Climate Change Impacts on Drinking Water Resources

Drinking water resources stressed by climate change will be further impacted by a growing population in many areas of the state, including the Haw River watershed. Historical data for North Carolina indicate that precipitation has become more variable, stream flows are decreasing in many areas, and drought frequency may increase due to extreme heat. An increase in droughts, and higher demands from an increasing population, could compromise stream ecology, threaten water supply reliability and quality. The state's worst ever drought in 2007 led to water restrictions in municipalities; some had less than a 100-day supply of water available.

Many municipal and industrial water supplies in the Piedmont of North Carolina use surface waters, impounded in reservoirs as their primary source. Low stream flows and lake levels resulting from drought can result in poor water quality. At the same time heavier rainfall events bring more pollutants into surface waters from stormwater runoff, particularly nutrients. These have been shown to contribute to water quality impairments in water supply reservoirs, such as Jordan Lake, including increased algae growth. Poor water quality can contribute to negative health impacts, and increased cost of water treatment. Jordan Lake is the source of drinking water to over 300,000 people in the Haw River watershed.

In addition to higher costs for treating drinking water, many of these public systems face lower revenue from customers who conserve water when there are shortages caused by droughts. In some rural communities, populations are decreasing, with fewer people to support the cost of clean drinking water, In either case, costs for maintenance and new construction are passed on to customers, with a greater burden on low-income residents. Looking ahead, these systems will need significant resources to address these concerns. Aging infrastructure, including distribution lines and dams, are increasing the stress on our state's water resources.

Private and public drinking water from wells is also under threat from climate change, as the water table drops due to greater water usage or during drought. The recharge process of water entering and being stored in the ground will be impacted if warming affects the amount, or when rainfall comes in heavy storms that run off the land, instead of being absorbed. The recharge process can also be impacted by land-use change, such as loss of forests and new impervious surfaces. Groundwater impacts were not addressed in the two state reports, but it is an important issue for many residents of NC.

Water management during droughts is coordinated by the NC Division of Water Resources and the North Carolina Drought Management Advisory Council. Federally owned and licensed dams such as Jordan Lake have protocols in place to manage reservoirs during high water and drought events. The state also requires local governments and large community water systems to have a Water Shortage Response Plan in place that specifies water restriction levels and conservation efforts based on reservoir or stream levels. The state also encourages resiliency efforts such as interconnections and regionalization to provide emergency water supplies.

We can't wait for the next drought to make sure these plans are adequate. They need to be updated now to reflect the best data for climate impacts. New ideas are needed for how drinking

water is paid for, so that there is not a conflict between water conservation measures and financing treatment plants and maintaining infrastructure.