

# **Water Justice in an Era of Climate Change**

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### **Introduction**

Climate change is already upon us, and some environmental injustices, including access to safe and affordable water, will be worsened as it progresses. Some mark the arrival of Hurricane Irene in the fall of 2013 as a turning point when communities up and down the east coast realized the severity of the climate situation, but, for North Carolina residents, Hurricane Floyd in 1999, with its 22 inch rainfall and severe flooding over large parts of eastern NC, may be the point at which many in NC were awakened to the disparities in impacts caused by extreme weather events. That far back, many of us may not have associated weather extremes with climate change, but we saw flooding from this huge storm event deluge low income communities, often communities of color, located in low lying areas. Thousands lost homes, water supplies and workplaces, but state and local officials got very limited federal funding to assist victims of this large regional disaster. Many of those residents, particularly those whose rental homes were destroyed and received no insurance payments, were living in cramped temporary housing for up to a decade. Rural residents whose water supply wells had been covered by contaminated water during the extended flooding had to drill new wells or seek local government assistance to get line extensions for public water and sewer. The net result of the storm was to deepen and prolong the disempowerment of already disadvantaged residents. In a few cases, "Build Back Better" collaborative projects with housing and energy non-profits resulted in construction of new, energy efficient replacement homes, a trend that could have been scaled up to help a significant number of displaced residents, but rural, marginalized communities and local governments faced steep challenges in advocating for state or federal aid.

What is climate justice and what does it mean for protecting safe, affordable water for all in North Carolina? According to the group Act for Climate Justice, "Climate justice is a vision to dissolve

and alleviate the unequal burdens created by climate change. As a form of environmental justice, climate justice is the fair treatment of all people and freedom from discrimination with the creation of policies and projects that address climate change and the systems that create climate change and perpetuate discrimination.”<sup>1</sup> In North Carolina, as in all over the globe, rural communities, poor communities, and communities of color are likely to be most vulnerable to the effects of climate change. Their homes, health, livelihoods, and community services are the most threatened, so local governments must take steps to ensure that ALL communities have the necessary tools to be “resilient” in the face of coming changes. In this report, climate justice will be considered in terms of how it affects communities’ ability to ensure water justice.

How do we work toward water justice? Now that we are in the “now” rather than “if” era of climate disruption, the term *resiliency* has increasingly emerged as the concept under which state and local governments need to be planning for sustainable community services, including water and wastewater. How can communities prepare for when it becomes “their turn” to face floods, droughts, competition for water resources, sea level rise, and other likely impacts of climate change? How will they endure *and* bounce back?

North Carolina’s location and topography make this state particularly vulnerable to extreme weather events, so state and local governments must plan so that all of our communities, especially the most vulnerable, are resilient. In the language of climate justice, these particularly vulnerable populations are called “frontline communities” and are most likely to include indigenous people, people of color, and poor to working class residents. Building resilience in frontline communities is especially important because they are the least able to expend personal resources to get out of harm’s way or reinforce their communities to protect themselves in place. They also have less access to health services and fewer resources for replacing or repairing homes, water supplies and other infrastructure. Climate

change is a problem created by all of us, so it is particularly unjust to expect already disadvantaged communities to bear a disproportionate share of the adverse effects.

### **What are communities facing?**

Preparing for the extreme events that climate change brings is more difficult because current predictive models are not able to accurately simulate weather patterns – past or future – specific to the southeastern United States.<sup>2</sup> What we do know, however, is that the weather events we already deal with in North Carolina – periodic but extreme drought, hurricanes, winter storms, storm related flooding – are generally becoming more intense and devastating due to warming oceans and increased moisture in the atmosphere. To create more resilient communities, state and local governments can prepare for the same types of events they previously have, but preparation, mitigation, and recovery will be more challenging and costly as more intense and extended storms, droughts and winds become the norm.

The EPA predicts that drinking and wastewater water utilities in the southeast region will be forced to contend with numerous issues including: higher temperatures that intensify evaporation; groundwater stores and lakes, ponds and wetlands that do not recharge as frequently due to longer, more severe droughts; saltwater intrusion into shallow aquifers; increased salinity of estuaries, wetlands and tidal rivers along the coast; and declining water quality in streams, lakes, and other sources of drinking water.<sup>3</sup> All of these issues are compounded for the highest poverty areas and even for pockets of poverty surrounded by areas of general wealth, such as those found on the coast and other high-tourist areas.

Poverty in North Carolina has been persistent in the rural and eastern parts of the state.<sup>4</sup> The counties in the eastern third of the state are at greatest risk to be inundated by flooding during hurricanes and to experience drinking water contamination from occasional flood events or rising sea level. Yet these largely rural counties do not tell the whole story of vulnerable communities in North Carolina. When the state is examined by census tract, 106 out of 162 (65%) of the most economically

distressed tracts are located in urban areas.<sup>5</sup> In these pockets of high-level urban distress is ten percent greater than that of rural distressed tracts.<sup>6</sup> Any price increases based on climate change-related scarcity will present additional hurdles to these vulnerable communities.

What would water justice look like under these conditions? Policies must be implemented at the state and local level that protect and prepare our state for these new environmental conditions, and mitigate the effects of extreme weather for vulnerable populations, wherever they exist. Many of the necessary infrastructure improvements and policy changes are likely to be costly, so policymakers must plan distribution of costs over time and among customers to ensure that services remain affordable to financially strapped residents while making sure appropriate infrastructure reaches them.

### **Water Availability and Cost**

Clean Water for North Carolina supports the United Nation's position, in accord with widespread public opinion, that water is a human right.<sup>7</sup> Therefore, making water unavailable to anyone due to contamination, scarcity, or high pricing must be treated as a violation of that right. We believe the best way to ensure water justice is through government owned and operated systems rather than private, profit-seeking entities, so that is what we refer to here.

Climate change can affect the availability of drinking water by drought or contamination due to flooding or stresses to water and wastewater infrastructure. Though the timing of these events is unpredictable, we do know they will test both infrastructure and capacity. Shortages lead to disputes over both the ownership of water and the prioritization of conflicting uses. The biggest users in North Carolina – big agriculture and the energy industry – have the benefits of no limits or charges for water withdrawals<sup>8</sup> and powerful influence on lawmakers in Raleigh. This results in little incentive for those largest users to conserve, and little desire for lawmakers to implement limits or withdrawal fees. Water quality is also affected by extreme weather by way of flooding, storm water runoff, and saltwater contamination. This increases the likelihood of residential users facing rising costs for water due to

scarcity and/or the treatment costs of contaminated water. Even under “normal” conditions, municipal and county water systems struggle to make up for the cost of upkeep and treatment through residential rates<sup>9</sup>, despite the fact that rate setting for water and sewer very often neglects affordability for the most vulnerable residents. There is a need for more accurate affordability criteria, and for those criteria to be targeted for the benefit of low-income users, rather than averaged over a whole system or geographic area.

From the 2011 report “Privatizing Water, Undermining Justice”:

“The U.S. Environmental Protection Agency has proposed an affordability threshold based on the percent of median household income which goes toward water. Generally, EPA has determined that water is unaffordable when it exceeds 2.5% of median household income (not including wastewater charges), although other policy groups have insisted that combined water and wastewater bills should not exceed 2% of household income. Whatever the standard of affordability, the cost of water takes a higher toll on some residents simply due to their lower incomes, and people of color are likely to spend a higher portion of their income on water and sewer services because of social and housing disadvantages.”<sup>10</sup>

Clean Water for NC recommends that water suppliers in our state adopt increasing block rate structures to promote conservation and require that larger users, such as profitable industries, pay higher volumetric rates, rather than the discounted rates currently charged by many water utilities. While lower income residents generally use smaller volumes of water than wealthier households, their home pipes and fixtures are likely to be older and leakier,<sup>11</sup> so the metered amount for which they are billed can be quite large, in some cases putting them in a higher water rate brackets –for water that leaks out before they can even use it! The implementation of increasing block structures also requires that utilities periodically check water supply lines and fixtures for leaks to make sure that users are not paying for water that is leaking out of the pipes.

A recent New York Times op-ed focused on the cheap price of water and the ill-conceived pricing methods that are used by many water suppliers.<sup>12</sup> Municipal systems are faced with a conundrum – how to keep water prices low enough to be affordable to all users, but high enough that systems can do the necessary infrastructure upkeep and improvements. Many systems are not charging enough to keep up with maintenance and prepare for future needs, and some are even operating their

water and wastewater utilities at a loss. While local governments may set low rates with the intention of subsidizing economic local businesses and growth, it can also allow infrastructure to decay, and incurring debt that may lead to default or vulnerability to privatization.<sup>13</sup>

When cash strapped local governments find they are unable to keep rates reasonable and maintain their infrastructure, they may turn to full or partial privatization of the water system to raise capital,<sup>14</sup> allowing the new system owner to set water and/or sewer rates. Privately owned systems are likely to create even more disparities to vulnerable residents in the form of higher rates, less accountable contract service personnel, and by preventing public participation in water system policy decisions. Once a private for-profit company has control of a water supply, they will try to sell the water in the way that is the most profitable, rather than focusing on meeting public needs. For example, Aqua America built a pipeline to supply fresh water to an energy corporation for use in fracking the Marcellus Shale in Pennsylvania<sup>15</sup>. If industry is given priority for water use over residential users, this puts pressure on local water supplies at the expense of individuals who *have a right to drinking water*.

## **Sea Level Rise**

The most readily accessible image that springs to mind when contemplating sea level rise is that of inundated coastal communities. Projections show that North Carolina coastal communities will see the Atlantic rise from 1 to 5 feet.

Residents of Eastern North Carolina are already experiencing the effects of saltwater intrusion. As seawater seeps ever farther inland, it threatens soil and water supplies. This problem is accelerated when aquifers are depleted through over-pumping by agriculture or industry. For example, in the Pamlico River region, PCS Phosphate, a huge mining operation, has been pumping tens of millions of gallons freshwater out of the Castle Hayne Aquifer *every day* since the 1960s! Not only did this threaten to dry up private and community wells across the region through dropping groundwater levels, as the

aquifer cannot replenish itself fast enough to keep up, the depleted aquifer becomes increasingly vulnerable to saltwater intrusion.<sup>16</sup>

Miami and other coastal cities already experience flooded streets during the highest tides. As devastating as that “new normal” will be to lifestyles and property, another result could be equally or more destructive – the intrusion of saltwater into fresh water supplies. As sea levels rise, they will inevitably contaminate aquifers, surface waters, and private and public water supply wells. Do local governments have the ability and capacity to develop infrastructure improvements to prevent this contamination? Once local sources become contaminated, what is the backup plan? Desalinization is expensive and energy intensive, as is bringing in water from outside sources via trucks or pipelines. In times of drought, municipal systems cannot take it for granted that they will be able to buy water from a neighboring system, as every public system is likely to provide for its own users first.

Comedy shows and pundits had a field day when the North Carolina state legislators made it policy not to acknowledge sea level rise on the North Carolina coast beyond a 30 year forecast, rather than the original 100 year--much more devastating--predictions. But local officials and the coastal real estate lobby asked for this from their representatives because they feared the dire predictions would collapse the tourism industry and continued development on which the coastal areas have depended.<sup>17</sup> This presents quite a predicament. Formally acknowledging the inevitable ocean rise will have serious economic consequences, but so will ignoring it. And it will not be the owners of the vacation rentals who suffer the worst effects of a damaged tourism economy, but those permanent residents in low wage jobs, such as waiting tables and cleaning the beach houses<sup>18</sup>. It is hard to see how this form of short-term denial is an effective or responsible long-term solution that responds to the needs of the service workers and other vulnerable residents.

## **Drought**

Competition for water is likely to increase as people and businesses from drought-stricken areas see North Carolina as a place where water is currently plentiful. That may be true at this time, but our state will no doubt have major droughts in the future, as we have in the recent past. Even within the state, wealthier communities experiencing scarcity will be better able to pay for repairs and pipelines to access water supplies from other suppliers. North Carolina's most recent experience with extreme drought came in 2007, when municipal systems all over the state experienced historic low stream flows and reservoir levels in their water sources. Reprieve came just as many municipalities were almost forced to truck in water from other sources. Did local governments learn from that experience? North Carolina is becoming more susceptible to water scarcity as our population and demand on water supply increase, even while climate change is making us more vulnerable to prolonged droughts. Some municipalities have continued to invest in infrastructure improvements to prevent water losses and increase water efficiency for public uses and private business and industry. Many others have failed to do so, either by lack of foresight for policy development or because they lack the tax base to leverage expensive system upgrades. And reservoir expansion is not a sustainable solution for drought planning. These large, open basins of water lose millions of gallons per day of moisture to evaporation, create new sources of climate changing methane releases from sediments, and prevent water from reaching downstream residents, businesses and aquatic life. The conservation of groundwater, which is much less subject to evaporation and naturally filtered for most contaminants, should be paramount.

How can local governments respond and prepare? During the 1990 to 2002 drought, localities suffering from low water levels had varying responses. For example, Statesville, NC, in the Yadkin River Basin waited so long to implement conservation requirements they ended up with only 9 days of supply before they sought emergency permitting for a new small reservoir—then rains brought relief. Conversely, Concord – which is in the same river basin and relies solely on surface collection ponds –



saw the writing on the wall in 2001 and implemented community-wide, diverse water conservation measures that both helped see the town through the drought and created broader public understanding of the need for conservation.<sup>19</sup> Concord implemented mandatory restrictions on both business and residences, limited growth based on water supply, and engaged in community education efforts on water conservation.

In 2003, the state Drought Management Advisory Commission began providing drought status data to local governments to enable better water management. Despite that, when an extreme drought hit in 2007 – “drought conditions in the state went from normal to record drought in less than a year”<sup>20</sup> – numerous local governments were scrambling to construct new water lines, trucking in water from other systems, and generally panicking as systems dropped to less than 100 days of supply. Rather than acting only in drought conditions, a water justice orientation would guide local governments to implement measures such as the ones Concord used as every day policy moving forward, creating a culture of conservation that would reduce the intensity of drought emergencies and keep water more abundant to more users on an everyday basis.

## **Flood**

In addition to sea level rise, climate change also brings stronger storms that are already resulting in dramatic flooding of inland land and waterways. The surge and torrential rain from Hurricane Floyd caused rivers and streams to overflow their banks quickly, creating a toxic soup of dead livestock, raw sewage, pesticides, and hog waste flowing across the eastern part of the state, North Carolina’s most impoverished region. This new era of stronger, wetter storms creates an enormous storm water runoff problem – with pollutants washed over impervious surfaces and into drinking water supplies. Floyd was “only” a category 2 hurricane when it made landfall, but it brought large amounts of rain right on the heels of another tropical system that had left the ground saturated. This isn’t a purely eastern North Carolina problem though. During a particularly wet period in the summer of 2013, about 30 residences

in a Carrboro mobile home park were condemned after torrential rain pulled out propane tanks and sent raw sewage flowing through the park<sup>21</sup>. Western North Carolina is not immune to the dangers of flooding, despite the often steep terrain. In 2004 Hurricanes Frances and Ivan hit 9 days apart, with floodwaters sweeping away homes, mobile parks, and 11 lives. The emergency response teams of that region, being much less accustomed to such extreme flooding, found that their flood warning systems and response plans were inadequate for a disaster of this magnitude.<sup>22</sup> Unlike their counterparts in the eastern part of the state, local government staff in these western counties were inexperienced in writing grants for recovery funds, which deepened and lengthened the flood's effects.

As local governments have come to acknowledge the inevitable damage flooding can cause in terms of pollutants in storm water runoff, many localities are implementing or planning storm water fees. These fees must be implemented with careful consideration to avoid unintended consequences that may push out lower-income residents. There are several approaches to implementing storm water fees: a flat fee – typically one rate for residential properties and a higher rate for other users, a fee based on amount of impervious surface on each property, or a fee that is levied as part of property taxes (which of course means tax-exempt properties pay no fee).<sup>23</sup>

## **Energy**

North Carolina still relies primarily on coal and nuclear power plants for producing electricity grid. North Carolina's coal and nuclear plants withdraw up to 9.1 billion gallons per day and return much of it hot and chemically contaminated. Natural gas is also a water intensive form of providing energy and Duke Energy is seeking to increase gas fired power production. Duke has shown little to no interest in transitioning to less water-intensive, decentralized alternatives (solar and wind both use little to no water to generate electricity). The use of water in energy production is critical because it is a heavy, dirty user that is integral to the climate change producing cycle. Water is used in the extraction and transportation of coal, the extraction of natural gas, and for cooling during electricity production in

coal and nuclear plants. Coal and natural gas fired electricity then produces emissions, which disrupt the natural global climate cycle. It defies logic to use so much water to produce dirty energy that in turn exacerbates climate conditions that contribute to water scarcity.

Utility companies have shown little interest or even outright hostility to attempts to move toward cleaner, less water intensive energy production. Duke Energy, in particular, has made it impossible even for solar users hooked in through net metering to produce more than an arbitrarily set number of kilowatts. Why? Because if electricity users begin generating “too much” electricity via wind or solar, the financial model for centralized power plants falls apart. This should be Duke Energy’s problem, not the problem of those who wish to build their own systems, especially when there are possibilities to bring renewable forms of power generation to socioeconomically disadvantaged communities. The heavy doses of water required for fossil fuel-fired energy production are a hidden cost, contributing to the scarcity of freshwater and rising prices. Vulnerable communities then get gouged by both their water AND electric bills! With North Carolina state government rushing to open the state to fracking, yet another fossil fuel industry add to the water withdrawals could result in increased prices and privatization of supplies and infrastructure.

## **Agriculture**

Agriculture is by far the biggest user of water, and North Carolina has no system of permitting for water withdrawals at all, the only state in the region lacking such a policy. The current cheap availability of water for irrigation and livestock care has given agricultural producers little incentive to conserve water and change farming practices. This must change if communities are to foster resiliency and maintain plentiful and affordable drinking water and food supplies. Requirement of low evaporation irrigation systems and closed livestock watering systems, as well as a permitting structure implemented at the state level with limits on withdrawals, and higher rates for larger, less efficient operations would incentivize farms to use less water.

A growing sustainable agriculture movement is being embraced by more and more communities across the state. To date, the local, sustainable foods movement primarily thrives in more affluent areas that more easily support the small, family farms with their very thin margin of profit. Yet as the food justice movement gains traction, these sustainable, less water-intensive farming methods are being supported in less affluent areas as well, for social benefits as well as sustainability. For example, the group <http://growingchange.org/> is comprised of young men who were otherwise headed for juvenile detention but are now working a sustainable farm located at a closed prison in Scotland County that had been abandoned. This small farm provides food for nine local families in need, and the group was approved in the fall of 2014 to expand their program to another closed prison. This is the type of creative thinking needed in our food system and that state and local government need to find ways to support. Sustainable farming has the triple benefit of supporting small farms, using less water and helping prevent price increases resulting from scarcity.

### **Climate Change, Water Justice**

The fight for the right of all people, regardless of income or other social status, to have access to clean and affordable water has been ongoing for generations. The advent of climate change only complicates and magnifies the need for all of us to take part in those efforts. Frontline communities, communities of color, and low-income communities are the most vulnerable to the effects of climate disruption-induced water scarcity and high prices. Though when and where in the state these events will happen cannot be known, state and local governments must be aware they will happen, and in some cases *are already* happening. It is their responsibility to ensure access to safe drinking water for all those residing within our state's borders. The question is: will we be adequately prepared to protect access to water of our most vulnerable populations? The time to plan and act is now.

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<sup>1</sup> <http://www.actforclimatejustice.org/about/what-is-climate-justice/>

<sup>2</sup> State Climate Office of North Carolina, "Climate Change In North Carolina", NC State University, [http://www.nc-climate.ncsu.edu/climate/climate\\_change#Future](http://www.nc-climate.ncsu.edu/climate/climate_change#Future)

<sup>3</sup> <http://water.epa.gov/infrastructure/watersecurity/climate/upload/epa817k11003.pdf>

<sup>4</sup> <http://www.ncjustice.org/?q=budget-and-tax/infographic-poverty-and-people-north-carolina>

<sup>5</sup> Serkin, Aaron and Stephen Whitlow, "The State of North Carolina Urban Distressed Communities", 2005, prepared for the North Carolina Metropolitan Mayors Coalition.

<sup>6</sup> <https://curs.unc.edu/files/2014/02/NC-Distress-Update-final.pdf>

<sup>7</sup> United Nations, "General Assembly declares access to clean water and sanitation is a human right," UN News Center, July 28, 2010, <http://www.un.org/apps/news/story.asp?NewsID=35456&Cr=SANITATION &Cr1=.ç>

<sup>8</sup> [http://www.ncwater.org/Rules\\_Policies\\_and\\_Regulations/Regulation/GS143-215.22H.pdf](http://www.ncwater.org/Rules_Policies_and_Regulations/Regulation/GS143-215.22H.pdf)

<sup>9</sup>

<http://www.efc.sog.unc.edu/sites/www.efc.sog.unc.edu/files/NCLM%20EFC%20Annual%20W%26WW%20Rates%20Report%20-%202014.pdf>

<sup>10</sup> Hicks, Katie, Hope Taylor, and Siying Zhang, "Privatizing North Carolina's Water, Undermining Justice". Clean Water for North Carolina. 2011

<sup>11</sup> <http://yosemite.epa.gov/opa/admpress.nsf/0/F72C2FDC7D61F92085257B800057655F>

<sup>12</sup> [http://www.nytimes.com/2014/10/15/business/economy/the-price-of-water-is-too-low.html?\\_r=4](http://www.nytimes.com/2014/10/15/business/economy/the-price-of-water-is-too-low.html?_r=4)

<sup>13</sup> Shadi Eskaf, David Tucker, Jacob Mouw, and Chris Nida. "Annual Report of Water and Wastewater Rates and Rate Structures in North Carolina - January 2014". UNC School of Government.

<sup>14</sup> <http://www.foodandwaterwatch.org/reports/borrowing-trouble-water-privatization-is-a-false-solution-for-municipal-budget-shortfalls/>

<sup>15</sup> <https://www.aquaamerica.com/about-aqua/shale.aspx>

<sup>16</sup> Clean Water for North Carolina, "Clean Currents", Spring, 2008, pp 1.

<sup>17</sup> [http://www.washingtonpost.com/business/economy/ncs-outer-banks-got-a-scary-forecast-about-climate-change-so/2014/06/24/0042cf96-f6f3-11e3-a3a5-42be35962a52\\_story.html](http://www.washingtonpost.com/business/economy/ncs-outer-banks-got-a-scary-forecast-about-climate-change-so/2014/06/24/0042cf96-f6f3-11e3-a3a5-42be35962a52_story.html)

<sup>18</sup> [http://www.washingtonpost.com/business/economy/ncs-outer-banks-got-a-scary-forecast-about-climate-change-so/2014/06/24/0042cf96-f6f3-11e3-a3a5-42be35962a52\\_story.html](http://www.washingtonpost.com/business/economy/ncs-outer-banks-got-a-scary-forecast-about-climate-change-so/2014/06/24/0042cf96-f6f3-11e3-a3a5-42be35962a52_story.html)

<sup>19</sup> "A Fairly Watered State"

<sup>20</sup> DMAC Annual Report [http://www.ncdrought.org/documents/2008\\_annual\\_report.pdf](http://www.ncdrought.org/documents/2008_annual_report.pdf)

<sup>21</sup> <http://www.wncn.com/story/22736029/stunned-carrboro-chapel-hill-residents-pick-through-flood-damage>

<sup>22</sup> <http://www.citizen-times.com/story/news/local/2014/09/06/hurricanes-frances-ivan-impact-lingers-years-later/15217637/>

<sup>23</sup> <http://water.epa.gov/infrastructure/greeninfrastructure/upload/FundingStormwater.pdf>