

2019

North Carolina Water and Wastewater Rates Report



SCHOOL OF
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Environmental
Finance Center



Water Infrastructure
ENVIRONMENTAL QUALITY



ABOUT THIS REPORT

This report is just one resource in a series on North Carolina water and wastewater rates, funded by the North Carolina Department of Environmental Quality's Division of Water Infrastructure (DWI) and compiled by the North Carolina League of Municipalities (the League) and the Environmental Finance Center at the University of North Carolina at Chapel Hill (EFC).

In addition to this report, there is an accompanying set of **tables** and standardized water and wastewater **rate sheets** for each participating utility. Furthermore, with the online, interactive **Rates Dashboard**, users can compare utilities against various attributes such as geographic location, system characteristics, and customer demographics, as well as utilize financial indicators and benchmarks.

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INTRODUCTION

Between October 2018 and January 2019 the EFC and the League conducted a survey of 523 rate-charging water and wastewater utilities in North Carolina.

A total of **496** utilities participated by providing their rate schedules, yielding a response rate of **95%** of utilities, and accounting for **94%** of all North Carolina citizens served by community water systems. Utilities from all 100 counties in the state are represented in this survey group.

Water and wastewater rate setting is one of local government's most important environmental and public health responsibilities. This report aims to provide utility professionals and public officials with an up-to-date, detailed survey of current statewide rate structures and trends, and thus assist in the protection of public health, improvement of economic development, and promotion of sustainability in North Carolina.

Water and wastewater **rates** ultimately determine how much **revenue** a community has to maintain **vital infrastructure**.

UTILITIES IN THE SURVEY

 **102** utilities serving
WATER ONLY

 **30** utilities serving
WASTEWATER ONLY

 **364** utilities serving
WATER AND WASTEWATER



74%
MUNICIPALITY

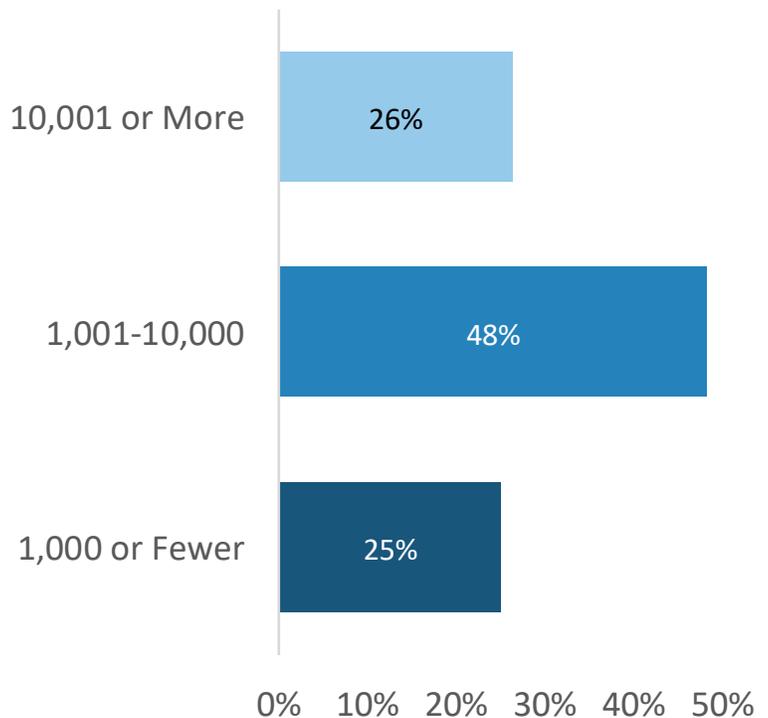
12%
COUNTY/DISTRICT

7%
NOT-FOR-PROFIT

7%
OTHER

Distribution of Responding Utilities by
Service Population

n=496



WHAT DO RATE STRUCTURES LOOK LIKE?

BASE CHARGES

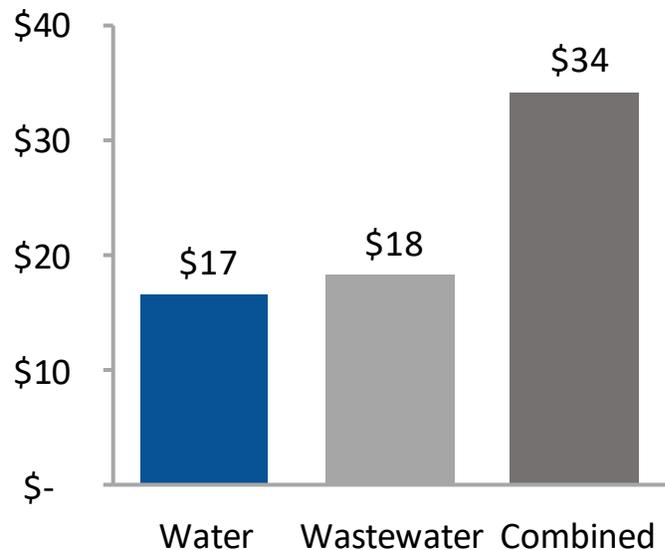
Considerable variation exists in how utilities model rate structures, but almost all use a combination of **base charges** and **volumetric charges** to determine billing for their services.

Base charges do not vary from month to month regardless of consumption. These charges can be a constant, universal amount for all customers, or vary based on customer class (e.g. residential vs. commercial) or meter size. Base charges sometimes feature a *consumption allowance*, an included amount of usage that the customer is not separately charged for.

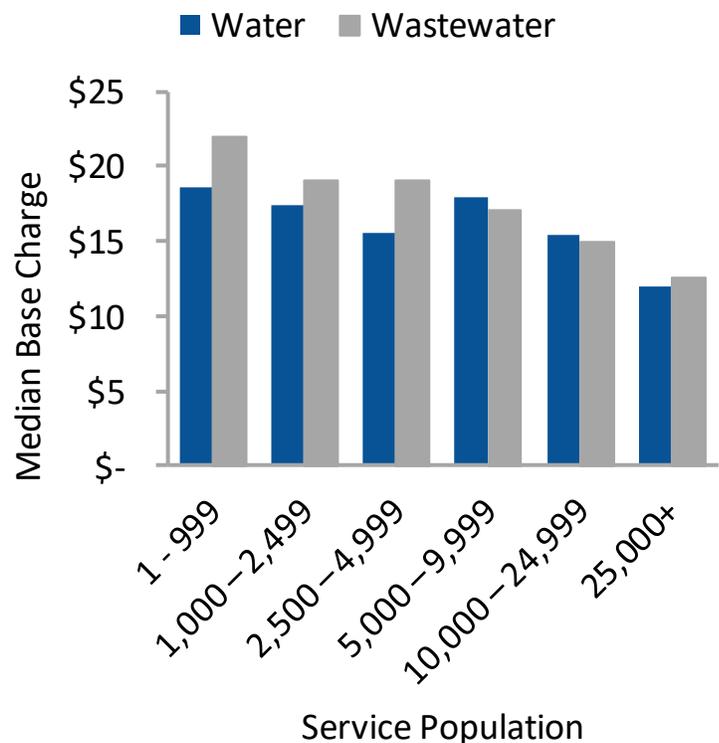
In this year's rate survey, 100% of surveyed water rate structures and 99% of surveyed wastewater rate structures included a base charge.

In North Carolina, 57% of water rate structures with base charges included a consumption allowance. The median monthly consumption allowance is 2,000 gallons.

Median Monthly Base Charge Amounts



Larger water utilities tend to have **lower** base charges than smaller utilities, likely because they are able to spread **fixed costs** across a greater customer base.



WHAT DO RATE STRUCTURES LOOK LIKE?

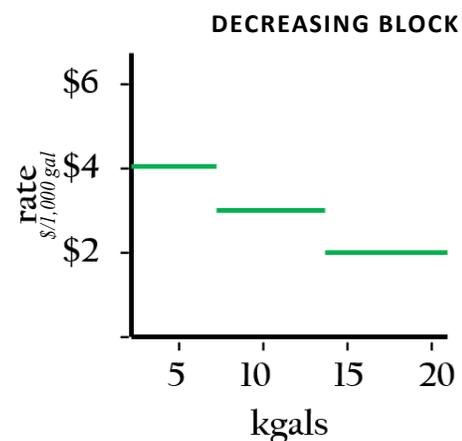
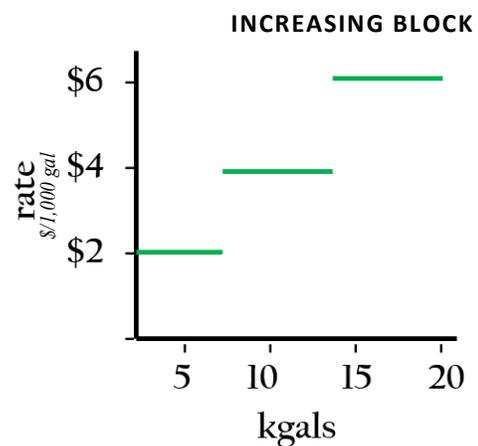
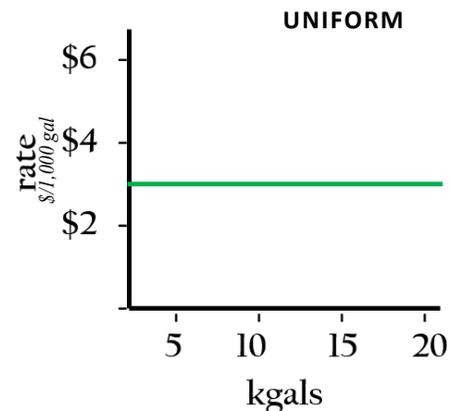
VOLUMETRIC CHARGES

Volumetric (variable) charges are based on the volume used after exceeding the consumption allowance included with the base charge (if any). Three common rate structures are uniform, increasing block, and decreasing block.

With a **uniform rate** structure, the rate does not change as the customer consumes more.

In an **increasing block rate** structure, the rate increases as the customer uses more. This structure is often employed by utilities that want to encourage conservation by making higher volumes of consumption more expensive.

The rate per unit decreases with greater consumption in a **decreasing block** structure. This type of rate structure is more often employed in commercial and industrial rate structures only affecting high volumes of water use.



WHAT IS THE MOST COMMON VOLUMETRIC RATE STRUCTURE?

In North Carolina the majority (62%) of residential water and wastewater rate structures use a **uniform rate** to charge for volume. Standardized to thousands of gallons, the median uniform rate is **\$4.81 for water** and **\$5.96 for wastewater** services.

WHAT ARE UTILITIES CHARGING?

North Carolina's Median Bills

Residential (5,000 GALS)

\$34.60
MONTH

\$415.20
YEAR

WATER



Commercial (50,000 GALS)

\$261.85
MONTH

\$3,412.20
YEAR

\$42.75
MONTH

\$513.00
YEAR

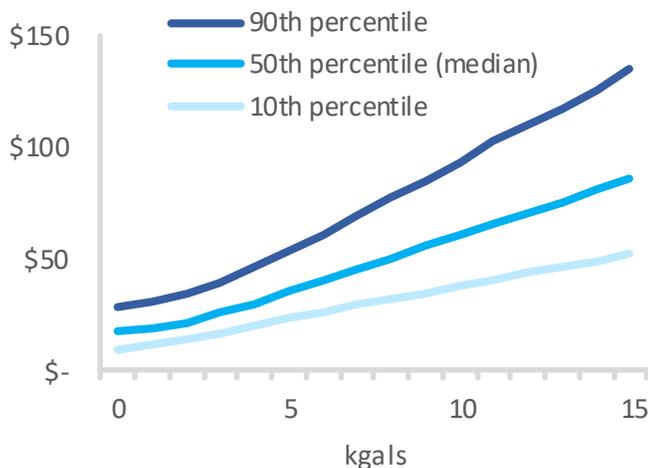


\$328.00
MONTH

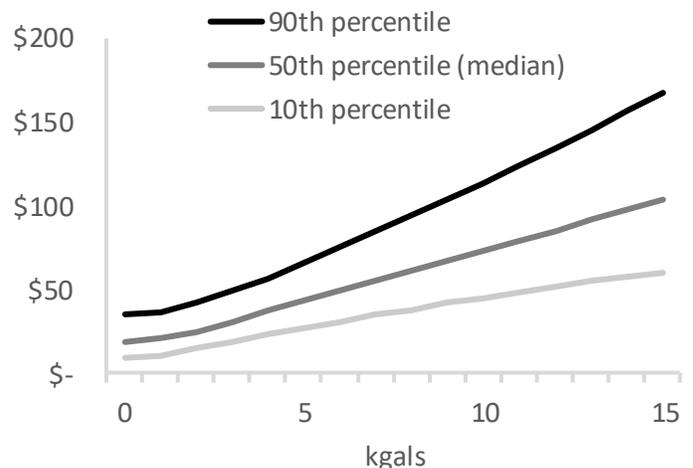
\$3,936.00
YEAR

WASTEWATER

Spread of Middle 80% of Water Bills



Spread of Middle 80% of Wastewater Bills



RANGE OF BILLS

As volume increases, the median wastewater bill tends to rise at a **greater rate** than the median water bill. Wastewater bills are **9-25% higher** than water bills.

While reporting the median bill is helpful for understanding the “big picture” for water and wastewater bills, it does not show the total distribution of bills, including the lowest and highest costs at different consumption levels. The graphs above show the range of the middle 80% of bills (from the 10th percentile to the 90th percentile) for 0 to 15 kgals.

HOW DO OUTSIDE RATES COMPARE?

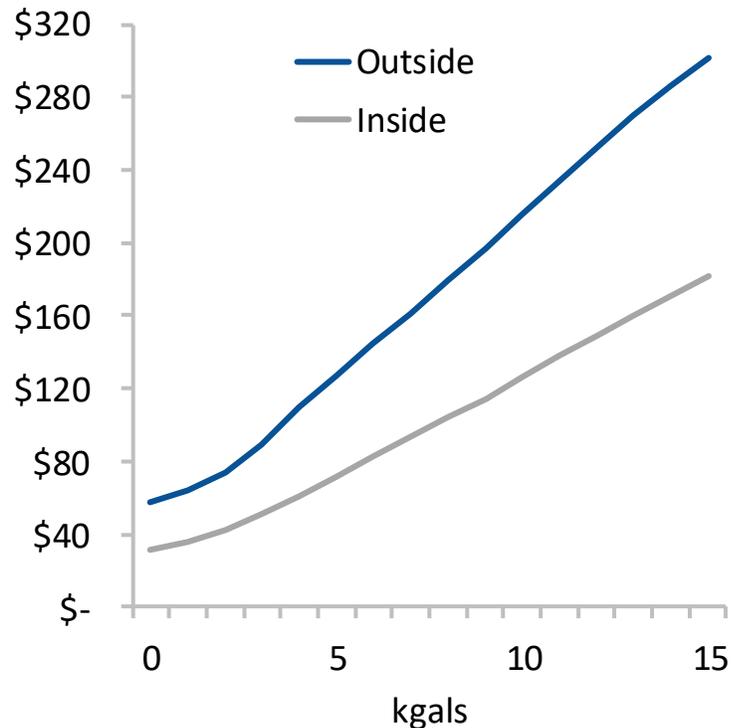
INSIDE VS. OUTSIDE RATES

All of the charges presented above refer to what utilities charge customers that live within their political boundaries. Municipal utilities often serve customers who live outside of city limits, and a handful of other utilities specify geographical boundaries within their service areas and identify their customers as residing “inside” and “outside” those boundaries. In many cases, utilities charge different rates for customers living inside or outside the boundary.

In North Carolina **62%** of water rate structures and **63%** of wastewater rate structures **charge outside rates.**

As volume increases, the median combined water and wastewater bill for outside rates tends to rise at a **greater rate** than the median combined water and wastewater bill for inside rates. Outside bill amounts are **66-81% higher** than inside bill amounts.

Median Combined Water and Wastewater Bill



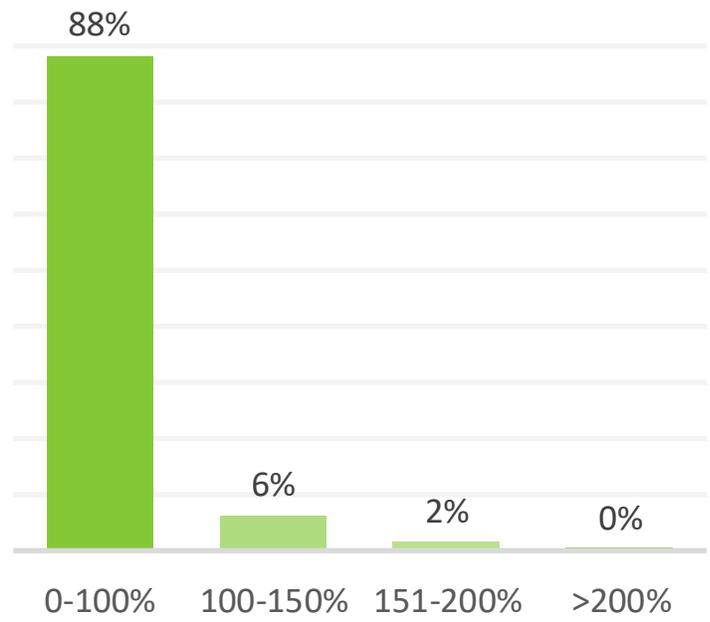
For inside rates, the median combined water and wastewater bill at 5,000 gallons is **\$71.50** and for outside rates, the median combined water and wastewater bill at 5,000 gallons is **\$126.75**.

Generally, outside rates are greater than inside rates because customers reside farther, on average, from the water and wastewater treatment plant than inside customers. Extra costs for distribution and collection systems justify higher rates for outside customers.

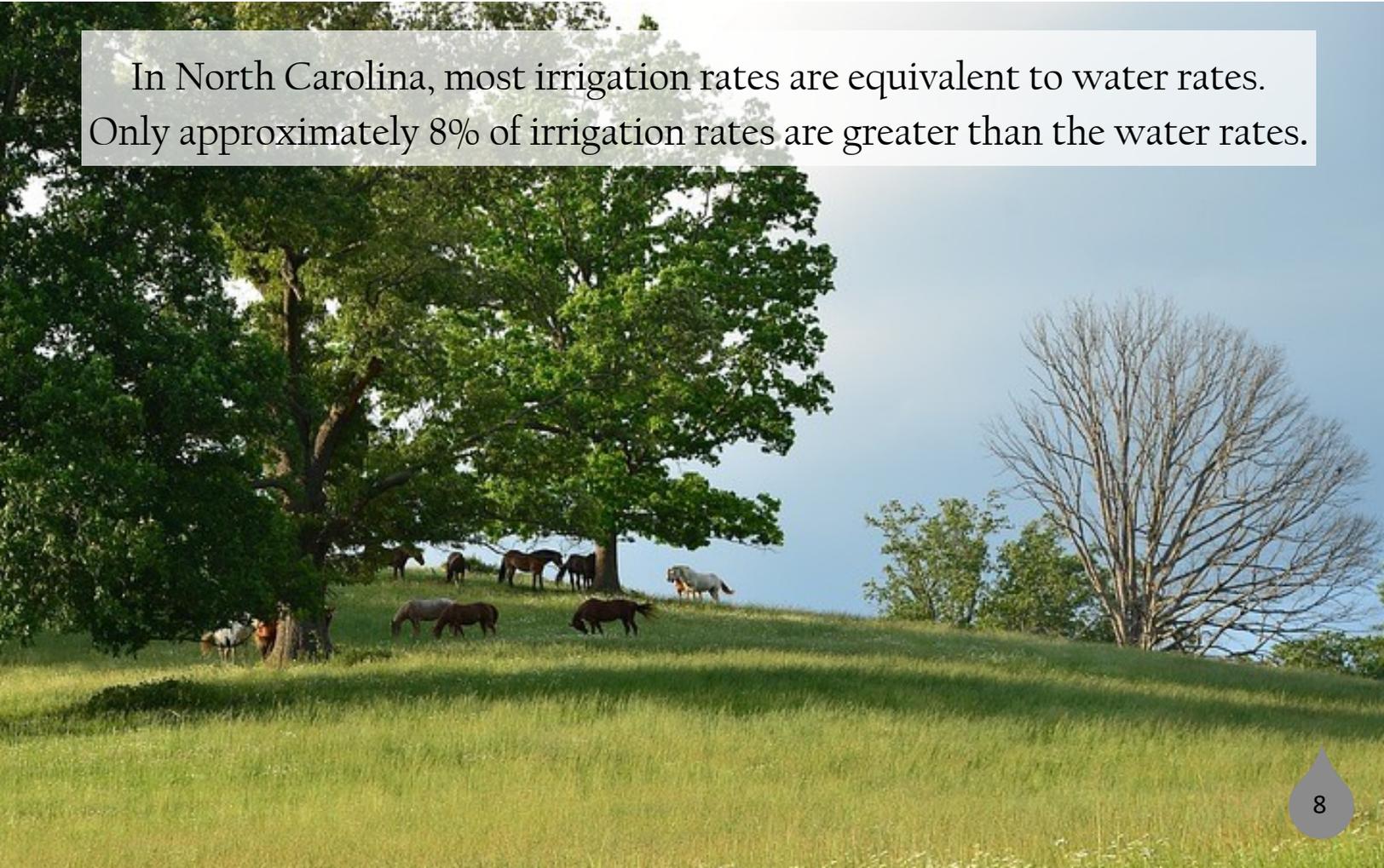
HOW DO IRRIGATION RATES COMPARE?

Sometimes utilities will create unique residential irrigation rates. When the same utility provides water and wastewater service, the wastewater service is often tied to metered water consumption. To separate outdoor water use from wastewater use, utilities will sometimes meter separately for irrigation. These unique irrigation rates do not charge customers for the equal wastewater use and, as a result, are often slightly more expensive than water rates, but less than the equivalent combined water and wastewater rate, if the irrigation rate did not exist.

Ratio of Irrigation Rates to Inside Water Rates for 499 Rate Structures

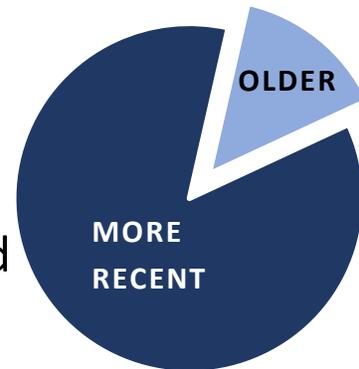


In North Carolina, most irrigation rates are equivalent to water rates. Only approximately 8% of irrigation rates are greater than the water rates.



WHEN WERE RATES LAST CHANGED?

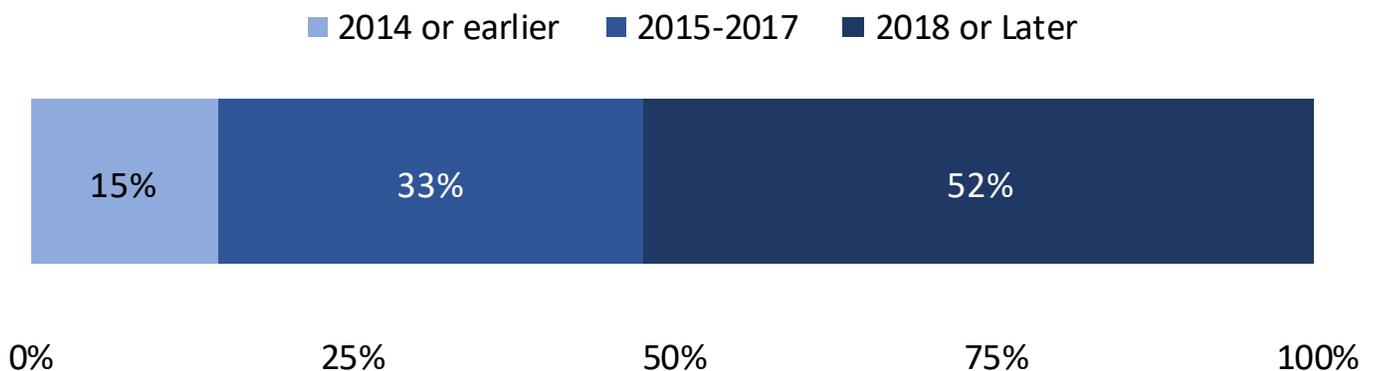
- The **85%** of utilities have updated rates since **AT LEAST 2015**.
- About **1 IN 7** utilities have not updated their rates since **2014** or earlier.



Most North Carolina utilities are actively evaluating and modifying their rate structures every one to two years. An annual or biennial review gives utilities the opportunity to evaluate if their current rates are enough to cover increasing operating expenses, debt service, and what will be needed for future capital costs and reserves.

Utilities that modestly raise rates at more frequent intervals accumulate more revenue over time than those that implement less frequent, but more drastic rate increases. Customers are also less likely to balk at more gradual, periodic rate increases than a one-time price hike.

The calendar year when sampled rate structures were first put into effect is shown below for 517 rate structures*.



*The year that rates became effective is known for 517 out of the 542 rate structures in the survey.

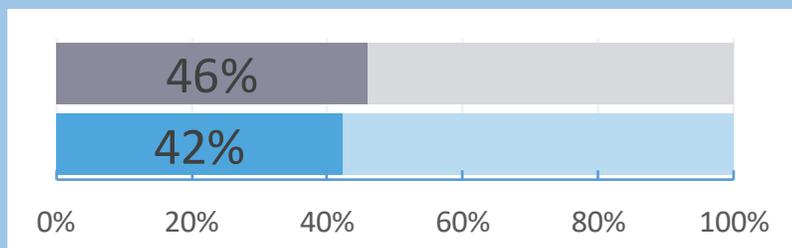
WHEN WERE RATES LAST CHANGED?

As costs of providing service rise, so should rates. Providing water and wastewater service is costly and infrastructure intensive. Regular, predictable rate increases are common and recommended. The North Carolina Water and Wastewater Dashboard has been an EFC product since 2007. As a result, years of rates data have been collected and are available to analyze trends and changes.

The graphs below reflect changes in residential rates over the last year and from 2010-2019, respectively. Each graph reflects data from a cohort. The first graph represents only rate structures present in both 2017 and 2018, and the second graph represents only those water rate structures with rates data for the entire period of 2010-2019.

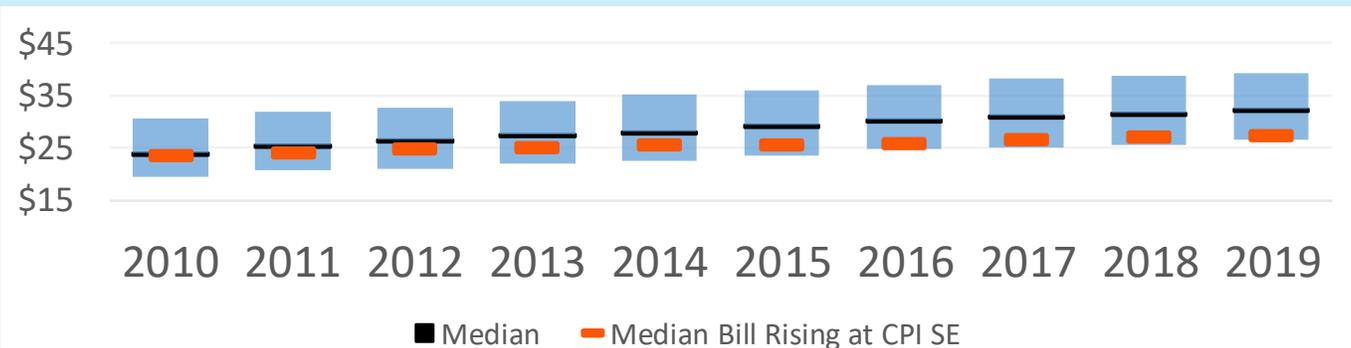
Percent of Rate Structures that Increased Residential Rates from 2018-2019

Water N=478 Rate Structures, Wastewater N=396 Rate Structures



To assess how trends in bills have changed compared to inflation, 2010 billing data was normalized to the Consumer Price Index for the Southeast region, from the Bureau of Labor Statistics. The **orange line** represents the median bill rising only at CPI, while the black line represents the median bill from surveyed utilities over time.

Trends in Monthly Water Bills, at 5,000 Gallons per Month, Relative to CPI-Southeast for 244 Water Rate Structures, 2010-2019



The rise in median monthly water bills **outpaces inflation.**

DO PRICES REFLECT THE TRUE COST OF SERVICE?

Utilities sometimes fall into the trap of pricing services based on what their customers have always paid, rather than focusing on the bottom line of the balance sheet. This year, **310 utilities** out of the total 496 utilities (63%) provided their most recent annual financial reports to the survey. While statewide conclusions cannot be drawn from this limited dataset, there are some notable trends. First, some essential definitions:

WHAT IS OPERATING RATIO?

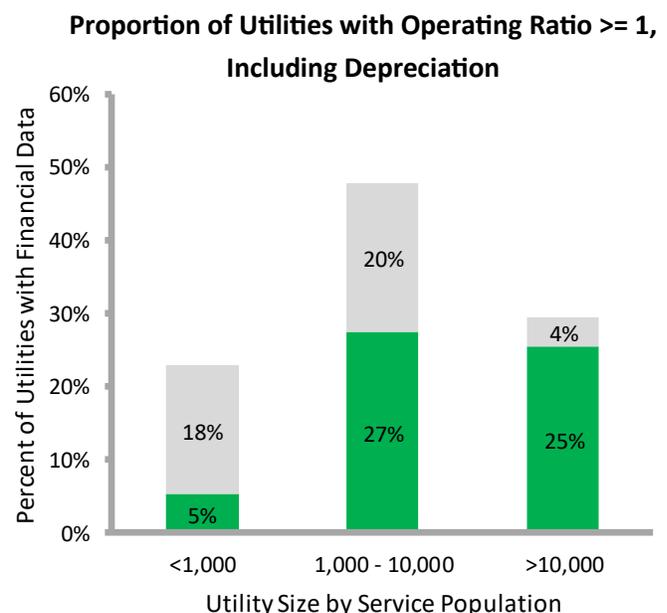
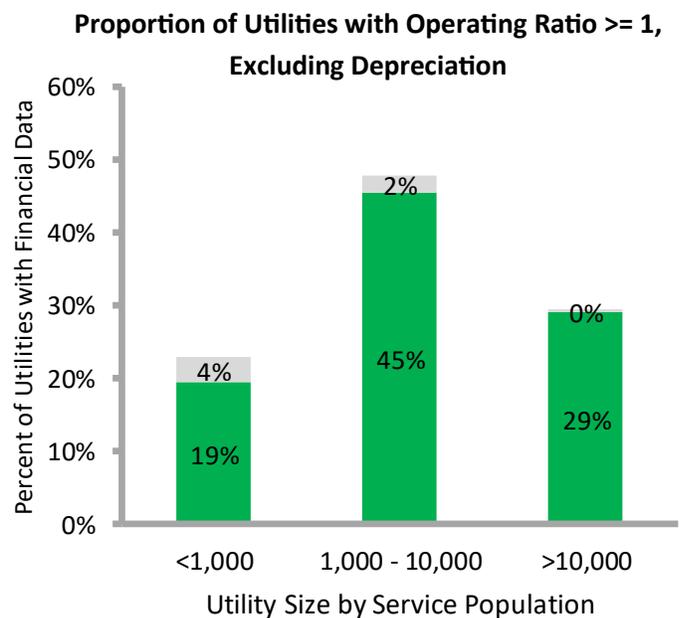
Operating ratio, also known as cost recovery ratio, is a financial benchmark that determines if an entity is operating at a loss, gain, or just breaking even. The ratio is simply the division of operating revenues by operating expenses, which can include or exclude depreciation. **A utility's operating ratio must be *at least 1.0* to break even.**

WHY INCLUDE DEPRECIATION?

Whenever possible, depreciation should be included in operating expenses to account for the inevitable cost of replacing equipment and infrastructure at the end of its expected useful life.

Depreciation allows costs to be figuratively parceled out over time, avoiding a sudden, enormous expense when the time comes to replace assets. Consider the differences in the graphs below with and without depreciation factored into operating expenses.

- Operating expenses < Operating revenues
- Operating expenses > Operating revenues



DO PRICES REFLECT THE TRUE COST OF SERVICE?

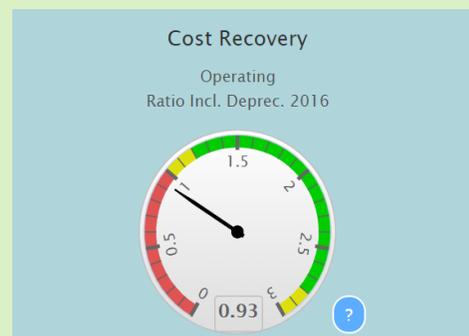
Without accounting for depreciation, **291 out of 310** utilities with financial data (94%) generated enough revenue to recover operating costs. Of the utilities that were not able to recover expenses, 18 out of 19 serve fewer than 10,000 people.

With depreciation included, **180 of the 310** (58%) utilities generated enough revenue to cover operating expenses. 118 out of 130 of the utilities with an operating ratio of less than 1.0 serve fewer than 10,000 people.

All utilities face the issue of generating sufficient revenue to pay for the high fixed costs of providing safe and reliable services. However, smaller utilities must spread out those high fixed costs over a smaller customer base.

WHAT IS CONSIDERED HEALTHY?

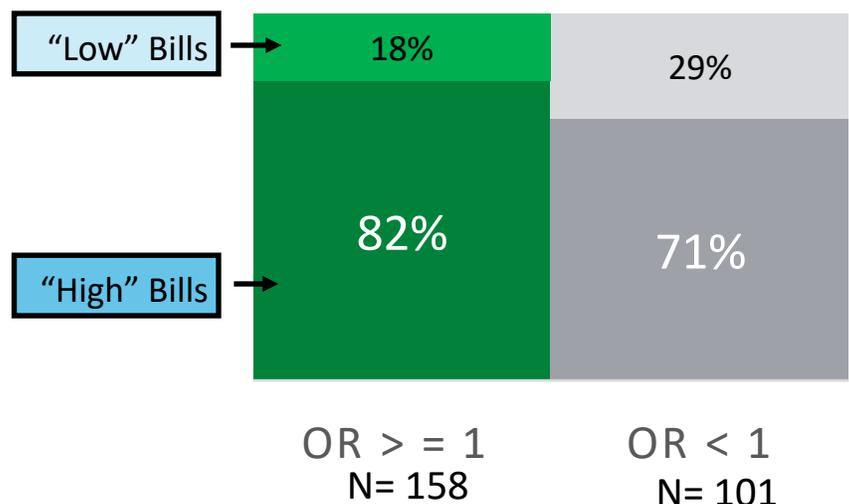
The Cost Recovery dial on the **Rates Dashboard** uses red, yellow, and green bands to give the viewer a simplified idea of the health of the utility's operating ratio at a glance.



While it is clear that being “in the red” is not a good position to be in, there is no universal standard for what constitutes a healthy operating ratio beyond 1.0.

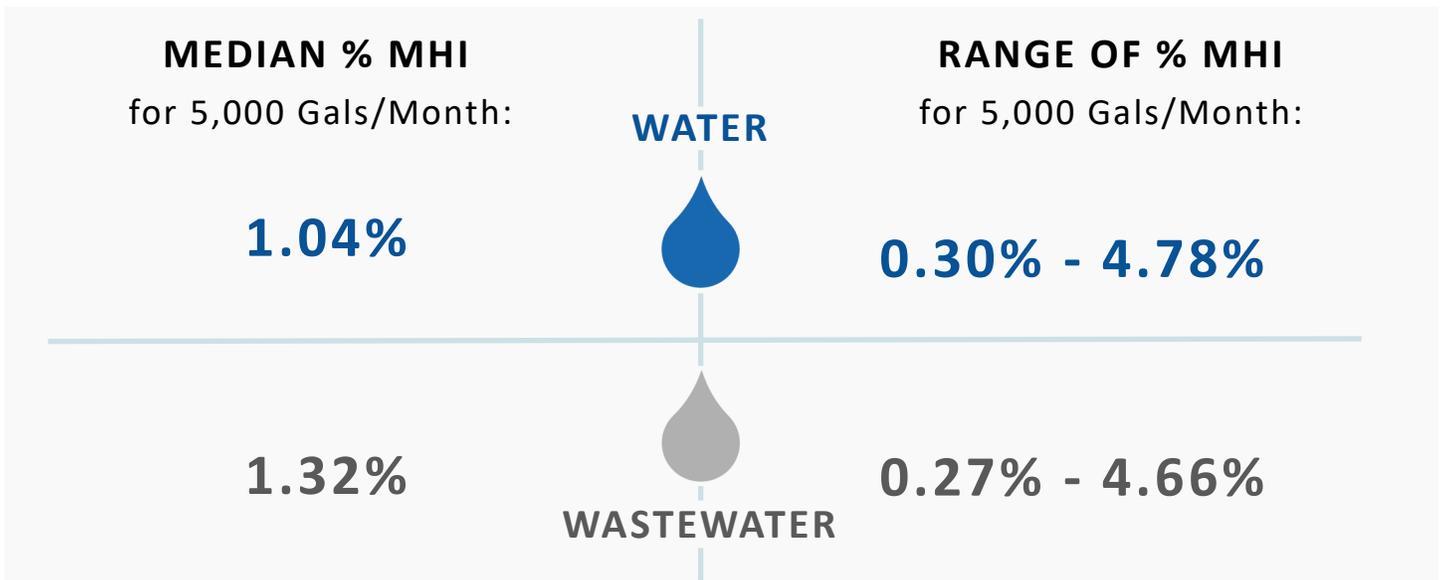
In addition to utility size, other factors can be correlated to financial sustainability. Improved cost recovery and higher monthly bills are sometimes linked. The figure below shows the distribution of utilities' bills based on their operating ratios. Of those utilities with operating ratios of 1.0 or greater, **82% have combined bills (5,000 gallons/month) of \$60 or more.**

Proportion of 259 Utilities with High (\$60 or More) or Low (<\$60) Combined Bills, Based on Operating Ratio

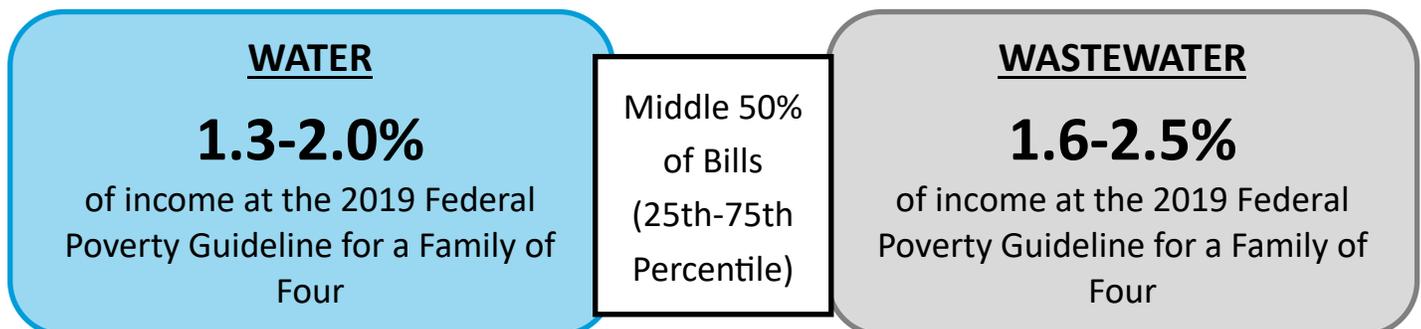


HOW AFFORDABLE ARE RESIDENTIAL BILLS?

Assessing rate affordability remains a challenge, because there is no one true, universal measure of affordability. The most commonly used indicator, **Percent Median Household Income (% MHI)**, calculates how a year's worth of water and wastewater bills, in this case 5,000 gallons/month, compares to the MHI of the community served by the utility. MHI is provided by the most recent 5-year estimates of the US Census Bureau's American Community Survey.



As all communities have a range of income brackets, it is important to keep in mind that what may seem like a small percentage of the community's MHI can have a proportionally larger impact on lower-income populations. A growing concern for utilities is how rising rates will affect the lowest income customers. This includes households making less than or equal to the **federal poverty guideline for a family of four (\$25,750 in 2019)**, according to the US Department of Health and Human Services.



For a more in-depth look at the affordability of water and wastewater services in a community, the EFC offers the free, Excel-based **Residential Rates Affordability Assessment Tool**, available for download on their website.

FURTHER RESOURCES

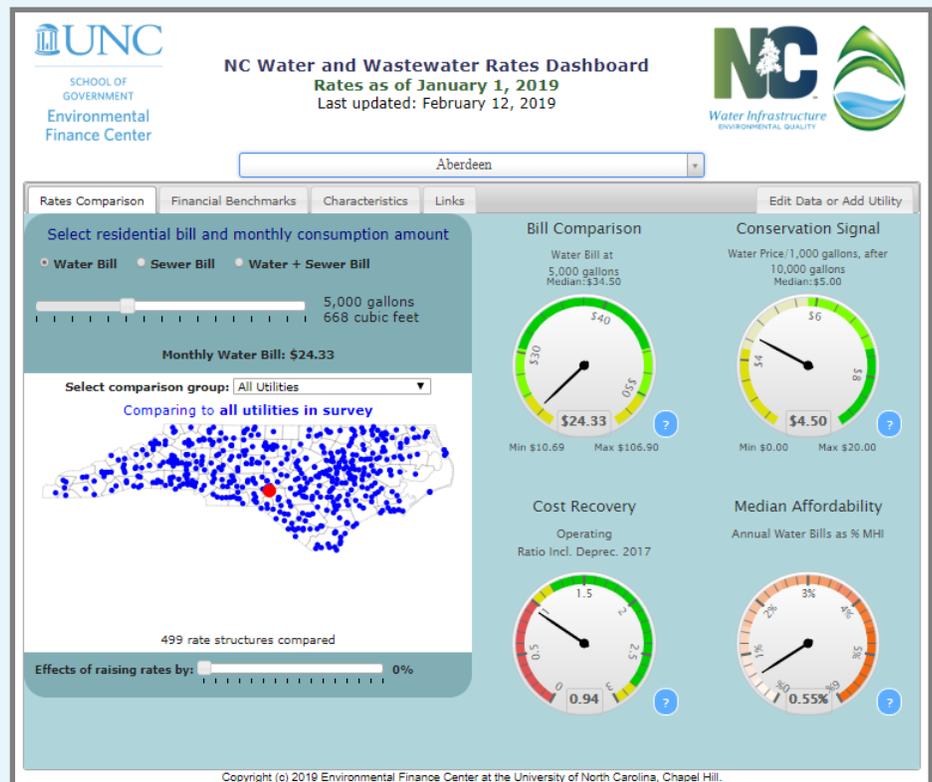
All of the following free resources are available at: <https://unc.live/2RXLdEU>

⇒ **2019 Water and Wastewater Rates Dashboard**

⇒ Recorded **webinar**

⇒ Downloadable **tables of rates and rate structures** for residential, commercial, and irrigation customer classes for water and wastewater in North Carolina

⇒ Standardized copies of **rate sheets** for all utilities in the survey



QUESTIONS? FEEDBACK?



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The water and wastewater rates surveys have been conducted in NC since 2005 and represent a long-standing tool for North Carolinians, as well a wealth of useful rates data. The EFC would like to thank all partners involved over the course of the rates survey for their contributions in allowing this project to continue over these years.



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