

Impact of climate change on water resources and the implications for western nati...



Climate change is a result of human activities leading to the emission and subsequent accumulation of greenhouse gases into the atmosphere, trapping heat and radiation within Earth. As of 2015, Earth's global temperature has increased by 2.17 °F since 1900. ^[1] Furthermore, climate change impacts water temperature because of the important role water plays in absorbing the excessive heat within Earth's atmosphere. The ocean's absorption of heat led to an increase in average global sea surface temperature of 0.94°F in the period of 1955- 2015. ^[2] The rising global temperature and water temperature is already deleteriously impacting many species of animals that are unable to adapt to environmental changes. Humans are also encountering consequences as well: more frequent droughts, extreme weather, and natural disasters are all impacting humans around the world. However, climate change is disproportionately impacting specific vulnerable groups, such as Native Americans, who lack health care services and advanced infrastructure. ^[3] To emphasize the influences of rising water and global temperature on vulnerable groups, I will examine several Native American tribes in the west: the Navajo Indians, Alaskan Indians, and Pacific Northwest Indians and a noteworthy water resource of each tribe. These indigenous tribes have already encountered serious consequences of climate change due to their proximity to nature and water resources, both geographically and culturally. ^[4] Currently, climate change is seriously impacting Native American tribes in the west, such as the Navajo Indians, Alaskan Indians, and Pacific Northwest Indians by raising the global temperature and water temperature, impacting essential water resources, such as clean water, arctic ice, and certain aquatic animals. Consequently,

the lifestyle and culture of these Native American tribes, who live intersubjectively with nature and rely on water resources, are disrupted as their habitats and ecosystems are destroyed. The disproportionate impacts on impoverished minority groups, such as Native Americans, relative to those who have access to resources demonstrate the role of climate change in perpetuating inequality amongst vulnerable populations.

A very significant water resource that climate change influences by increasing water temperature is clean water from natural sources. Because many Native American tribes, most notably, the Navajo Nation, are deficient in advance water supply systems, they are substantially reliant on rivers and streams, springs, and wells for clean water. However, the Navajo Indians reliance on these natural water sources makes them vulnerable to the changes in water temperature. Any direct changes in the availability of clean water will have direct influences on the tribe's sustenance, which we have seen for the past decade. Rising water temperature has been affecting water quality and availability of clean water from their water sources through a sequence of modifications in the environment. First, the initial decrease in rates of precipitation, as a result of rising water temperature, produces changes in the physical and hydrologic environment by ultimately drying up the soil, causing the inability to absorb water and ruining water wells and springs that Navajo Indians partially used as a water source. ^[5] The decrease in precipitation, followed by the soil's inability to absorb water leads to greater intensity and frequency of droughts. Subsequently, more intense and frequent droughts diminish the availability of clean water drastically and concurrently damage water quality by increasing nutrient concentrations and

residence times in streams, leading to harmful accumulation of algae and other pollutants ruin the quality of lakes and rivers (NCA 2014). ^[6] The Navajo tribe's vulnerabilities as a result of their reliance on the natural water sources amplify the effects of climate change, which in turn affects their lifestyle and culture. With their wells and springs dried up and rivers and streams full of contaminants, Navajo Indians lack clean water for drinking and growing plants for sustenance. Furthermore, the Navajo Indians' reliance on natural water sources, as opposed to running water, has a cultural impact because water has become part of their culture: " We are very rural because of the way of life that we have known for a very long time." ^[7] Their deteriorating access to clean water is forcing them to rely on external groups, such as the Navajo Water Project, to provide them with water sources. ^[8] Thus, the Navajo Indians are sacrificing cultural traditions, related to the gathering of water, to enable access to clean water through human-made water sources.

Rising temperatures are even more catastrophic to Native American tribes that are dependent on water resources susceptible to warmer temperatures, namely Arctic ice and permafrost. Global temperature and surface water temperature is accompanied by the significant reduction in thickness of sea ice and the thawing of permafrost, both of which having substantial implications for Alaskan Natives. These repercussions include alterations of subsistence method due to sea ice melting and ultimately relocation as a result of permafrost thawing. Studies that examine the melting of sea ice have found that rising regional temperatures over the past two decades accelerates the rate at which the sea ice becomes thinner, at twice the <https://assignbuster.com/impact-of-climate-change-on-water-resources-and-the-implications-for-western-natives/>

global scale. ^[9] As sea ice becomes thinner, sunlight can penetrate it and heat up the water underneath, which increases acceleration of the rate of melting. Therefore, sea ice melting follows an exponential pattern and arctic ice in Alaska may cease to exist in several decades if the current trend continues. ^[10] The repercussions of this phenomenon as a result of climate change are disastrous, especially so for Alaskan Natives because they utilize Arctic Ice as modes of transportation and as tools for hunting. Currently, physical effects of sea ice melting and thinning includes dangerous hunting conditions and hazardous travel routes. ^[11] The potential risks of severe injury deter Alaskan Indian tribes from hunting and fishing food, which was their primary sustenance. Thus, many Alaskan Indians have been forced to alter subsistence activities and traditions that have existed for many years and also depend on nontraditional foods. Hence, sea ice melting resulted in the loss of culture. The loss of culture is further intensified by permafrost thawing, as mentioned earlier, by forcing them to relocate from hazardous conditions. Permafrost thaw is a result of rising global temperatures and water temperatures causing permafrost, the permanently frozen soil, to thaw from the surface. Similar to the positive feedback loop of arctic ice melting, permafrost melting accelerates the rate at which it melts. The circuit occurs due to a natural characteristic of permafrost: it stores carbon within the ice, containing twice as much carbon as the atmosphere does. ^[12] When permafrost thaws, the carbon is released, exacerbating climate change by releasing more greenhouse gases and subsequently accelerating permafrost thawing. ^[13] Physical impacts of permafrost thaw include erosion and flooding, which has already destroyed the homes and communities of the

Alaskan Indian tribes. Forced to relocate entire villages, the Alaskan Indians have lost the culture, history, and traditions on that land where they have stayed for centuries.

Rising water temperatures can also indirectly impact Native Americans by affecting their primary sources of sustenance. Though increasing water temperature is currently affecting many animals, such as coral reefs and polar bears, I will delve into the Pacific salmon, namely for its significance in the culture of Pacific Northwest Indians. The Pacific salmon has a pivotal role in Pacific Northwest Indian culture because salmon is the primary source of subsistence in the community. Though rising water temperature does not drastically impact them directly as it did for the Navajo Indians and Alaskan Indians, it has extremely detrimental effects on the Pacific salmon, which in turn affect the Pacific Northwest Indians. The Pacific salmon can only survive in certain water temperatures, and the rising water temperature is causing disaster in the population. For instance, water temperature increase in streams and rivers, where Pacific salmon spawn and temporarily live in, allows the accumulation of harmful bacteria. ^[14] This, in turn, increases the susceptibility and exposure to diseases of the Pacific salmon. Since salmon spawns in the river and streams that are contaminated with bacteria, the population is drastically affected because newly hatched salmon will die in greater proportions due to disease. ^[15] Furthermore, warmer water results in higher streamflows, which also affects salmon spawning by damaging nests and washing away eggs. ^[16] The higher streamflows also create further difficulty for salmon migration by requiring more energy to swim against. As a result, a greater proportion of salmon completely deplete their energy

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reserves and end up dying before they can spawn. ^[17] If water temperature continues to rise and exacerbates the current influences on the Pacific Salmon, the Pacific Salmon will become extinct in the future. The physical impacts on the Pacific Northwest Indians as a result of the decreasing salmon population are becoming more and more apparent as climate change intensifies. Since salmon comprises the majority of their source of protein, the Indians are forced to find alternatives, which is difficult with their technology. ^[18] There are not many rich sources of protein like the salmon in the Pacific Northwest; therefore, many Indians have become malnourished as a result of the lack of protein. ^[19] Besides the physical impacts, the decreasing salmon population has severe cultural implications due to the intimate relationship between the Pacific Northwest Indians and the Pacific salmon. The spiritual connection is exhibited by some of the mythological beliefs. For instance, the Pacific Northwest believed salmon were supernatural beings who voluntarily assumed piscine form each year to sacrifice themselves for the benefit of humankind. ^[20] The decreasing salmon population will disrupt such cultural relationship and traditions with salmon.

The impact of climate change on these Native American tribes demonstrates how inequality and marginalization contribute to the increase of vulnerable populations, which explains for the disproportionate impact of climate change relative to the general population. Furthermore, within these vulnerable populations, greater exposure to effects of climate change ultimately perpetuates the inequality by leaving them disadvantaged and at continual risk. The following excerpt from a UN briefing draws a connection <https://assignbuster.com/impact-of-climate-change-on-water-resources-and-the-implications-for-western-natives/>

between inequality and climate change: “ Exposure to the adverse effects of climate change is largely determined by location where people choose or are forced to live. Economic inequality or political inequality many compel many disadvantaged people to live in locations prone to climate hazards.” [21]

Based on the excerpt, we can see how inequality and marginalization contributed to the vulnerability of the Native American tribes we’ve discussed. The Navajo Indians, Alaskan Indians, and Pacific Northwest Indians encounter political and economic inequality due to years of marginalization by the government, forcing them to situate in water-based areas that enable self- sustenance. [22] However, as we’ve seen, climate change has a significant influence on water resources, such as clean water, ice, and seafood, leaving the Native American tribes in near ruins as their reliance to these resources have amplified the impact of climate change. It is important to take note the process of recovery from and/or adaptation to climate change. The same UN briefing argues: “ Inequality also limits the access of disadvantaged groups to the private, communal, and public resources necessary to cope with and recover from the damages caused by climate hazards”. [23] Therefore, the process of recovery is made much more difficult by a contributing perpetrator of the damages: inequality. In reference to Adam’s argument, Native Americans would fall on the bottom-end of the socio-economic hierarchy of effects. [24] Representing the extreme case of inequality as marginalized groups, many Native American tribes lack most of the resources necessary to recover from loss and have difficulty adapting to their critical situation due to insufficient government support. [25]

In strict contrast, higher income households at the top of the socio-economic

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hierarchy have higher social position and are able to exercise greater control over common resources. [26] Thus, climate change has minimal to no impact on them. This comparison between two ends of the spectrum in the realm of inequality for access to resources displays the disparity in the impact of climate change and the role of climate change in perpetuating the inequality found in the socio-economic hierarchy.

Climate change will have drastic consequences worldwide in the future, and the negative influences are currently affecting vulnerable groups, such as Native Americans. The Native American reliance on nature due to lacking advance infrastructure, as a result of inequality, and interdependence with nature creates the vulnerability of many tribes. Currently, Western Native American tribes such as the Navajo Indians, Alaskan Indians, and Pacific Northwest Indians are encountering the forefront of the consequences of climate change, and they are disproportionately affected by climate change as their lifestyles and culture, which revolve around living near to water, are disrupted. The Navajo Indians are impacted physically by water resources when their clean water sources become scarce as a result of droughts, bringing about many health risks. The Pacific Northwest Indians, on the other hand, are affected as an upshot to the rapidly decreasing Pacific salmon population. Pacific salmon, which has a cultural significance in the Pacific Northwest, are unable to adapt to warmer water, resulting in dwindling numbers and leading to the cultural loss. Similarly, the cultural loss is currently seen throughout Alaska with the Alaskan natives. The Alaskan natives are losing their homes and hunting traditions as a result of permafrost thaw and arctic ice melting, respectively. The physical and

cultural impacts on the Navajo Indians, Pacific Northwest Indians, and Alaskan Indians demonstrate the potential disaster that climate change will release in the future if no dramatic precautionary action is taken.

Furthermore, the overall impact of climate change on these Native American tribes display how climate change has disproportionate impact, depending on the positioning on the socio-economic hierarchy. Native American tribes have already begun taking action to adapt to climate change, such as the Coquille tribe in the Pacific Northwest. The Coquille tribe recently developed a sustainable forestry initiative that combines Western Science with Traditional Ecological Knowledge. ^[27] TEK allows the detection of environmental changes, adaptation strategies in regards to such changes, and principles for managing and sustaining the land. TEK in addition to Western Science will be important factors in inhibiting the accelerating climate change impacts. ^[28] Furthermore, it is important to take note the relationship between inequality and vulnerability to climate change to effectively fend against climate change.

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