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## **Climate Change in New Mexico**

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## Climate Change in New Mexico

### Part 1

The focus of this paper is addressing areas of concern regarding climate change in the state of NM. Although there are many issues related to climate change the scope of this paper will be limited to the decreased level of surface water and water flow, likely due to an increase in average temperatures. The low water levels cause difficulties in recreation, economy, and interstate relationships.

New Mexico is seeing a decreased level of water due to an increase in average temperatures. NM has seen an increase of 2.07 degrees Fahrenheit over the past 124 years (Segarra, 2021). This does not seem like much; however, it has a significant impact on the surface water. Surface water is influenced by the snowmelt that occurs. Increased temperatures mean that the snowmelt will happen earlier. Compared to the 1940s, the snowmelt is happening approximately a full month earlier in the year. During a KRQE interview, UNM professor Peter Fawcett states that, “the change in snowmelt timing also changes how much water is lost to the atmosphere before it can be used.” (Segarra, 2021)

It is easy for me to relate the decrease in water in rivers and lakes in New Mexico. I can recall swimming in the Pecos River and tubing in Brantley Lake as a child. The “beach” in Carlsbad had a three-story platform that one could jump off into the river. As a parent, I cringe at the thought, but with current water levels, it is not even a possibility. That structure was removed several years ago because of the danger it posed.

Water availability also has an impact on the amount of water allowed to flow to Texas. This impacts a multi-state water sharing agreement known as the Rio Grande Compact. New Mexico is already in debt with regards to the amount of water owed to Texas. (Wyland, 2021) The amounts owed are determined by the amount of water collected in reservoirs the previous year. This means if a wet year is followed by a dry year, as has happened, the state doesn't have the water owed to Texas. If droughts continue, the 72-year-old contract, may need to be revisited. There may need to be another way that the water is divided between the states.

Another complication of increased temperatures influencing the water sharing compact was evident in 2014 when Texas asked New Mexico to store water during a tropical storm. Texas asked New Mexico to hold water to avoid flooding during the tropical storm. While only being stored for months, a significant amount was lost due to evaporation. Texas believed it was still due the original amount, despite evaporation. This contention reached the Supreme Court, and eventually it was determined that New Mexico was not held accountable for the evaporated amount (Benson, 2020). If tropical storms and hurricanes in neighboring states increase, this could become an issue that needs to be addressed soon. These storms will increase the flow of water to Texas from New Mexico and similar problems will reoccur. New Mexico's increasing temperatures are not going to let up, and evaporation is likely to happen in another storage situation. With this set as a Supreme Court case, however, hopefully this precedent will help in such decisions of the Pecos River Master. The calculations of the River Master reflect how much water is to remain and be used in New Mexico.

## Part 2

According to the NOAA National Centers for Environmental Information State Climate Summary for New Mexico, 2019, projections of spring precipitation show decreasing precipitation amounts across most of the state. While the annual amounts are uncertain, decrease in spring rains and warmer temperatures will decrease the amount of water flow. Combined with previously described decrease in water levels and drought this can lead to a decrease in overall quality of life for many populations. This will focus specifically on the Navajo Nation as their vulnerability has become more publicly known since the Covid 19 pandemic.

Access to water, or lack of water has so many intertwined implications. The saying “Water is Life” is recognized well in the desert. The Navajo Nation already has limited access to water. Primary sources of water on reservations are community water taps. Other sources are not regulated including livestock wells. (Grytdal et. al, 2018) Any change in water quality is going to have great impact on the Navajo. Drought has a great impact on water quality.

A low flow decreases the amount of oxygen available to fish. Algae production increases in turn increasing toxicity. Nutrient densities can increase because higher flow would otherwise dilute them. In contrast, nutrients that would otherwise be flowing downstream are not going to flow to those areas (Bunch, 2018). The differences in the content of the water influence all those who depend on that water. Lower flow can increase the number of pathogens that are able to grow because of water temperature increase and stagnation. Even swimming in these waters is a risk, because of the potential of contact with contaminants through breathing, accidentally swallowing, or exposure through mucous membranes.

Food security is threatened in many ways by drought. There is less water available for growing food. This limits livestock by reducing food and water available to them, as well. The livestock kept are more likely to be malnourished, diseased, or die. Many families have had to give up generations of raising livestock because they lack the resources to continue. This is a great impact to cultural history and way of income. Mental health effects such as anxiety, depression, and stress are increased. The National Drought Mitigation Center describes these combined effects as “drought dominoes.” (NDMC, 2021)

Limited water access’ impact on health was really brought to attention during the Covid-19 pandemic. As the pandemic continues, we also continue to see how these impacts are combined to negatively affect the well-being of the people of the Navajo Nation. Navajo are exceptionally vulnerable in several ways. Lack of tap water decreases basic sanitation, and limits ways to stay healthy. Sugary drinks are easier to obtain than water. Water for cooking is limited. Water in the ground in many areas is contaminated by old uranium mines. All of this greatly reduces the collective health of the Navajo community.

## Part 3

There are several ways to begin decreasing the impact of climate change. More planning for droughts, improving water storage and transportation as well as new innovations will all help decrease the negative effects of climate change on the population. As previously seen by the

court case of Texas vs. New Mexico, evaporation is a great concern with storage. Better transportation methods are needed for water. While costly, transportation to completely depleted areas may be needed. Innovation is needed for ways to get water to the communities that need it. Various universities, nonprofit organizations and federal agencies have begun to provide resources and research on addressing these issues, specifically within the Native American communities.

Northern Arizona University has great generalized resources when it comes to planning and adapting to climate change. (NAU, 2021) While the recommendations are not exact, it offers great guidance on what can be done to help prepare for climate change. Each region and culture will need to address their individual needs, but templates are available to address adaptation planning. There is a checklist that is similar to the public health framework. Many resources are listed to help inform those who choose to use the toolkit on many relevant issues.

A public health framework is needed to address many of the needs in forming and implementing solutions to health issues associated with climate change. The Mescalero Apache tribe has an informative case study on the US Climate Resilience Toolkit Website. (2021) They describe the actions taken so far to help with food security and the many effects of drought and water scarcity. Other tribes may benefit if they choose to view this example.

The 2020 Cares Act gave 5 million dollars to help tribes install temporary water stations and storage tanks. A more long-term award is needed to install and maintain more permanent solutions. The Cares Act money was not all invested in “needed infrastructure because of an arbitrary time limit on spending.” (Lakhani, 2021) Assistance from the government is needed, but has been lacking in many areas.

The CDC provides information on access to improved water sources. Storage is a key factor. Treatment of household water is another important factor. There are five ways to treat water: chlorination, flocculant/disinfectant powder, solar disinfection, ceramic filtration, and slow sand filtration. Cultural acceptability may influence which options may be used. Availability to sand that is appropriate for use will also influence the options. (CDC, 2014)

### **Conclusion**

Drought in New Mexico is currently in extreme state. In terms of environmental justice, addressing the impact of drought on the Navajo Nation needs to be a priority. The EPA has an existing policy on environmental justice for working with federally recognized tribes and indigenous peoples. This was drafted in 2014. One of the principles is that “The EPA works to understand definitions of human health and the environment from the perspective of federally recognized tribes, indigenous peoples throughout the United States, and others living in Indian country.” (EPA, 2014) There is a great deal more work that needs to be done. Federal, state, and local government agencies will need to work in cooperation with tribal government.

The government will need to step up and make better use of the limited amount of water we receive during the year, while giving priority to providing to the underserved and vulnerable populations in New Mexico.

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