Oklahoma's Native American Population Surge will Increase their Future Flood Risk

Native Americans' future vulnerability to flooding is largely driven by population growth, not just climate change.

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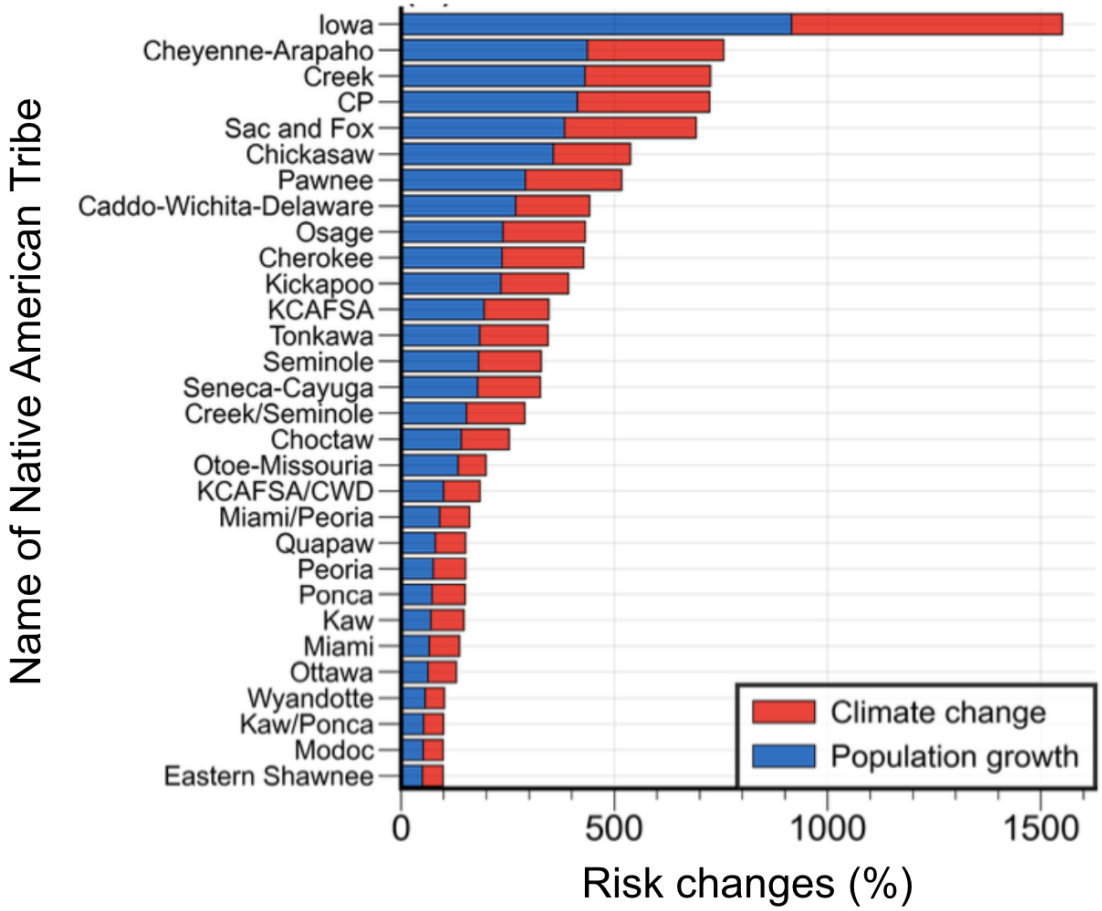
A recent study from the University of Oklahoma provided insight into how changes in Native American populations and human-induced climate change will greatly impact Native Americans' vulnerability to flooding[1]. While the study specifically focused on Native American populations in Oklahoma, the study's methodology could be applied anywhere, potentially foreshadowing how other minority groups could be impacted by these two variables. They found that Native Americans are five times more likely to experience flooding every other year compared to today. Their increased risk is largely driven by population growth rather than climate change.

Using climate models specific to the Midwest, they determined potential changes in flood frequency between 2000 - 2013 and 2071 - 2100. The study only analyzed flood heights that could happen once every two years (think the 100 year flood, but the 2 year flood instead) that resulted from 12 hours' worth of rainfall. They further studied projected changes in Oklahoma Native American populations, which are expected to increase from about 280,000 (roughly the population of Madison, Wisconsin[2]) to about 600,000 (roughly the population of Las Vegas, Nevada[3]). To determine a group's susceptibility to a risk, social scientists combine factors like income, ages of household members, English fluency, housing type, and transportation to access their social vulnerability index or SVI. The SVI determines how quickly a community can respond and recover from a disaster, like flooding. Changes in Native American populations will lead to changes in SVI, so by calculating future SVI values, you can understand future risks and vulnerabilities to flooding.

The researchers ran four simulations: one with the Native Americans 2013 population and the Earth's 2013 climate, one with the 2013 population and 2100 climate, one with the 2100 population and 2013 climate, and one with the 2100 population and climate. By separating the old and future populations and climates, they were able to determine which factor increased the Native Americans SVI the most. They found that population growth had a greater impact in Native American's vulnerability to flooding than climate change. While not explicitly stating in the study why that is, one can imagine that the greater the population, the more elders and children, people with disabilities or those with health concerns there are. This decreases a population's ability to quickly respond to and recover from something like flooding as evacuating these groups may be harder.



The figure shows how changes in population growth and climate change will increase the risk of different Native American tribes in Oklahoma. The risk is calculated based on factors including but not limited to where the tribes live, their income, ages of household members, English fluency, housing type, and access to transportation. The percent increase of risk is shown on the x-axis, where a 500% risk makes them 5x more likely to experience flooding in a two year time period in 2100 compared to 2013.

Of course, climate change cannot be discarded. Compared to the control simulation, the once two year flood is expected to occur five times more frequently, making it the future one in five month flood. The compound impacts of population growth and climate change will significantly impact Native Americans ability to maintain and care for the land they have lived on for hundreds of years. The authors of the study stressed the importance of integrating Native Americans' knowledge of their land into state-led climate adaptation and mitigation efforts. Native Americans' knowledge often spans back longer than records the National Weather Service has and is in finer detail, facilitating tailored solutions that will work for them that may not work elsewhere, like in Oklahoma City.

The study leaves questions into how other Native American populations and others who live in low-income communities or in floodplains will be impacted by the combined effects of population growth and climate change. With flooding becoming more frequent, groups from all backgrounds will have to come together to make a game plan to keep their respective populations safe during flooding and be able to bounce back from flood events. Rather than wait for more studies like this to be done in different areas of the United States, these conversations need to start happening now so they have as much time as possible to prepare.

References

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