

## DROUGHT-RESISTANT WATER

Variable prices can work better than mandatory restrictions

- KEY FACTS:**
- **Water is a scarce resource and a commodity.**
  - **Some water systems do not change water rates based on demand.**
  - **No water system changes water rates based on supply.**
  - **Water prices, like prices for other commodities, should reflect changes in supply as well as demand.**
  - **Price adjustments allow water suppliers to earn enough to maintain and upgrade infrastructure and meet future needs resulting from growth.**
  - **Prices are more effective and efficient than alternative methods to ration water.**
  - **Water limits without prices can be regressive.**
  - **Water suppliers can provide subsidies to low-income households to prevent price increases from being regressive.**

North Carolina is in the midst of its worst drought in more than a century. Local water systems have put voluntary or mandatory restrictions on visible uses of water for landscaping and car washes. State agencies and Gov. Mike Easley have been seeking new ways to get more businesses, farms, and residential users to conserve water.

Some city councils, such as Raleigh's and Durham's, have discussed charging higher rates to those who use more water. Non-price mechanisms in the past have not produced long-run changes in behavior.<sup>1</sup> Prices are also a familiar and effective way to prompt behavior changes such as conservation.

### Priceless Problems

For example, as oil prices and refinery capacity plummeted after Hurricanes Katrina and Rita, gasoline prices also climbed. Consumers responded by reducing the number of miles they drive. While prices have remained high, consumers have purchased more fuel-efficient vehicles. Most water prices in North

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Carolina, however, are set annually by municipal governments during their budget process and so do not adjust to supply. Private water systems must get approval for rate increases from the North Carolina Utilities Commission, which can take months, again leaving little ability to change rates in response to supply.<sup>2</sup> Because water prices cannot respond to supply shocks such as a drought in the same way gasoline prices do, government leaders try other ways to discourage water use.

These voluntary and mandatory restrictions on water use limit the ways people can save water. Instead of saving by taking shorter showers, people simply do not pay attention because they do not have lawns to water, do not wash their cars, or have automatic sprinklers. No neighbors will stop by to check the length of their showers, that their dishwashers are full, or if they turn off the water while shaving or brushing their teeth. Even mandates on water-saving devices from low-flow toilets and showerheads to high-efficiency

washers have limited effects. In some cases, alternate watering days actually lead to more water usage as consumers water longer and are more conscientious about watering when they are limited to using water only on certain days.<sup>3</sup>

### Pricing Demand

A number of water systems in the state, such as in Greensboro and Charlotte, already charge higher rates to customers who use more water. With “increasing block pricing,” the water system charges higher rates in steps. This has proven to be an effective way to encourage users to conserve water without sacrificing much revenue.<sup>4</sup> The Town of Cary uses tiered prices, direct billing of renters for water consumption, and non-price conservation policies to reduce water demand in the town. The combination of policies was more successful than expected: conservation was so great that revenues were less than anticipated, and the city needed to raise rates in 2005.<sup>5</sup> Other municipal water systems, from Asheville to Wilmington, charge a single rate for each gallon, regardless of volume.

### Pricing Supply

Even where water rates are tiered for demand, however, they do not rise based on supply constraints such as droughts. State law allows adjustments to electrical and natural gas rates to promote conservation<sup>6</sup> or offset higher costs of fuel<sup>7</sup> and gas.<sup>8</sup> The General Assembly should make similar allowances for private and municipal water utilities facing supply constraints. For example, rates could rise 10 percent with each new level of drought,<sup>9</sup> leading to an eventual 61 percent increase. Rates could also rise by increasing percentages, up to two times the starting rate.

Municipalities already have a mechanism for price increases with their water restriction levels. Stage 1 restrictions could translate to a 10 percent price increase. Stage 4 restrictions could translate to a rate doubling.

	<i>Other fees</i>	<i>Rate per 100 cubic ft.</i>	
Asheville	\$8.33	\$3.32	
Raleigh	\$13.36	\$2.33	
Wilmington	\$9.80	\$1.87	
Greensboro	\$12.60	\$2.94	Up to 300 cubic feet
		\$4.10	300 - 1,000 cubic feet
		\$5.30	1,000-2,000 cubic feet
		\$6.80	2,000+ cubic feet
Charlotte	\$1.80	\$1.33	Up to 1,100 cubic feet
		\$2.18	1,200 - 2,200 cubic feet
		\$4.31	>2,200 cubic feet
Cary*	\$3.07	\$2.45	Up to 668.4 cubic feet
		\$2.81	668.5 - 1,069.4 cubic feet
		\$3.99	1,069.6 - 3,074.7 cubic feet
		\$8.10	>3,074.7 cubic feet

*100 cubic feet = 748.05194 gallons*

*Rates given are for city residents, with 5/8" or 3/4" meter*

*\*Prices converted from Cary charges based on 1,000 gallons*

## No Reason to Be Regressive

Price fluctuations need not be regressive, just as non-price adjustments may not be progressive. The Town of Cary has a program called Oasis that helps residents with their water bills. Many other municipalities that have tiered water prices also subsidize poorer households. These households have less discretionary water consumption and so can do less to cut back. Residential water customers with more land have more ability to reduce their water usage on landscaping and other discretionary items (more price elastic demand). Those with smaller lots have less ability to reduce their consumption (more price inelastic demand).

When a water supplier uses higher prices to encourage conservation, it has more revenue available than if it relied on cruder bans on types of water use. The supplier can increase the amount it transfers to poorer residents even if water usage falls by half. It also has more money to invest in creating reservoirs, water treatment plants, or other innovative ideas<sup>10</sup> to increase future capacity. The company or municipality can use this money to maintain the existing water and wastewater infrastructure, or to enhance it to meet expected demand growth. While conservation in Cary was so great that revenues were less than expected, it would be more typical for revenues to increase with water demand reductions induced strictly by higher prices.

Moreover, when the utility does not use price, it loses revenue when customers use less water. It therefore has less money available to subsidize customers who cannot afford their bills or to invest in expanding capacity. The result is more command-and-control policies on how to conserve water that focus on visible uses.<sup>11</sup>

Recent rains have helped temporarily to ease the drought, but with a dry winter and long-term population growth expected, policymakers need to look at more effectively pricing water. Local government officials should consider increasing block pricing to help manage demand. State lawmakers should make provisions to allow water prices to rise when supplies fall, just as the Utilities Commission now allows other utility prices to rise when their input costs rise. Prices are a more efficient, effective, and welfare-enhancing way than forced-conservation schemes to match supply and demand for water.

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***These rate increases are a function of lower consumption (due to weather and conservation efforts), debt service, and payments for capital infrastructure.***  
— Town of Cary statement, 2005

## End Notes

1. Matthew Easley, David Bracken and Anne Blythe, “02 zeal to save water dried up,” *The News & Observer* (Raleigh, NC), November 4, 2007, [www.newsobserver.com/news/story/760212.html](http://www.newsobserver.com/news/story/760212.html).
2. North Carolina Utilities Commission dockets for water price increases show increases can take from three months to a year between application and approval.
3. Sheila M. Olmstead and Robert N. Stavins, “Managing Water Demand: Price vs. Non-Price Conservation Programs,” Pioneer Institute, July 2007, [www.pioneerinstitute.org/pdf/070718\\_wp\\_olmstead\\_stavins.pdf](http://www.pioneerinstitute.org/pdf/070718_wp_olmstead_stavins.pdf).
4. Ellen Pint, “Household Responses to Increased Water Rates During the California Drought,” *Land Economics* 75(2), May 1999: 246-266.
5. “Town of Cary, Revenue Sources and Trends – Utility Fund, Fiscal Year 2005,” [www.townofcary.org/depts/budget/fy2005/approved/aob/utilityfund/revsourcetrendsutilityfund.pdf](http://www.townofcary.org/depts/budget/fy2005/approved/aob/utilityfund/revsourcetrendsutilityfund.pdf).
6. G.S. 62-155.
7. G.S. 62-133.2.
8. G.S. 62-133.4.
9. The North Carolina Drought Management Council lists the stages from abnormally dry (D0) through Exceptional Drought (D4) and provides descriptions on its home page, [www.ncdrought.org](http://www.ncdrought.org).
10. Luis F. Perez, “Coming to a tap near you?: Plantation and Sunrise are two of the cities conducting pilot studies on ways to use treated wastewater to boost drinking water supplies,” Fort Lauderdale *Sun-Sentinel*, October 24, 2007. Reposted by Government Innovators Network, [www.innovations.harvard.edu/news/67261.html](http://www.innovations.harvard.edu/news/67261.html).
11. While municipalities and the governor encourage people to conserve, however, state law bans the reuse without treatment of gray water that has been used in sinks, showers, and other household applications, which can hamper conservation efforts in North Carolina. See for example, Anne Blythe, “Reuse of water often illegal,” *News & Observer*, November 2, 2007, [www.newsobserver.com/weather/drought/story/757968.html](http://www.newsobserver.com/weather/drought/story/757968.html).