

2020

North Carolina Water & Wastewater Rates Report



SCHOOL OF
GOVERNMENT

Environmental
Finance Center



NCLM

NC LEAGUE OF MUNICIPALITIES



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 (NCLM) and the Environmental Finance Center (EFC) at the University of North Carolina at Chapel Hill.

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 financial indicators and benchmarks.



CONTRIBUTORS TO THE REPORT

NC Department of Environmental Quality's Division of Water Infrastructure:

Kim Colson, Division Director, Francine Durso, Special Issues Technical Lead

North Carolina League of Municipalities:

Chris Nida, Direction of Research and Strategic Initiatives

The Environmental Finance Center at UNC Chapel Hill:

Annalee Harkins, *Data Specialist & Project Manager*, **Austin Thompson**, *Project Director*, **Shadi Eskaf**, *Research Director*, **Erin Ansboro**, *Data Researcher*, **Kelly Cuthbertson**, *Data Researcher*, **Samantha Haughton**, *Technical Research Assistant*, **Cassidy Harding**, *Technical Research Assistant*, **Christian Lutz**, *Student Data Analyst*, **Melanie Sanchez**, *Student Data Analyst*, **Rachel Austin**, *Student Data Analyst*, **Rebecca Hall**, *Student Data Analyst*, **Keondra Jenkins**, *Student Data Analyst*

INTRODUCTION

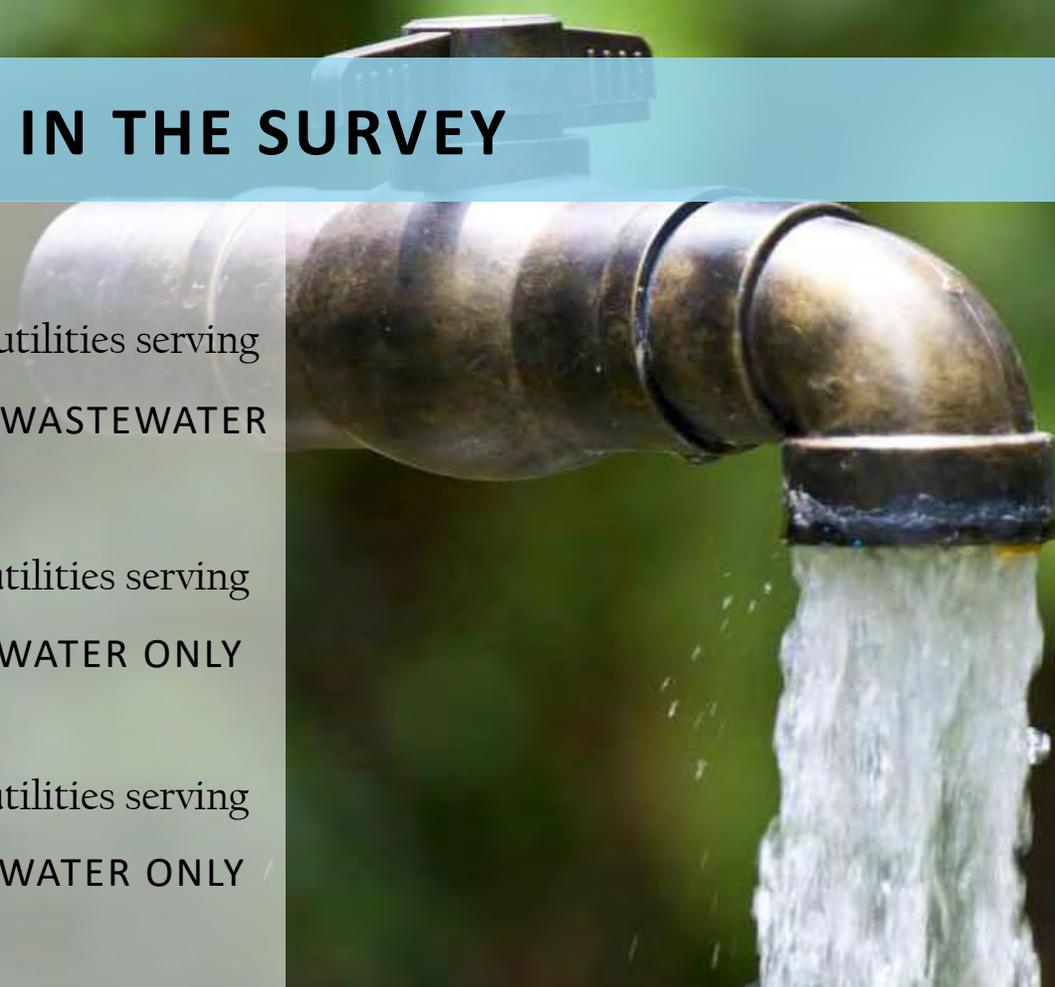
Between October 2019 and January 2020 the EFC and NCLM conducted a survey of 517 rate-charging water and wastewater utilities in North Carolina.

A total of 495 utilities (96%) from all 100 counties in the state are represented in this survey group.

Water and wastewater rate setting is one of a 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



 369 utilities serving
WATER AND WASTEWATER

 96 utilities serving
WATER ONLY

 30 utilities serving
WASTEWATER ONLY

74%
MUNICIPALITY

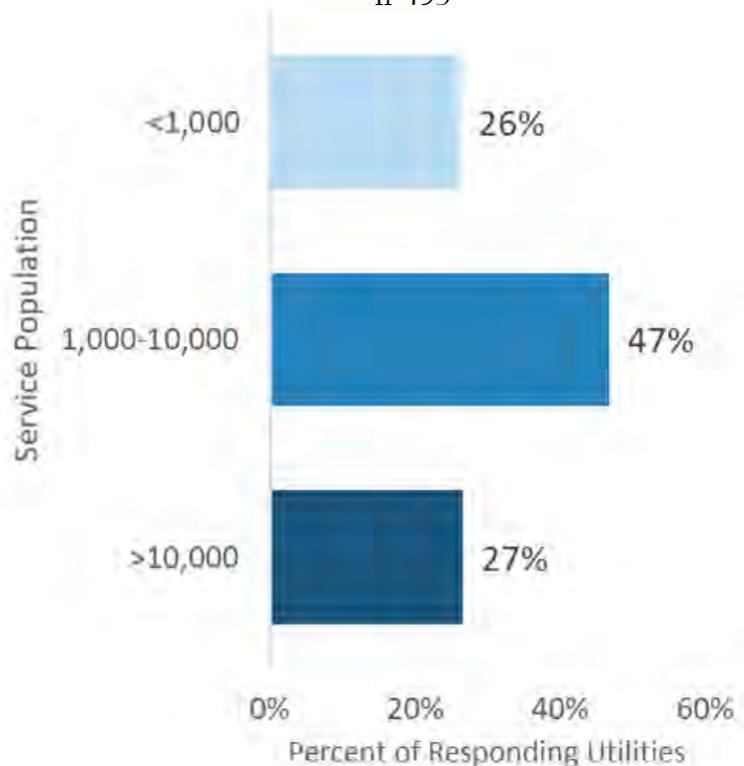
12%
COUNTY/DISTRICT

6%
NOT-FOR-PROFIT

7%
OTHER

Distribution of Utilities
by Service Population

n=495



WHAT DO RATE STRUCTURES LOOK LIKE?

BASE CHARGES

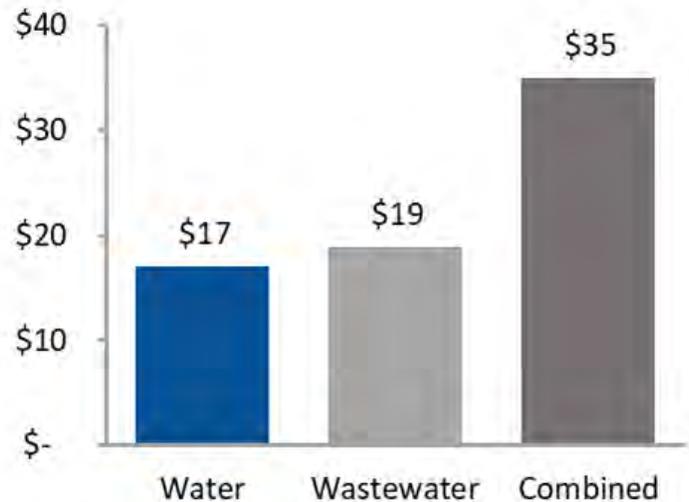
Considerable variation exists in how utilities model rate structures, but almost all use a combination of **base charges** and **volumetric charges** to determine billing for their services.

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, 99% of surveyed water rate structures and 98% of surveyed wastewater rate structures included a base charge.

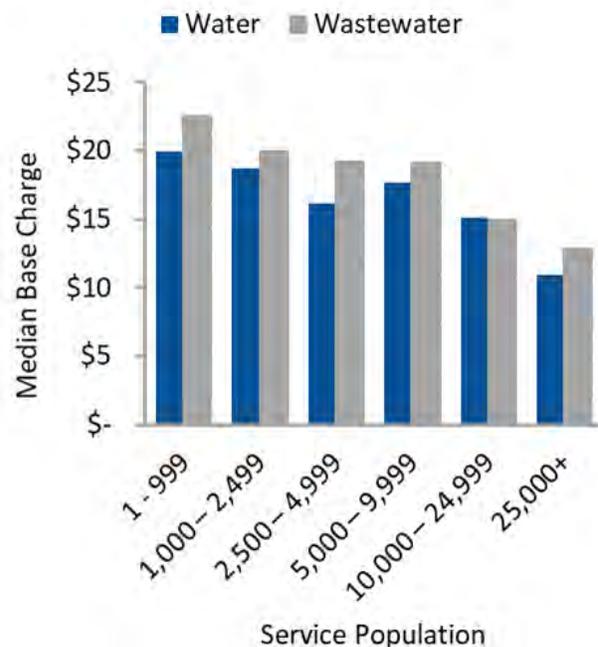
In North Carolina, **55% of water rate structures** with base charges included a consumption allowance. The median monthly consumption allowance is **2,000 gallons**.

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.

Median Monthly Base Charge Amounts
by Service Population



WHAT DO RATE STRUCTURES LOOK LIKE?

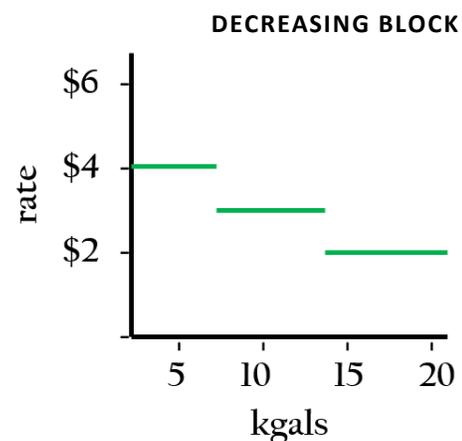
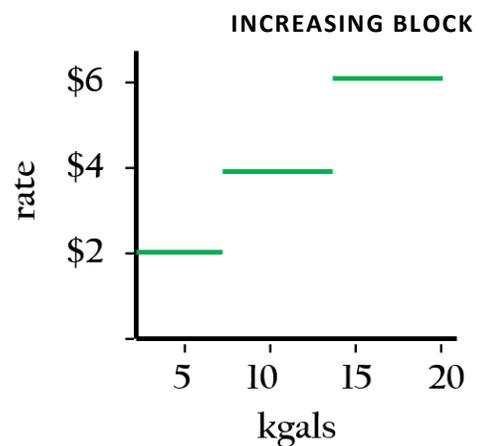
VOLUMETRIC CHARGES

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 may be used to encourage economic development by high-volume users such as commercial businesses.



WHAT IS THE MOST COMMON VOLUMETRIC RATE STRUCTURE?

In North Carolina the majority (64%) 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 **\$5.00 for water** and **\$6.11 for wastewater** services.

WHAT ARE UTILITIES CHARGING?

North Carolina's Median Bills

Residential (5,000 GALS)

Commercial (50,000 GALS)

WATER

\$35.98
MONTH

\$431.70
YEAR



\$267.25
MONTH

\$3,207.00
YEAR

\$44.27
MONTH

\$531.24
YEAR

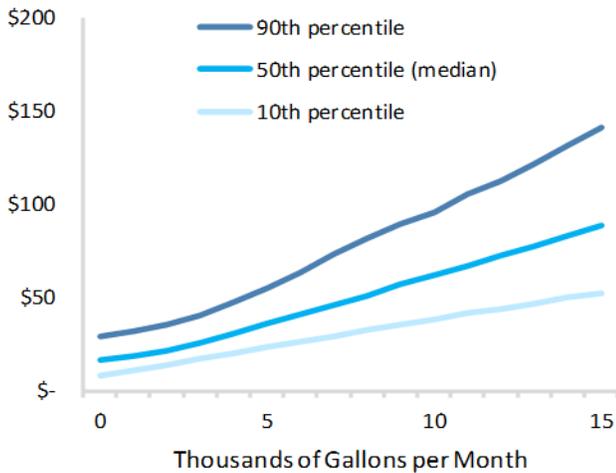


\$339.67
MONTH

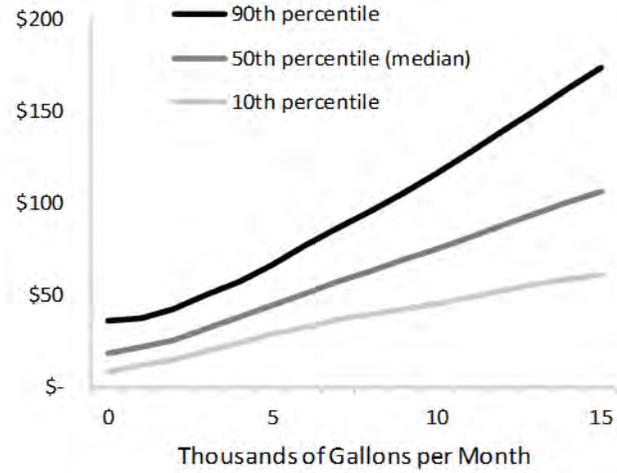
\$4,076.04
YEAR

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 from *9% to 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?

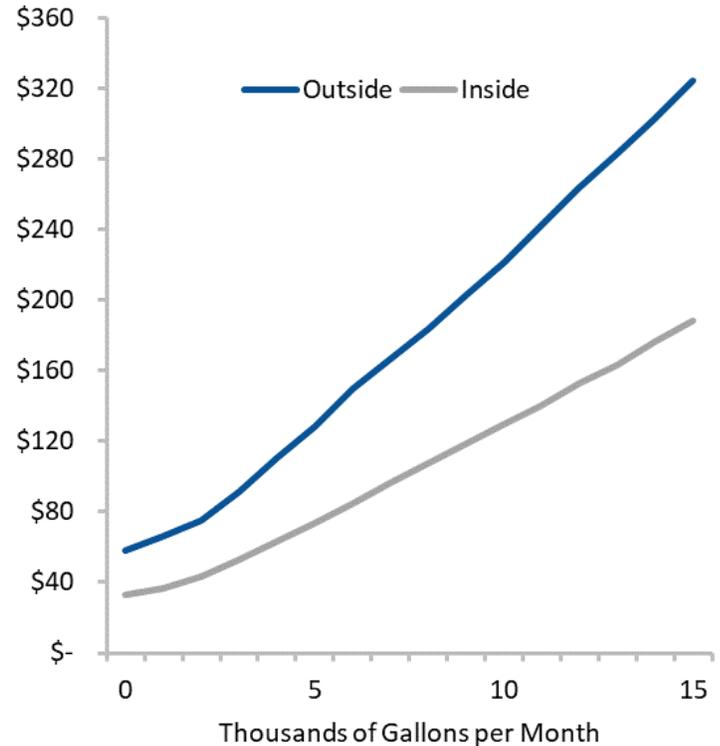
INSIDE VS OUTSIDE RATES

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 **60%** of water rate structures and **62%** 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 from *71% to 78% higher* than inside bill amounts.

Median Combined Water and Wastewater Bill



The median combined water and wastewater bill at 5,000 gallons is **\$73.56** for customers inside service boundaries and **\$128.77** for those outside of service boundaries.

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?

Some utilities offer unique 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, which does not go into the wastewater system, 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 combined water/wastewater rate if no irrigation rate existed.

Ratio of Irrigation Rates to Inside Water Rates for 510 Rate Structures

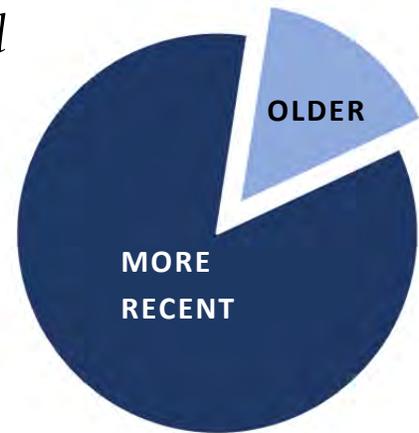
■ 0-100%
 ■ 101-150%
 ■ 151-200%
 ■ > 200%



In North Carolina, most irrigation rates are equivalent to water rates. Only approximately 10% of irrigation rates are greater than water rates, and only approximately **2% are greater than 1.5x the water rate.**

WHEN WERE RATES LAST CHANGED?

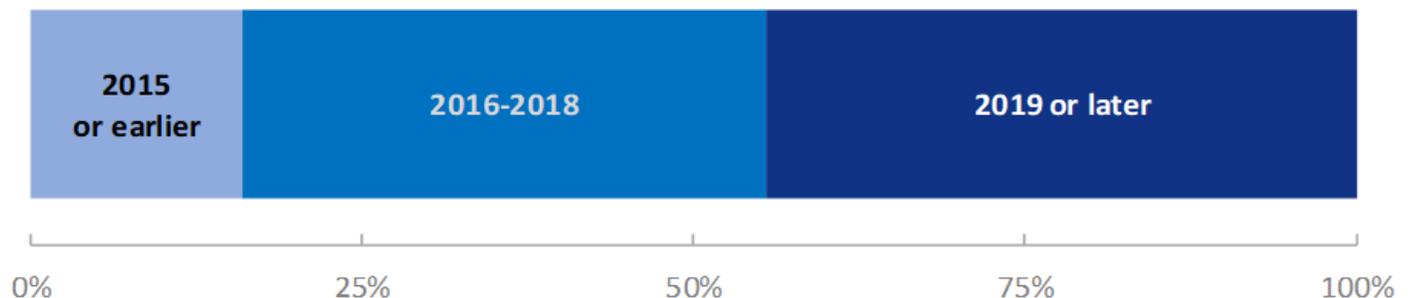
- The **MAJORITY** of utilities have updated rates since **AT LEAST 2016**.
- About **1 IN 6** utilities have not updated their rates since **2015** or earlier.



In North Carolina **most utilities** are actively evaluating and modifying their rate structures every one to two years. The EFC recommends that utilities review their rates **at least every two years**, at the minimum, to keep in pace with inflation. An annual or biennial review gives utilities the opportunity to evaluate if their current rates are enough to cover the necessary operating expenses and depreciation, not to mention savings goals for capital planning, emergencies, or other funds.

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 532 rate structures*.



*The year that rates became effective is known for 532 out of the 553 rate structures in the survey.

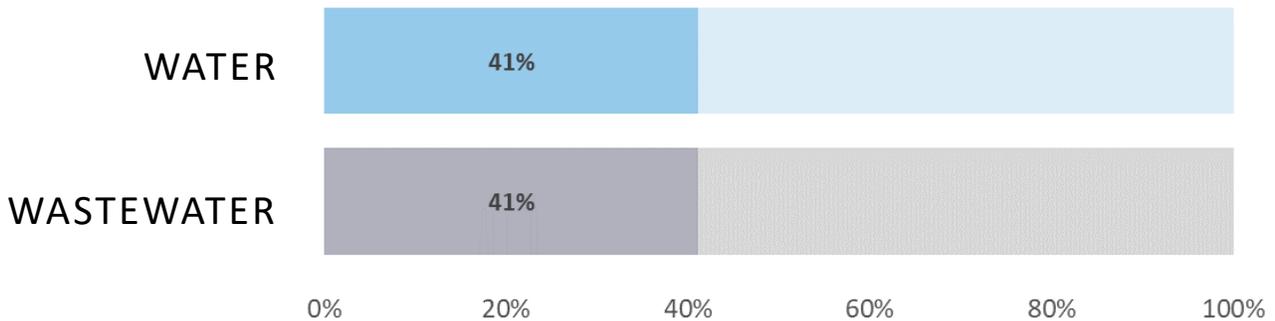
HOW HAVE RATES CHANGED?

The annual rates survey has been an ongoing partnership between the NC League of Municipalities and the EFC since 2006. As a result, years of rates data have been collected and are available to analyze trends and changes. As the 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 **presence** of a change as well as the **level** of that change is important when assessing revenue needs for utilities. The graphs below reflect changes in residential rates over the last fiscal year. Each graph reflects data from a cohort. The figures below only represent those rate structures present in both the 2019 and 2020 rates surveys.

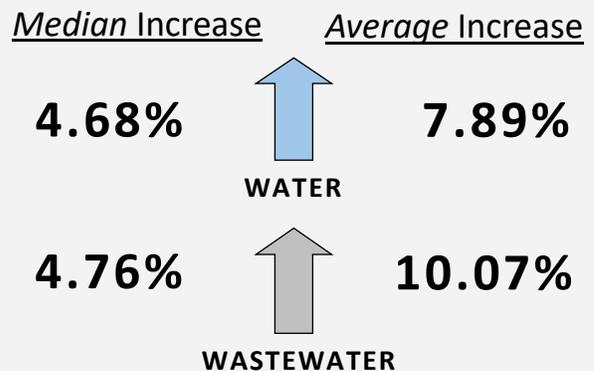
Percent of Rate Structures with Increased Residential Rates from 2019-2020

Water N=492 Rate Structures, Wastewater N=416 Rate Structures



Of those increased rate structures, the middle 50% of increases ranged from 2.5% to 9.4%. Given that in most cases bills are quite low, a large percentage rate increase may not translate to a large bill amount increase. **The median bill increase at 5,000 gallons for rate structures with increases was \$1.50 for water and \$2.00 for wastewater.**

Of Those Rate Structures with Increased Rates Since 2019, How Much Did They Increase?



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 their balance sheets. This year, financial data were available for **371 utilities** out of the total 495 utilities (75%). Before digging into the results of the data, 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.

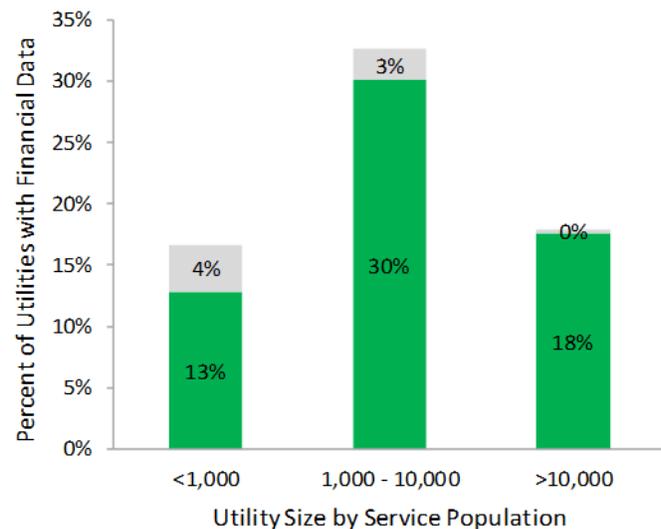
WHY INCLUDE DEPRECIATION?

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

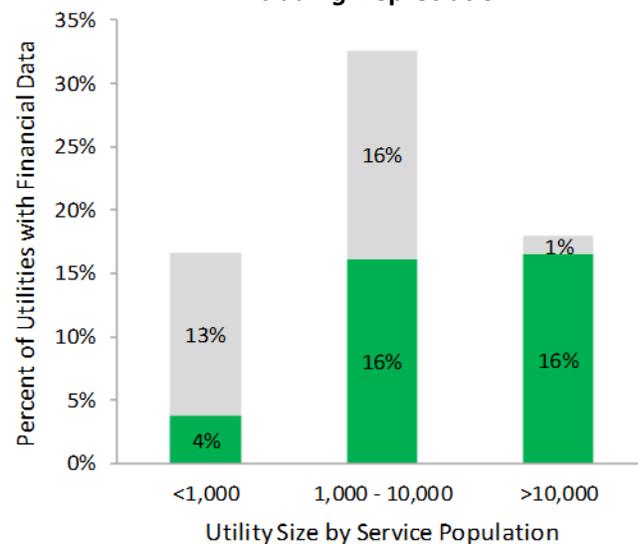
expense when the time comes to replace assets. Consider the differences in the graphs below with and without depreciation factored into operating expenses.

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

**Proportion of Utilities with Operating Ratio ≥ 1 ,
Excluding Depreciation**



**Proportion of Utilities with Operating Ratio ≥ 1 ,
Including Depreciation**



DO PRICES REFLECT THE TRUE COST OF SERVICE?

Without accounting for depreciation, **334 out of 371** utilities with financial data (90%) generated enough revenue to recover operating costs. Of the utilities that were not able to recover expenses, 35 out of 37 serve fewer than 10,000 people.

With depreciation included, **201 of the 371** (54%) utilities generated enough revenue to cover operating expenses. 162 out of 170 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.

In addition to utility size, other factors can be correlated to financial sustainability. Improved cost recovery and higher monthly bills are sometimes linked. Of those utilities with operating ratios of 1.0 or greater, **62% have combined bills (5,000 gallons/month) of \$70 or more. 97% of these utilities have combined bills (5,000 gallons/month) or \$45 or more.** In general, most combined monthly bills at 5,000 gallons of use are *at least* \$40.

WHAT IS CONSIDERED HEALTHY?

The Cost Recovery dial on the **Rates Dashboard** uses red, yellow, and green colors 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.

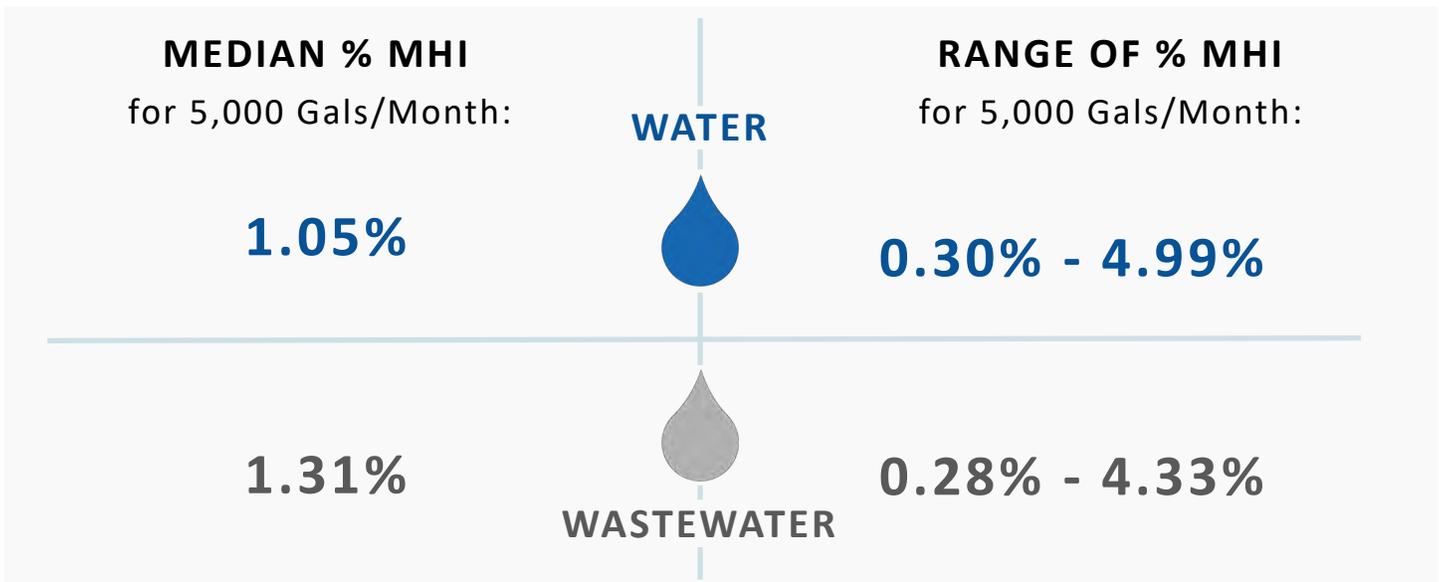
ADDITIONAL FINANCIAL DATA

The 2020 **Rates Dashboard** features more than 10 financial metrics, including **days cash on hand, quick ratio, asset depreciation**, and more! An example dial is shown below.



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**, or “**Percent 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. This includes households making less than or equal to the **federal poverty guideline, \$26,200 in 2020 for a family of four**, according to the US Department of Health and Human Services. In North Carolina, the 75th percentile water bill and wastewater bill equates to about **2% and 2.5% of income**, respectively, at the federal poverty guideline.

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.

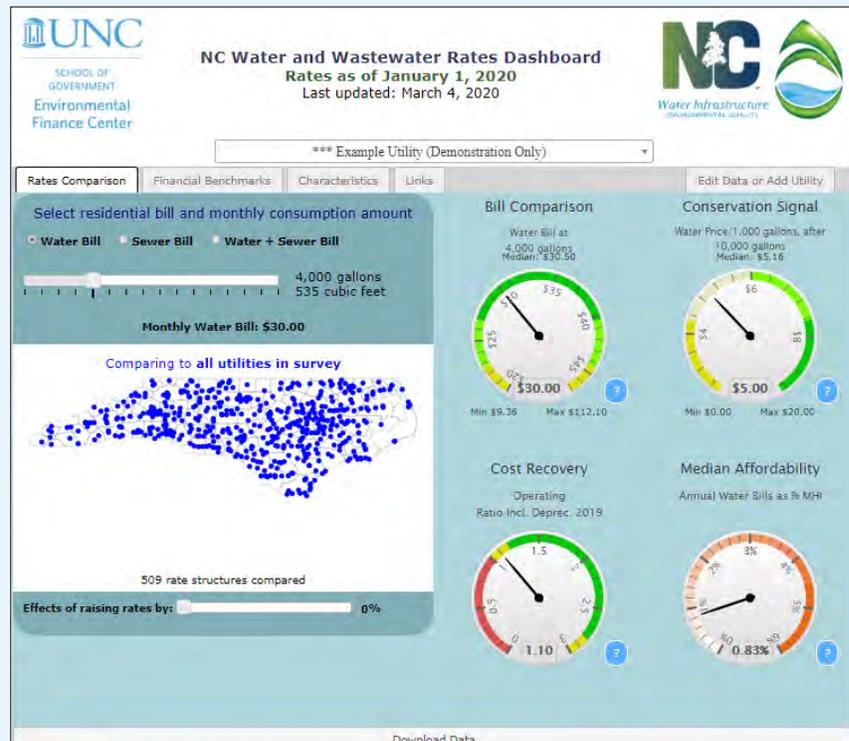
FURTHER RESOURCES

All of the following free resources are available at: go.unc.edu/nc

⇒ 2020 Water and Wastewater Rates Dashboard

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

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



QUESTIONS? FEEDBACK?



Chris Nida
 cnida@nclm.org
 (919) 715-4000



SCHOOL OF
 GOVERNMENT
 Environmental
 Finance Center

Annalee Harkins
 aharkins@unc.edu
 (919) 843-4958

ACKNOWLEDGMENTS

The Environmental Finance Center would like to thank the [North Carolina Department of Environmental Quality's Division of Water Infrastructure](#), the [North Carolina League of Municipalities](#), and all of the water and wastewater systems that participated in this year's survey. The EFC would also like to thank the [Local Government Commission](#) for the financial data presented both on the dashboard and in this report.

