levels due to climate change could have tremendous and negative effects. Flooding will result in loss of tribal lands. Storm surges will reach further inland, leaving additional destruction in their wake. Saltwater intrusion into the Biscayne Aquifer threatens the freshwater supplies for all of southern Florida.

### CHAPTER 3: CONGRESS AND EXECUTIVE AGENCIES SHOULD ACT TO ADDRESS CLIMATE CHANGE IMPACT ON TRIBES

A number of factors compel the federal government to take action to address the severe and disparate impact that climate change will have on native communities. At the heart of this obligation is the trust responsibility, which requires the federal government to protect tribal land and resources. Moreover, many aspects of tribal culture—for example, subsistence practices and water rights for tribal lands—have long been recognized and protected by treaties, statutes, and judicial decisions. If, as predicted, climate change makes water and other natural resources more scarce, tribal protection of these interests could pose significant problems for current patterns of use and consumption by non-tribal parties, thereby requiring federal intervention.

Addressing the causes of climate change and adapting to its consequences will not come cheaply. For this reason, the federal government must recognize that climate policy will only be effective if it generates the substantial sums of money these efforts will require.



A map showing Florida's vulnerability to sea level rise. The red area is less than 5 feet above sea level, the blue area is land less than 10 feet above sea level, and the dotted area is the Biscayne Aquifer. Rising sea levels due to climate change pose a serious threat to the Everglades. Loss of coastal ecosystems and resident species, saltwater intrusion, and increased vulnerability to storm surges could have significant negative impact on the tribes that reside in this area. Source: Environmental Protection Agency, *Saving Florida's Vanishing Shores*.

**Trust Responsibility.** The federal government has a unique trust relationship with American Indian tribes. This relationship, which is embodied in thousands of treaties, statutes, and executive orders and recognized in countless judicial opinions, provides Congress with the authority to pass legislation that will address the specific effects of climate change on American Indian communities. In some particular circumstances where tribal rights are threatened by climate change, the trust responsibility may create a legal obligation requiring the government to act. While courts are often reluctant to order the federal government to take specific actions pursuant to the trust responsibility, there have been occasions where rights to both damages and injunctive relief have been recognized. Furthermore, judicial caution in enforcing the trust obligation does not lessen the federal government's legal and moral responsibility to take action when tribal land and resources, which form the basis for tribal sovereignty, face threats as serious as those from climate change. The trust responsibility should also encourage federal agencies to interpret and apply statutory and administrative climate change policies for the benefit of native communities.

**Treaty Rights.** Rights to land, water, fish, and wildlife guaranteed by treaties, as well as other solemn legal commitments with tribes, impose a clear duty on the federal government. As tribal resources are threatened by changing climate, the federal government has an obligation to take action. For example, in a series of treaties signed with the government over 150 years

ago, the tribes of the Pacific Northwest ceded significant portions of tribal land while reserving the right to fish for the salmon that have always been a mainstay of their culture. This treaty right has been the subject of extensive litigation in the intervening years, and has continually been upheld. Significantly, a federal district court in Washington State held in 1980 that the right to fish identified in the treaties includes an implied right to protection of the habitat from environmental degradation. As climate change affects salmon populations and habitat, the potential for further litigation to vindicate tribal treaty rights seems inevitable.

A number of factors compel the federal government to take action to address the severe and disparate impact that climate change will have on native communities. At the heart of this obligation is the trust responsibility.

Whether a court would compel the government to mitigate the effects of climate change on a tribe's resources or to grant damages for the failure to protect Indian rights from the impact of climate change remains unknown. But the prospect for litigation may impel the political branches to seek proactive solutions to address these problems.

**Statutory Rights.** Tribes also have statutory rights. For example, a number of federal statutes recognize the importance of the subsistence hunting and fishing to which Alaska Native communities are so intimately connected. The Alaska National Interest Lands Conservation Act (ANILCA) gives subsistence uses priority over non-subsistence uses on the state's public lands. Furthermore, the Endangered Species Act (ESA) and the Marine Mammal Protection Act carve out exemptions from their provisions to protect Alaska Native subsistence practices. Impact on subsistence uses wrought by climate change will certainly implicate these and other statutes. Protections or exemptions are of no value if the species upon which subsistence lifestyles are based disappear.

Climate change will likely force legislators to re-examine existing statutory law relating to tribal interests, as well as to consider new legislation. Congress has the power to legislate in the field of Indian affairs and, where a reasonable connection between climate legislation and protection of Indian resources exists, any such legislation protecting Indian rights will almost certainly be upheld. Similarly, if a federal agency decides that it will implement existing or new statutory programs in ways that protect Indian resources from the impact of climate change, there is little doubt that any reasonable decision made by the agency to do so will be upheld by the courts.

**Common Law Rights.** While treaties and statutes create many tribal legal rights, judicial decisions often explain, refine, and shape the contours of these rights. Water rights are among the most important legal entitlements that accompany a tribal land treaty. In *Win-*

*ters v. United States*, decided in 1908, the U. S. Supreme Court held that Indian nations on reservations set aside for agricultural use have a right to enough water to grow crops. Significantly, the Court also held that this "reserved right to water" exists irrespective of whether a tribe has yet taken any steps to divert or use the water. The priority date for Indian nations is the date of their land treaty or executive order, which puts many tribes at the front of the line when it comes to competing with non-Indian water users. This *Winters* right, as it has become known, makes Indian nations powerful players in the allocation of those scarce supplies of water west of the 100<sup>th</sup> meridian. If, as expected, climate change places an added strain on water availability, this right will become ever more valuable to tribes.

**Environmental Justice.** Climate change raises many issues of fairness and justice to tribes. As noted previously, for example, Alaska Natives following traditional subsistence lifestyles contribute virtually nothing to climate change yet suffer some of its most serious effects. Disappearing sea ice, rising sea levels, changing weather patterns, higher temperatures, and other factors threaten to destroy native villages and many of the plant and animal species upon which these people depend.

An Executive Order signed by President Clinton in 1994 requires each federal agency to work to achieve environmental justice in agency policies and regulations. While the Order is not enforceable in court, federal agencies have subsequently incorporated considerations of environmental justice in their operations. If principles of environmental justice mean anything—and, in light of the federal trust responsibility, they should—then the government must use them to help shape federal climate change policy.

Rights to land, water, fish, and wildlife guaranteed by treaties and other solemn legal commitments with tribes impose a clear duty on the federal government. As tribal resources are threatened by changing climate the federal government has an obligation to take action.

## CHAPTER 4: RECOMMENDATIONS FOR ACTION

Congress is currently engaged in a far-ranging debate over legislative proposals relating to climate change. As legislators and agencies begin to craft national climate change policy, they must fully understand and address the impact on native communities. To that end, this report makes the following recommendations:

**Tribal Participation.** Informed decisions as to how best to protect tribes from the effects of climate change must begin with a clear understanding of the likely impact. As Congress debates federal climate change legislation, they should call for Congressional hearings to provide such information. Clearly, this would include



testimony from the scientific, academic, and private sector communities. Most importantly, though, Congress should hear from the tribes themselves. Such first-person accounts will undoubtedly be the most compelling evidence of how climate change affects native communities. In addition, as Congress expands the administrative framework dealing with climate change, they must ensure that tribes are able to provide ongoing input into national climate change policy and programs.

Informed decisions as to how best to protect tribes from the effects of climate change must begin with a clear understanding of the likely impact. As Congress debates federal climate change legislation, they should call for hearings to provide such information.

**Adequate Revenue-Raising Mechanism.** While debate continues over a wide range of legislative initiatives, none of the current proposals will likely generate the substantial revenues needed to finance mitigation and adaptation efforts in response to climate change. Mitigation and adaptation will be costly. As described in the case studies, certain native communities will be especially affected. Any national climate policy to address the impact on tribes must provide a substantial revenue-raising mechanism if it is going to be adequate.

Fortunately, climate change offers relatively simple opportunities to raise considerable revenues. For example, a carbon tax at a level that provides incentives for non-carbon-based activities could raise billions of dollars. Likewise, fees might be set for carbon emission allowances. Some of the bills currently being discussed in Congress do contemplate the need for fee-based allowances to raise revenues, and some of them expressly acknowledge the need to address unequal impact of climate change. The proposals that contemplate revenue generation, however, are too modest to raise the amounts that will be needed to adequately address the likely consequences of climate change. These proposals will likely fall short of what will be needed to fund mitigation and adaptation efforts, especially with regard to disproportionate impact on tribes.

Mitigation and adaptation will be costly. As described in the case studies, certain native communities will be especially affected. Thus, any national climate policy to address the impact on tribes must provide a substantial revenue-raising mechanism if it is going to be adequate.

**Alternative Energy Development Funding for Tribes.** Because fossil fuel emissions are such a major contributor to climate change, development of alternative energy technologies will be an important component of any future strategy. Tribes have some of the greatest resources (e.g. wind and solar power) for helping the nation with renewable energy development. At the same time, they are among the most vulnerable to impact from climate change caused in large part by conventional fossil fuel-based energy development. Helping tribes develop alternative energy technologies both on reservations and as part of a national renewable energy program can help overcome this contradiction.

Alternative energy projects take investment capital, infrastructure, and technical capacity that tribes often lack. Development of renewable energy resources by tribes on their own will do little to mitigate the impact from climate change on their communities. However, tribes can play an important role in any national or international solution.

For this reason, any renewable energy program at the federal level must include opportunities and incentives for tribes. Such a program should include technical assistance and subsidies for individual projects on reservations. The government should also provide financial assistance to establish transmission lines to connect tribal projects to the national energy infrastructure.

Tribes have some of the greatest resources for helping the nation with renewable energy development. At the same time, they are among the most vulnerable to impact from climate change caused in large part by conventional fossil fuel-based energy development. Helping tribes to develop alternative energy technologies both on reservations and as part of a national renewable energy program can help overcome this dichotomy.

**Administration of Federal Programs to Protect Tribal Resources.** In order to meet its trust responsibility to tribes, the federal government should operate government programs to protect treaty and other tribal rights in light of climate change impact. This may implicate many programs not particularly directed at tribes. But national mitigation efforts that benefit tribes will benefit everyone. Recently, the Supreme Court recognized that the Environmental Protection Agency has the authority to regulate greenhouse gases from automobile emissions. A subsequent Executive Order asks the agency to implement regulatory measures soon. In setting the level and extent of greenhouse gas regulation, the EPA should take into account the trust obligation that the federal government owes to tribes, as well as the environmental justice executive order and the need to address the disproportionate impact to tribes.

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## CONCLUSION

**A**s the latest report from the IPCC makes clear, our climate is changing in significant ways. While all of us will certainly be affected to some degree, some will bear disproportionate impact from climate change. Among those disparately affected are native communities. Their traditional lifestyles typically contribute little to the causes of climate change even as the change fundamentally harms tribal culture and the close relationship tribes have with the land, water, wildlife, and other natural resources.

Congress and executive agencies must act to address and resolve climate impact on tribes to fulfill the federal trust responsibility, as well as obligations under treaties, statutes, executive orders, and common law doctrines. If they fail to do so, tribal enforcement of these rights in the face of increased scarcity and competition could well force the government's hand.

As legislators begin to craft national policy on climate change, it is essential that they fully understand and address the impact on native communities. This report makes several recommendations to that end:

- Congress should hold hearings on the impact of climate change to tribes, as well as provide opportunities for meaningful and continued input from tribes into national climate policy and programs.
- National climate policy must include an adequate revenue-raising mechanism to finance the costly adaptation and mitigation efforts necessary to address disparate impact on tribes.
- The federal government must provide alternative energy development funding and technical assistance for tribes.
- The federal government must administer federal programs to protect tribal resources.

With these and other measures, the federal government can fulfill its special obligation to tribes and ensure solutions that are fair and equitable for all.

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