

University of New Mexico

UNM Digital Repository

Climate Change and Public Health
Preparedness

Health Sciences Center Student Scholarship

12-2020

New Mexico: Land of the Drought

Brandi Davis

Follow this and additional works at: https://digitalrepository.unm.edu/hsc_climate

New Mexico: Land of the Drought

Brandi Davis

Concept in Climate Change & Public Health Preparedness

University of New Mexico

Part 1 Prompt:

An impact of climate change that we are experiencing in New Mexico is the dreaded drought. The drought is no stranger to New Mexico residents. It has been extremely apparent in the last couple of years. We've experienced less rainfall during the monsoon season, and less snowfall during the winter. New Mexico summers on the other hand have been hotter, began earlier, and lasted longer. As defined by David Gutzler, "The term drought refers to an extended period of below-normal precipitation, generally long enough to have pronounced effects on plants, rivers, or reservoirs" (Gutzler, 2003). As a result of drought, New Mexico continues to deal with the significant environmental predicaments of reduced reservoir levels, severe heat, and dried forest vegetation resulting in fires. The majority of New Mexico is classified as D3, which is "Extreme Drought". Extreme drought means fire danger is extreme, vegetation and native trees are dying, and crop yields are low. As mentioned in the Washington Post, "The soils have been sapped of moisture, with intense heat waves drying out vegetation even further, which has led to rampant and sometimes explosive wildfire growth" (Washington Post, 2020). New Mexico continues to face the harsh reality of severe heat and severe drought with less precipitation in the upcoming years. This is very unfortunate considering climactic changes have lasting effects that can become long-term.

Our climate is changing because the earth is warming. People have increased the amount of carbon dioxide in the air by 40 percent since the late 1700s (EPA, 2016). Greenhouse gases are increasing drastically and are playing a significant role in the drought. Many parts of the United States and the world are going to continue to deal with drought in the decades ahead. We need to understand that severe droughts are going to affect the agriculture, transportation, wildfires, and energy of the state. Our state needs to build resilience by beginning actions such as

conserving water, enhancing water efficiency throughout the land, water infrastructure, and identifying alternative water supplies available. Agriculture will be impacted by the increasing droughts and higher temperatures by interfering with local farms and cattle ranches. For the Native American population on the Navajo Nation, the rising temperatures and increasing drought will decrease the availability of fish, game, and wild plants the people have used for generations to survive the harsh dry environment of the reservations. Many also have to haul water from local wells to consume, and for agriculture. The changing climate we face is likely to increase, which in turn increases the need for water but also reduces the supply of current water reservoirs available. It is predicted that the annual rainfall is more likely to decrease than increase. As a result, drought is the most damaging environmental event because it results in water stress. Water stress ultimately affects agriculture, such as crops and livestock because they need water to grow. This will eventually lead to food insecurity especially for the Native Americans on the Navajo Nation.

Part 2 Prompt:

Food insecurity is a lack of consistent physical, social, and economic access to food daily for active and healthy life (Hunger Health, 2020). Food insecurity can be broken down into three aspects: 1. Food availability, 2. Food Access, and 3. Food utilization (Kriftcher, 2019). Food availability is having physical access to a food supply consistently. Food access is having the resources, financially, to obtain a sufficient amount of food. Food utilization is the proper biological use of food, which requires a diet that provides sufficient energy and essential nutrients. Drought is the main factor that contributes to food insecurity due to water stress but also includes population growth. By 2050, it has been estimated that the number of people at risk for hunger will increase by 20%. The drought on the Navajo Nation affects food availability,

food products such as crop yields, livestock, and fish production, and a reduction in affordable food products.

As the drought continues to persist, food insecurity in the Navajo Nation will result in malnutrition, chronic hunger, and low quality of overall health. As stated by Josh Merrill, "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. 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" (Merrill, 2013). The Navajo Reservation, which encompasses about 25,000 square miles of land in the Southwest is covered with one-third of sand dunes (U.S. Geological Survey, 2003). Dunes are an indicator of climate change, as mobilization depends on precipitation, soil-moisture balance, and wind patterns. The prolonged drought in the Southwest, as well as a regional drying across the Navajo Nation, causes the loss of vegetation which also holds consequences for the livestock that are raised by many Navajo members (Daniel Cordalis and Dean Suagee, 2008). Not only does the drought affect agriculture but also the health of the Navajo People. Research has shown that inadequate water conditions in tribal communities have been linked to a variety of health ailments, including cancer, kidney failure, reproductive health issues, skin rashes, and an elevated risk of developing diabetes (Felicia Mitchel, 2018). Drought poses many far-reaching health implications which can cause long-term public health problems including shortages of drinking water and poor-quality drinking water, impacts on air quality, sanitation and hygiene, food and nutrition, and more disease, such as West Nile Virus carried by mosquitoes breeding in stagnant water (CDC, 2020). Food insecurity is socio-economic, meaning it's both financial and cultural, and it focuses on having access to the right kind of food. The stress of the drought and food insecurity of the

Navajo People must be addressed because it can lead to mental health outcomes such as depression. This indicates the urgency needed to help this vulnerable population by managing the current climate crisis and alleviating the impact of climate change on food security.

Part 3 Prompt

As the drought in New Mexico continues to persist, the state needs to be prepared for an increase in water stress and food insecurity for the vulnerable populations. If the issue is continuously ignored, an increase in mental health issues is predicted to rise in Native Americans on the Navajo Nation. To combat the drought stress we are currently facing, the state specifically needs to come up with an action plan that includes: (1) drought plans, (2) monitoring, (3) declaration and response, (4) communication and coordination, (5) post-drought assessment, (6) impact and risk assessment, and (7) mitigation. According to Matthew Fontaine, Anne Steinemann, and Michael Hayes, "Drought plans are documents' that guide decision making before, during, and after a drought. They typically specify drought stages, indicators, triggers, and response" (Fontaine, Steinemann, and Hayes, 2014).

1. These drought plans would include guidelines, checklists that document steps taken, and drought-related responsibilities for state agencies. Specifically, the drought plans would be ranked from highest risk to lowest.
2. Drought monitoring would be used to identify the onset and recession of drought, which would also include the impact categories of agriculture, energy, fire, plants and wildlife, and water supply. This would ensure that vulnerable populations in the state are not deal with the issue of food insecurity.
3. Response strategies include: (1) increasing communication, (2) issuing water restrictions, (3) facilitating water transfers, (4) permitting temporary water rights, (5)

- issuing grants and loans to public water supply systems, (7) recommending federal drought concessions, and (8) activating state assistance and technical supports to state agricultural departments and agricultural stakeholders. Besides ensuring water is being distributed, food would also be allocated to avoid food insecurity.
4. Communication and coordination would have to begin between state and local governments, then to the stakeholders and the public. Communication would include press releases, public service announcements, issuance of drought advisories, and outreach to jurisdiction officials. The government must be monitoring drought conditions in rural communities and working with the residents to come up with actions to sustain an adequate environment to sustain water resources to prevent food insecurity.
 5. Post drought assessments will allow the state to examine the effectiveness of drought monitoring and response efforts. As stated by Fontaine, Steinemann, and Hayes, "Post drought assessments can be used to prioritize mitigation strategies based on the most recent drought impacts" (Fontaine et al., 2014). The drought in New Mexico is not likely to end soon, so it would be best to continuously evaluate and improve the program annually or every 6 months.
 6. Assessing the impacts and risks of the drought enables the state to identify vulnerable regions, such as the Navajo Nation. This would be beneficial because it would display locations where resources need to be allocated to reduce the impacts and to prioritize mitigation activities to reduce the risks of future droughts.
 7. Mitigation refers to the range of activities, performed in advance, to reduce the effects of drought (Fontaine, Steinemann, and Hayes, 2014). This could also include having

a full-time drought coordinator or having a diverse executive drought planning group that meets monthly to evaluate vulnerable regions within the state.

Part 4 Prompt

Mental health has been recognized as a major concern in the context of climate change. This is exceptionally true when climate change is a cascading effect. Specifically, in New Mexico, the drought stress on the Navajo Nation is affecting the communities' water resources which in turn affects the livestock and agriculture that are needed to survive the land of the drought. As stated by Jacqueline Middleton, Ashlee Cunsolo, Andria Jones-Bitton, Carlee Wright, and Sherille Harper, "The mental health impacts of climate change are amplified among certain populations, including those living in ecologically sensitive areas; those who rely closely on their environment for subsistence and livelihoods; those who already struggle with chronic health issues; and those experiencing ongoing systems of inequity, marginalization, and colonization, such as many Indigenous Peoples globally" (Middleton, Cunsolo, Jones-Bitton, Wright, and Harper, 2020). Mental health services must be offered and provided to the vulnerable populations in New Mexico to address issues that cause depression, anxiety, or grief. Providing education to vulnerable populations about the effects of climate change, specifically, the drought is an initial step to implementing change.

The State of New Mexico needs to work with the Navajo Nation to improve the public health of the Navajo's related to the severe drought conditions, which in turn affects the community's mental health. As I stated earlier, the public health department needs to engage in preparedness activities before the drought begins to affect the community. Weather patterns are constantly changing, which requires urgent action to save lives and the livelihood of the Navajo People. Below are urgent climate-positive actions the Navajo Nation will need to implement to

move toward "recovery" of climate change and its impacts to take toward overcoming the extreme conditions of the drought:

- Public Education
 - Water Supply Sources: A good start would be to categorize the supply sources into surface and groundwater. A map should be made into a brochure where groundwater wells are marked as safe drinking water locations. This will allow the Navajo People access to safe drinking water. Another option is to conserve water by building a reservoir in the community such as a dam, which would provide fish and wildlife habitat.
 - Effects of Drought on Soil/Sediment: The primary drought effect on soil and sediment is increased sheet erosion due to the loss of plant roots and wind. The loss of farm soil causes long-term loss in crop production, which will eventually lead to food insecurity. To decrease this issue, water canals or pipelines could be built to transport water from reservoirs and wells for irrigation and drinking water.
 - Effects of Drought on Surface and Ground Water Levels: According to Knutson, Hayes, and Phillips, "Rivers and lakes drop too low levels during drought, affecting fish habitat. Mountain animals have less to drink and migrate to wetter areas or places of water concentration. Groundwater levels drop, and spring flows decrease. Soil and moisture can decrease, killing even the deeper plant root systems" (Knutson, Hayes, and Phillips, 1998).
- Public Health and Safety
 - The drought affects human health, both physically and emotionally.

- Mental/Physical Stress: Drought situations lead to stress that can result in a variety of responses, such as anxiety, depression, loss of security, and mental health issues. There is an increased potential for serious emotional and mental health problems. Other social impacts include reductions in nutrition due to food insecurity. The Navajo people live in rural areas, which means they live in poverty. Many survive the land by growing crops and having livestock. The drought causes agriculture and livestock to diminish. A program needs to be implemented where food such as vegetables, grains, and meat can be distributed when the drought is severe causing unsustainable living environments. Another option would be having a local farm that is sustained year-round to distribute food to those in the Navajo Nation who are financially unstable. On this farm, rainwater containers could be built to provide water during severe droughts. This would be a community outreach program that would be implemented to support the Navajo people from deteriorating physical and mental health due to water stress, and food insecurity.
- Wildfire: Drought increases wildfire potential and can cause unpredictable fire behavior. Lack of water supplies during a drought can also make it difficult to fight wildfires, placing the lives of residents at risk. Wildfires also cause the vegetation to diminish, leaving the population at risk for food insecurity.

Climate change is an ongoing issue that is affecting the entire world in various ways. In New Mexico, we are faced with extreme heatwaves, which are causing a statewide drought. If we continue to receive significantly low precipitation, food insecurity and water resources will become unbearable for the people of the Navajo Nation. It is imperative that we continuously

support the vulnerable populations affected by climate change, so we can prevent the issues of water shortages, food insecurity, and rising mental health issues. By building resiliency, the public health system will become better equipped to provide services and support to all New Mexicans, especially the Native Americans who are dealing with the harsh effects of the drought.

References

- Center for Disease Control and Prevention (CDC). (2020). Health Implications of Drought. Retrieved from <https://www.cdc.gov/nceh/drought/implications.htm>
- Cordalis, D., & Suagee, D. (2008). The Effects of Climate Change on American Indian and Alaska Native Tribes. *Natural Resources & Environment*, 22(3), 45-49. Retrieved from <http://www.jstor.org/stable/40924927>
- Climate Prediction Center. National Weather Service. Retrieved from <https://www.cpc.ncep.noaa.gov/products/Drought/>
- Drought in western U.S. is biggest in years and predicted to worsen during winter months. (2020). *Washingtonpost.com*. Retrieved from <https://link.gale.com/apps/doc/A638878429/OVIC?u=albu78484&sid=OVIC&xid=d0eadb31>
- Fontaine, M. M., Steinemann, A. C., & Hayes, M. J. (2014). State Drought Programs and Plans: Survey of the Western United States. *Natural Hazards Review*, 15(1), 95-99. Retrieved from [https://doi.org/10.1061/\(ASCE\)NH.1527-6996.0000094](https://doi.org/10.1061/(ASCE)NH.1527-6996.0000094)
- Gutzler, David. Drought in New Mexico: History, Causes, and Future Prospects. (2003). Retrieved from https://digitalrepository.unm.edu/eps_fsp/3
- Hunger Health. (2020). What is Food Insecurity. Retrieved from <https://hungerandhealth.feedingamerica.org/understand-food-insecurity/>

- Kriftcher, C. M. (2019). What is food insecurity. Retrieved from <https://borgenproject.org/what-is-food-insecurity/>
- Knutson, C., Hayes, M., & Phillips, T. (1998). How to Reduce Drought Risk. Western Drought Coordination Council. Retrieved from <https://drought.unl.edu/archive/Documents/NDMC/Planning/risk.pdf>
- Merrill, J. (2013). Climate Change and its Effects on Indigenous Peoples of the Southwest. *American Indian Law Review*, 38(1), 225-259. Retrieved from <http://www.jstor.org/stable/24367736>
- Middleton, J., Cuncolo, A., Jones-Bitton, A., Wright, C. J., & Harper, S. L. (2020). Indigenous Mental Health is a Changing Climate: A Systematic Scoping Review of the Global Literature. *Environmental Research Letter*, 15(5). <https://doi.org/10.1088/1748-9326/ab68a9>
- Mitchell, F. M. (2018). "Water is Life": Using Photovoice to Document American Indian Perspectives on Water and Health. *Social Work Research*, 42(4), 277-289. Retrieved from <https://doi-org.libproxy.unm.edu/10.1093/swr/svy025>
- What Climate Change Means for New Mexico. (2016). Environmental Protection Agency. Retrieved from <https://19january2017snapshot.epa.gov/sites/production/files/2016-09/documents/climate-change-nm.pdf>