

Preventing “Watershed Sprawl” at Mountain Island Lake, North Carolina

By Michael S. Tomczyk

For countless centuries, water has been treated by humans as a virtually unlimited consumable resource replenished by rainwater, groundwater and snowmelt—contained in lakes, reservoirs, rivers and streams. The truth is, water is a *limited* resource. These precious water resources are increasingly threatened by “sprawl” which means in general that land is being consumed at a faster rate than the rate of population growth in a region¹ and in the context of “water” it means that land is developed faster than available water supplies can accommodate the increasing land use.

Water Under Pressure: Early Signals. In the U.S., at least 36 states are expected to face water shortages in the next five years, according to U.S. government estimates.² Many cities and towns face dire consequences if lakes, rivers and streams are not protected, especially from shoreline land development. Water, like any other resource, needs to be sustainable. We can’t soak it up indiscriminately now and then complain later, “why are we so thirsty?”

There are many examples of what happens to cities when water is not properly protected and budgeted. In May 2008, Barcelona, Spain had to import a tanker of water—5 million gallons—to meet the city’s water needs. There is a 50 percent probability that Lake Mead, the largest man-made lake and reservoir in the U.S. will run dry by 2021 if usage is not reduced.³ Most people know that Atlanta’s water supply is in crisis, but water shortages extend throughout the Southeastern U.S.—including such states as North Carolina which has traditionally had an ample water supply. Many of these water shortages are attributable to decision makers who did not consider the finite availability of water, nor take into account the reality that expanding communities increase water use, often beyond the ability of the aquifer to sustain itself.

The Drought Factor. Water is an especially “hot topic” due to the current drought conditions in many regions of the country. Recently, the “drought scores” of many states, regions and cities have reached unprecedented levels, due to many factors including over-development. The website www.DroughtScore.com lists the “drought score” for American states and cities. The state of North Carolina has a score of 117.7 which is described as “severe drought”—alarmingly close to the highest rating (over 120) which is “extreme drought.”

Drought conditions are exacerbated by urban and suburban developments that divert rainwater that is needed to recharge groundwater. A seminal report by American Rivers in 2002 examined the nation’s fastest-sprawling cities and calculated how much groundwater infiltration was being lost each year due to development.⁴ Topping the list was Atlanta, which developed over 600,000 acres and lost the most groundwater (132 billion gallons a year).

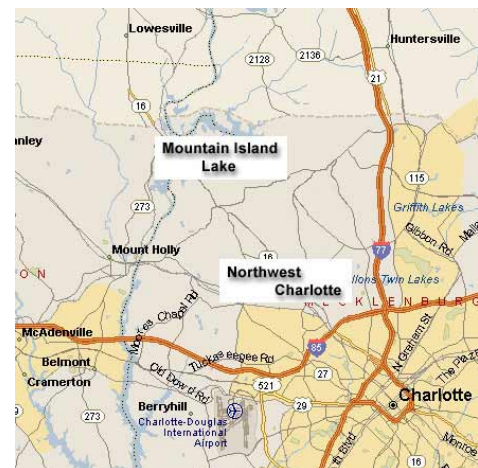
Urban and suburban developments exacerbate droughts through unregulated water use, overuse, and some factors that are not obvious. For example, one interesting factoid I came across in my research describes how “impervious surfaces” in a typical suburban development can divert over 40 million gallons of water—especially stormwater—away from underground aquifers annually. These surfaces include asphalt and concrete roads, streets, buildings and similar man-made “improvements.” These surfaces limit ground penetration and redirect the runoff of rainwater which also hastens the washoff of fertilizers and other pollutants into waterways, and blocks the “recharge” of groundwater systems. Billions of gallons of water each year can be diverted in this way, in just one city.

Preventing “Watershed Sprawl”. An especially high impact type of sprawl involves development along the shores of a lake, river or stream. If I may be allowed to coin a term, I would call this “*watershed sprawl*”—which, for the purpose of this paper, I will define as “*the uncontrolled development of shorelines and adjacent areas affecting lakes and reservoirs, rivers and streams.*”

Watershed sprawl can pressure a water source in many ways—by polluting our drinking water with a variety of chemicals, diminishing groundwater, and causing water shortages from overuse of reservoirs. One way to combat watershed sprawl is to control shoreline development projects. Fortunately, some communities are beginning to do this—by taking vigorous and effective steps to protect lands adjacent to lakes, rivers and reservoirs, and the streams that feed them. One such example is Mountain Island Lake, North Carolina.

Mountain Island Lake, NC. Mountain Island Lake is a 3,200 acre lake with 60 miles of shoreline, that is the primary water supply for more than 725,000 people in and around Charlotte, North Carolina. About 72 percent lies in Charlotte and Mecklenburg Counties, and in the towns of Gastonia and Mount Holly, in Gaston County. The watershed was created in 1924 when Duke Power Company dammed part of the Catawba River. In the 1990s it was a largely unspoiled lake not yet affected by “sprawl.”

Mountain Island Lake is known for its pristine appearance and clear water (*see photo*). The lake produces unusually pure drinking water due to the fact that nearby Lake Norman captures most of the sediment from the Catawba River. As a result, water from the lake is so pure, it substantially reduces water treatment costs for area



municipalities. When the nearby community of Gastonia relocated its water intake from a polluted branch of the Catawba River in 1995, they cut their water treatment costs in half. Gastonia has a unique appreciation for water since they had previously faced a serious eight-month long drought and water shortage in 1986 which caused them to reassess the sustainability of their water supply.

In the 1990s, the entire region was threatened by the specter of unbridled land development, which alarmed local leaders—several area lakes had already succumbed to high levels of sediment and contamination from fecal coliform bacteria which made their water unfit for human consumption, or expensive to treat. If development was allowed to proceed, the region would lose a scenic reservoir, water quality would be threatened and water treatment costs would rise.

In the mid-1990s, the surrounding cities and counties—led by a three-county coalition of community leaders, benefactors, concerned citizens and organizations—took aggressive action to prevent developers from encroaching on their lake. The examples of what they did read like a how-to menu of ideas for preserving lake and stream shorelines:



- In the mid-1990s, the Charlotte-Mecklenburg Utilities began making annual land acquisitions with the purchase of more than 2,700 acres for parks and green areas, funded by a \$20 million bond package. Trusts and conservancies were established.
- In 1996, the County Board of Commissioners extended conservation policies to creeks as well as lakes. They developed the Surface Water Improvement and Management (S.W.I.M.) Program with a goal to make all surface waters fishable and swimmable—which was bold—at the time, only 15 percent of the county’s creeks met those criteria.
- Fecal coliform was reduced 70 percent, through reduced sewer discharges, decreased sediment, and tighter inspection and erosion control—especially at construction sites.
- In 1997 the Foundation for the Carolinas recruited group of partners to create and implement a plan to protect the watershed known as the Mountain Island Lake Initiative.
- Also in 1997, the state created the North Carolina Clean Water Management Trust Fund (CWMTF) the first state-funded program in the nation dedicated to funding activities to protect and improve waterways statewide. The CWMTF’s first grant was \$6 million to protect a large tract on the western shore of Mountain Island Lake.
- In 1999, Charlotte-Mecklenburg County passed a \$220 million “land-banking” bond to preserve land for open space, parks, greenways and schools.⁵ \$15 million was directed to preserve land within the Mountain Island Lake watershed. Twenty-one of the region’s 127 “stream miles” (areas bordering streams) deemed critical to maintaining the lake’s purity, were identified and protected. Conservation easements were established to pay land owners to keep the land natural and not sell to developers.
- Since 1999, more than \$31 million has been spent in Charlotte-Mecklenburg Counties, preserving 4,000 acres (including landowner donations of floodplains). Over \$9 million has been spent in neighboring Gaston and Lincoln Counties.

- Coincident with these conservation activities, laws were passed to control land use and regulate point sources of pollution in areas where land was already developed.

Today if you read the blogs concerning the lake, many people comment on how unspoiled the lake remains. One person noted that houses built on the lakefront have 100 foot setbacks from the shore⁶, to minimize runoff from lawn chemicals and other pollutants.

Today more than 6,000 acres of watershed land—approximately 74 percent of the lake’s shoreline—has been protected, which comes close to the original goal of preserving 80 percent.

This valiant effort is not finished. The region’s political leaders and conservationists are constantly having to deal with clever and creative land developers who are constantly trying to develop the region’s shoreline areas. This requires creativity on the part of the land conservators, who have adopted such innovative and bold strategies as raising utility rates to fund purchase of lands targeted for recent aggressive development by realtors in the area.

A Contrary Example: Falls Lake. My research revealed that North Carolina’s overall record in clean water initiatives is somewhat spotty. In 2002, North Carolina ranked ninth in the nation for the number of major facilities in violation of their clean water permits. A Toxic Release Inventory showed that facilities reported discharging more than 7 billion pounds of toxic chemicals into the environment in 2000, with more than 260 million pounds going into North Carolina waterways. In Summer 2006, Christine Wunche, clean water attorney for Environment North Carolina, said: “North Carolina is developing land at the 5th fastest rate in the nation and our water quality is suffering because of it.”

A specific example that stands in contrast to Mountain Island Lake is Falls Lake, which provides drinking water to thousands of residents of the state capital of Raleigh and six other municipalities. Exploding growth has raised pollution levels dramatically and sparked cause for alarm.



Falls Lake is part of the Neuse River Basin in Wake County, one of the fastest growing regions in the nation. The 12,000 acre lake is surrounded by 25,000 acres of public land, however, overdevelopment in the surrounding watershed basin has polluted a lake that physically appears to be surrounded by undeveloped shorelines but is fed by rivers whose shorelines are overdeveloped



(see photo). More than 750,000 people visit Falls Lake each year, leading to overcrowding and pollution by nonresidents as well as residents. In 2007 and 2008 the

lake levels dropped 8 feet below normal due to drought conditions (see photo) creating a 10 billion gallon deficit by February 2008. All outdoor water use was banned. The lake has since returned to “conservation” levels, barely adequate to meet restricted water use.

While federal and state initiatives have helped clean up the downstream portions of the Neuse estuary, they have *not* preserved water quality in rivers and lakes in upstream portions of

the basin—including Falls Lake. Increasing contamination of drinking water and pollution is rendering the lake unusable as a drinking water source. In 2008, Falls Lake was listed on the state’s “impaired waters” list as a result of degraded water quality. Impaired waters must be declared under Section 303(d) of the Clean Water Act.

On May 28-29, 2008, there was a large fish kill on the lake. More than a thousand fish died from an “unknown cause.” It has been theorized that this resulted from a prolonged drought in the region, the flushing of accumulated fertilizers and pet wastes from lawns, and sediment from construction sites, sewage overflows and failing sewage plants contributed to the pollution, including that which killed the fish.

Investment in land conservation has been low, considering the importance of Falls Lake. In 2005 the city of Raleigh pledged \$10,000 and began working with several land trusts to buy land or conservation easements upstream of the lake. As of April 2008, the Conservation Trust for North Carolina has managed a series of contracts worth \$2 million to protect land in the Upper Neuse River Basin along waterways that flow into Falls Lake and eight other water-supply reservoirs.⁷

There have been several examples of what critics call “backroom deals”—for example, in 2005 a permit was granted to allow the town of Butner, NC to increase its discharge of nitrogen pollutants into Falls Lake—the deal was cancelled after litigation by a consortium of organizations.⁸

On July 29, 2008, Falls Lake was listed as one of seven proposed sites for a laboratory being designed by the Department of Homeland Security to study animal diseases as well as diseases that are potentially lethal to humans. As part of the proposal, it was indicated that the facility’s waste would be discharged after pretreatment to a tributary of Falls Lake—Raleigh’s drinking supply. The Raleigh City Council voted to oppose the Butner site “in order to protect its drinking water from impacts of the facility’s construction as well as its operation.”⁹

The fact that this site was even considered for this project reveals a somewhat cynical and possibly irresponsible attitude toward Falls Lake, especially considering that it is already sending warning signals that it is becoming polluted.

The contrast between Mountain Island Lake and Falls Lake—especially given the importance of the latter to the state capital—is both striking and alarming. One set of communities used creative methods to raise the funding needed to effect dramatic change, by buying and setting aside threatened shoreline areas; while the other allowed runaway growth until it was too late to prevent watershed sprawl. Today, Charlotte has clean drinking water at a reasonable cost, while Raleigh the state capital has water that is being overused, rapidly becoming polluted and expensive to treat, and on the verge of being declared an “impaired” reservoir. In these two cases, sustainability is the hero, and watershed sprawl is the villain.

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