

# An Overview of Water and Sewer Rates, Rate Structures and Rate Setting Practices in North Carolina

March 2006

*This document details results of a water and sewer rate and practices study conducted by the North Carolina League of Municipalities and the UNC School of Government's Environmental Finance Center. This document provides an analysis of rate setting patterns for municipal and non-municipal service providers in North Carolina. Additional reports will provide expanded analysis. For more information, please visit [www.nclm.org](http://www.nclm.org) and [www.efc.unc.edu](http://www.efc.unc.edu)*

## Introduction

Setting water and sewer rates is one of a local government's most important environmental and public health responsibilities. Water and sewer rates ultimately determine how much revenue a community will have to maintain vital public health facilities. The purpose of this document is to help utilities with their rate setting by providing up-to-date information on current statewide rate setting practices and trends.

The information presented in this document is part of a larger joint project by the North Carolina League of Municipalities (NCLM) and the UNC School of Government's Environmental Finance Center<sup>1</sup> (EFC) to help water and sewer utilities better serve their customers and assure the future integrity of their systems. As part of this project, NCLM and the EFC implemented a detailed survey that was completed by 277 utilities (217 municipal utilities and 60 non-municipal utilities). A summary of survey response data is enclosed with this report.

In addition, analysts collected, compiled, and studied 344 rate schedules from 333 utilities. Table 1 shows the composition of utilities whose rate structures were analyzed. Collectively, the utilities included in this study serve approximately 90 percent of public water and sewer consumers in the state.

Table 1: Number of Participating Utilities with Rate Data for FY 2005-2006

| <b>Institutional Arrangement</b> | <b>Provides Water and Sewer</b> | <b>Provides Water Only</b> | <b>Provides Sewer Only</b> | <b>Total</b> |
|----------------------------------|---------------------------------|----------------------------|----------------------------|--------------|
| Municipality                     | 248                             | 20                         | 7                          | 275          |
| County/District*                 | 10                              | 21                         | 1                          | 32           |
| Authority/Metropolitan District  | 2                               | 1                          | 1                          | 4            |
| Sanitary Districts               | 1                               | 4                          | 3                          | 8            |
| Not-for-profit                   | 0                               | 14                         | 0                          | 14           |
| <b>Total</b>                     | <b>261</b>                      | <b>60</b>                  | <b>12</b>                  | <b>333*</b>  |

*\* Several county systems operate in semi-autonomous county districts with separate rate schedules; there are 9 additional rate structures being used in these semi-autonomous districts. Furthermore, one utility employs 2 additional rate structures for customers who consumed greater amounts of water in the previous year than other customers. The 11 additional rate structures increase the number of total rate structures to 344 for the 333 utilities.*

A more detailed report that presents the comprehensive results of this study along with supplemental analyses incorporating community census data and finance data will be published in spring 2006.

<sup>1</sup> Partial funding for these efforts has been provided by the NC Water Resources Research Institute and the Urban Water Consortium.

**It is important to stress that an examination of rates and rate structures only tells a part of the story.** Pressure to maintain low or relatively low rates forces many utilities to run a deficit or avoid making necessary operational and capital expenditures. Ideally, rates should reflect the cost of providing service, which depends on diverse factors including size of treatment facilities, customer base, age of assets, type of water supply, and quality of receiving waters. Two neighboring utilities with similar customer bases may have very different costs that justify very different rates and rate structures. **Policy decisions drawn from the comparative information in this document should also consider many other factors such as age of system, geographic location, site-specific regulatory requirements, sources of water, demand, and availability of resources.**

**High rates do not necessarily reflect poor or inefficient management**—in fact; some utilities with low rates have done so at the expense of their assets by making short term sacrifices that are likely to have long term adverse cost and service impacts. The North Carolina Local Government Commission (LGC), in its annual compilation of municipal water and sewer financial indicators, found that many NC water utilities continue to collect insufficient revenues to cover their costs.

## Rate Setting Trends and Practices

A total of 277 utilities (217 municipal and 60 non-municipal) completed the rate practices survey. The following is an overview of some of the major rate setting trends and practices emerging from the study.

- 51 percent reported raising residential water rates and 55 percent reported raising residential sewer rates in FY05-06. The estimated average revenue increase for those that raised residential rates was approximately 7.2 percent for water and 8.15 percent for sewer service.
- 82 percent of utilities providing water service and 84 percent of utilities providing sewer service now review their rates on an annual basis.
- In designing rates and rate structures, 78 percent of utilities providing water service indicated that cost recovery or financial stability was the most important factor; 19 percent indicated that affordability was the primary concern, and 3 percent cited other reasons including conservation. Among utilities offering sewer service, 78 percent identified cost recovery or financial stability as the most important factor, while 20 percent indicated affordability and 2 percent other reasons.
- 85 percent reported reading meters on a monthly basis; 11 percent on a bimonthly basis, and 4 percent on a quarterly or other basis.
- Approximately 80 percent of municipal water utilities charge outside customers more than inside customers. According to the rate data, outside residential customers using 6,000 gallons of water pay approximately 158 percent of what inside residential customers pay.
- 67 percent charge commercial or industrial customers different water rates than residential customers; not all of these systems have separate commercial or industrial rate structures.
- 14 percent charge multi-family customers (apartments, condos, mobile home parks) different water rates than single family customers.
- 42 percent charge some type of impact or capacity charge to provide water to new customers.

## Overview of Rates and Rate Structures

Utilities employ a range of rate structures to determine what their customers pay each month. Almost all utilities use a combination of fixed charges and variable charges in their rate structures. However, there is considerable variation in how the fixed charges and variable charges are calculated and how they charge different classes of customers.

**Base Fees and Charges**

Many utilities have base charges that include a minimum amount of water consumption (or wastewater disposal), regardless of the amount actually used. For these utilities, the variable portion of the rate structure only takes effect when a customer uses more than the minimum included in the base charge. Other utilities charge a fixed monthly fee that does not include any consumption amounts. Charges that include consumption are often referred to as “minimums”. These are much less likely to be used by larger utilities, which favor fixed charges over minimum charges (Table 2). Of the 332 water rate structures, 238 use consumption-included minimum base charges and 92 use fixed charges. Among the 275 sewer rate structures, 162 rely on minimum charges and 100 use fixed charges.

Table 2: Types of Base Charges in Water and Sewer Rate Structures, by Utility Size

| Size of Utility<br>(number of<br>accounts) | Number of<br>Water Rate<br>Structures | Percentage of Water Rate<br>Structures Using    |                                      | Number of<br>Sewer Rate<br>Structures | Percentage of Sewer Rate<br>Structures Using    |                                      |
|--|---------------------------------------|---|--------------------------------------|---------------------------------------|---|--------------------------------------|
|  |                                       | Minimum<br>Charges<br>(Consumption<br>Included) | Fixed Charges<br>(No<br>Consumption) |                                       | Minimum<br>Charges<br>(Consumption<br>Included) | Fixed Charges<br>(No<br>Consumption) |
| 1 - 499                                    | 74                                    | 77%   | 22%                                  | 75                                    | 73%   | 24%                                  |
| 500 - 999                                  | 49                                    | 80%   | 20%                                  | 48                                    | 75%   | 25%                                  |
| 1,000 - 2,999                              | 88                                    | 82%   | 18%                                  | 72                                    | 64%   | 29%                                  |
| 3,000 - 7,499                              | 64                                    | 73%   | 25%                                  | 41                                    | 39%   | 54%                                  |
| 7,500 -14,999                              | 25                                    | 60%   | 40%                                  | 17                                    | 35%   | 59%                                  |
| 15,000+                                    | 32                                    | 25%   | 75%                                  | 19                                    | 5%  | 89%                                  |
| <b>All Rate<br/>Structures</b>             | <b>332</b>                            | <b>72%</b>                                      | <b>28%</b>                           | <b>275</b>                            | <b>59%</b>                                      | <b>36%</b>                           |

For utilities that include consumption in their base charges, the median amount included for water and sewer is 2,000 gallons per month. For those that include some consumption, the median “minimum” charge is \$11.74 per month for water and \$13.44 per month for sewer. For utilities those that do not include consumption, the median fixed charge for a single family household is \$7.50 per month for water and \$8.63 per month for sewer. Larger utilities generally charge their customers lower base fees than their smaller counterparts (Table 3).

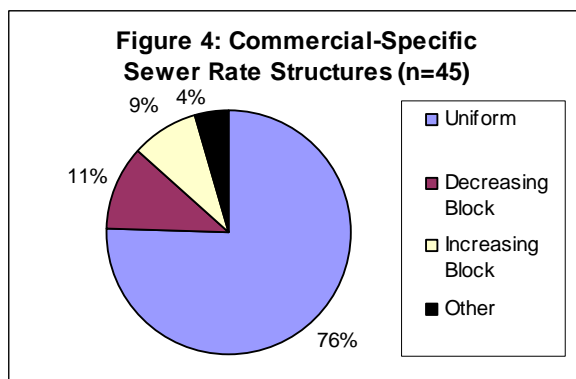
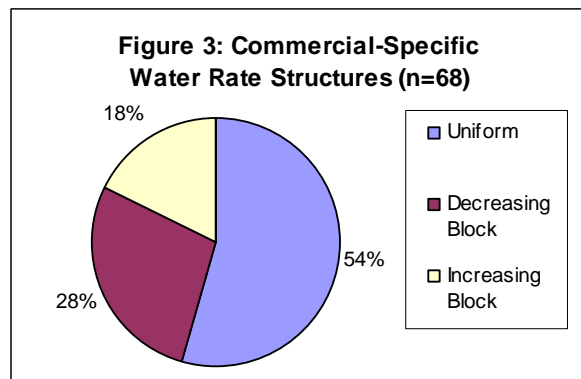
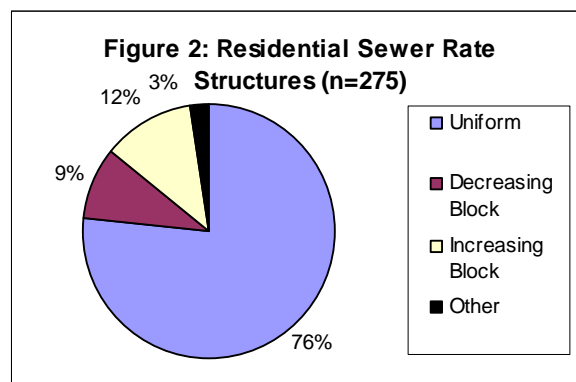
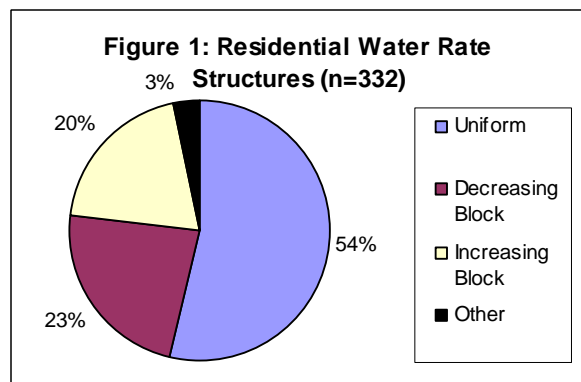
Table 3: Median Monthly Base Charges for Water and Sewer, by Utility Size

| Utility Size (Number<br>of Accounts) | Water Median Monthly Charge for              |                                   | Sewer Median Monthly Charge for              |                                   |
|--------------------------------------|--|-----------------------------------|--|-----------------------------------|
|                                      | Minimum Charges<br>(Consumption<br>Included) | Fixed Charges<br>(No Consumption) | Minimum Charges<br>(Consumption<br>Included) | Fixed Charges<br>(No Consumption) |
| 1 - 499                              | \$ 12.00                                     | \$ 11.00                          | \$ 15.45                                     | \$ 12.00                          |
| 500 - 999                            | \$ 11.00                                     | \$ 11.50                          | \$ 12.00                                     | \$ 12.00                          |
| 1,000 - 2,999                        | \$ 12.00                                     | \$ 8.30                           | \$ 13.81                                     | \$ 7.00                           |
| 3,000 - 7,499                        | \$ 10.50                                     | \$ 7.17                           | \$ 11.52                                     | \$ 7.56                           |
| 7,500 -14,999                        | \$ 14.41                                     | \$ 5.19                           | \$ 10.30                                     | \$ 8.98                           |
| 15,000+                              | \$ 9.00                                      | \$ 4.62                           | \$ 4.40                                      | \$ 3.80                           |
| <b>All Rate Structures</b>           | <b>\$ 11.74</b>                              | <b>\$ 7.50</b>                    | <b>\$ 13.44</b>                              | <b>\$ 8.63</b>                    |

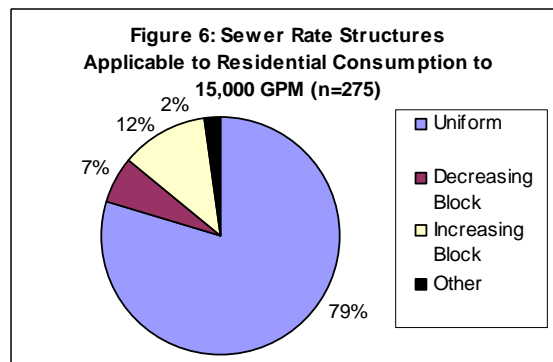
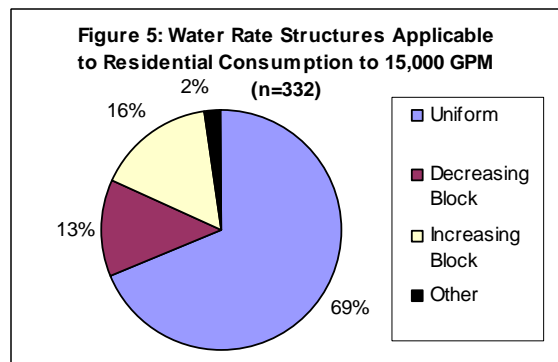
**Variable Charges: Uniform, Increasing Block, Decreasing Block, and Other Rate Structures**

Figures 1-4 present information on water and sewer rate structures for “inside” customers (those who live within a utility’s service boundaries). The three most common rate structures are uniform, increasing block, and decreasing block. A uniform rate structure exists when the rate at which water is charged does not change as the customer uses more water. An increasing block exists when the rate increases with greater water

consumption. This structure often underpins a water conservation strategy. A decreasing block structure reduces water rates as consumption rises – this often supports an economic development strategy. Other rate structures used in North Carolina include a hybrid of increasing and decreasing blocks where rates increase or decrease for specific targeted blocks of consumption amounts, seasonal uniform water rate structures applying different water rates at different times of the year, uniform rate structures with a cap on sewer consumption, flat monthly fees, and tiered flat fees based on consumption amounts. Seasonal uniform rate structures support conservation, especially for those utilities that experience great seasonal consumption changes (e.g. tourist locations). Flat fees are rarely used for single family residential customers, but often are applied to multi-user or mobile home consumers.



While some utilities design separate rates and rate structures for commercial users, (Figures 3 and 4), other utilities use only one rate structure for residential and commercial users but design the blocks in their rate structures to charge different rates for residential and commercial customers. A common practice is to set the first block to include all possible consumption levels for residential customers (thereby applying a uniform rate for these customers) while ensuring that most commercial customers exceed the first block. An examination of consumption levels between zero and 15,000 gallons per month (the average household in North Carolina consumes about 6,000 gallons per month) shows that the vast majority of utilities apply uniform water rates to charge residential customers (Figures 5 and 6). This analysis also reveals that utilities generally apply the same rate structure (predominantly uniform) to commercial and residential accounts.



Among the 332 water rate structures in the sample, the median water variable rate (not including base charges) for consumption levels between 5,000 and 10,000 gallons per month is about \$2.80/1,000 gallons; 90 percent of the water rate structures include a commodity rate that is between \$1.04 and \$5.50 per 1,000 gallons in that consumption range. The variable rate for sewer is higher and, among the 275 sewer rate structures in the sample, the median sewer variable rate (not including base charges) in the same consumption range is about \$3.45/1,000 gallons; 90 percent of the sewer rate structures include a commodity rate that is between \$1.51 and \$7.50 per 1,000 gallons.

### What Utilities Charge their Customers Each Month

#### Residential Water

Figure 7 shows the median amount utilities bill their residential water customers for different consumption amounts on a monthly basis<sup>2</sup>. The charts also show what utilities in the 10<sup>th</sup> (lower) and 90<sup>th</sup> (upper) percentiles charge for water and sewer service. These amounts include all fixed and consumption-based minimum base charges. The median monthly amount charged for zero gallons of water is \$10.30, \$22.96 for 6,000 gallons, and \$34.58 for 10,000 gallons.

Table 4 demonstrates that the median water bills among the largest utilities are smaller than those of smaller utilities. Table 5 shows that municipal utilities generally have lower median residential water bills than other service providers.

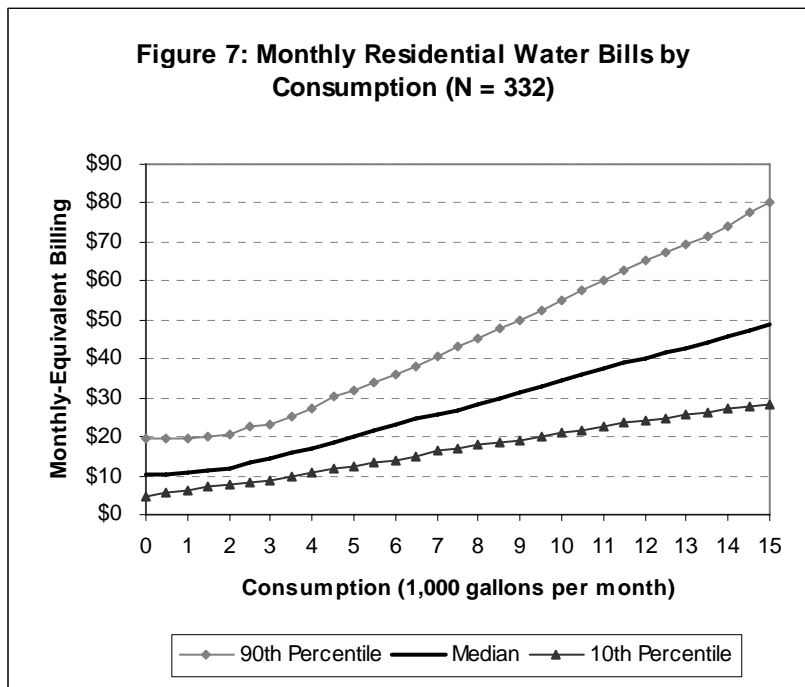


Table 4: Median Water Bill by Utility Size (6,000 Gallons/Month)

| Utility Size (Number of Accounts) | Median Bill    |
|-----------------------------------|----------------|
| 1 - 499                           | \$23.13        |
| 500 - 999                         | \$24.65        |
| 1,000 - 2,999                     | \$22.88        |
| 3,000 - 7,499                     | \$23.30        |
| 7,500 - 14,999                    | \$22.60        |
| 15,000+                           | \$20.93        |
| <b>All Rate Structures</b>        | <b>\$22.96</b> |

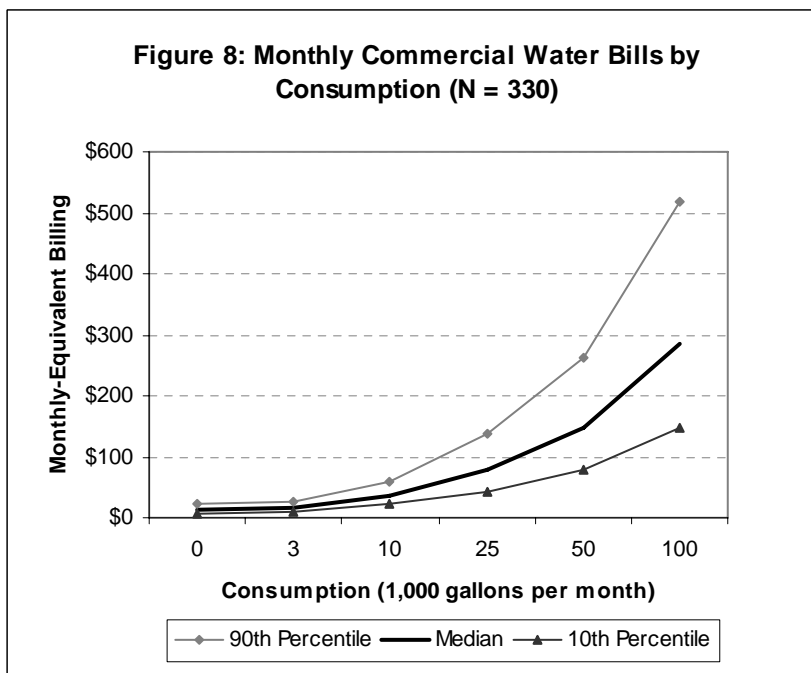
Table 5: Median Water Bill by Utility Type (6,000 Gallons/Month)

| Utility Type                    | Number of Water Rate Structures | Median Bill     |
|---------------------------------|---------------------------------|-----------------|
| Authority/Metropolitan District | 4                               | \$ 23.64        |
| County/District                 | 39                              | \$ 33.00        |
| Municipality                    | 268                             | \$ 21.40        |
| Not-for-Profit                  | 14                              | \$ 26.67        |
| Sanitary District               | 7                               | \$ 27.00        |
| <b>All Systems</b>              | <b>332</b>                      | <b>\$ 22.96</b> |

<sup>2</sup> For utilities that bill on a non-monthly basis (bi-monthly or quarterly), charges have been calculated and presented on a monthly basis to allow for comparison.

**Commercial Water**

Figure 8 shows monthly median water bills for commercial water customers at different levels of consumption. Median bills for those in the 10<sup>th</sup> and 90<sup>th</sup> percentiles are also included. The median monthly bill for inside customers consuming zero gallons is \$12.00. Median bills for 25,000 gallons total \$78.20 and \$285.44 for those consuming 100,000 gallons. Sixty-seven water utilities designed and specified unique rates for commercial customers.



**Residential Sewer**

Figure 9 presents information on median monthly sewer bills at various consumption levels. The median monthly sewer bill for customers consuming zero gallons of water is \$ 11.24. At 6,000 gallons, median bills rise to \$27.83. Median bills for 10,000 gallons total \$41.42. Tables 6 and 7 show differences in median residential sewer bills by utility size and type.

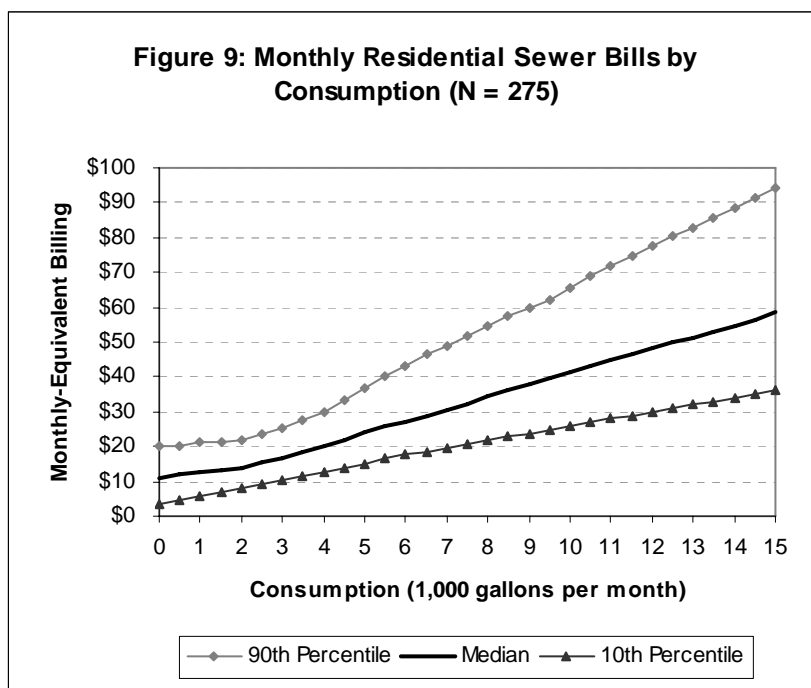


Table 6: Median Sewer Bill by Utility Size (6,000 gallons/month)

| Number of Accounts         | Median Bill    |
|----------------------------|----------------|
| 1 – 499                    | \$29.75        |
| 500 – 999                  | \$26.63        |
| 1,000 - 2,999              | \$26.64        |
| 3,000 - 7,499              | \$25.70        |
| 7,500 -14,999              | \$27.06        |
| 15,000+                    | \$27.45        |
| <b>All Rate Structures</b> | <b>\$27.12</b> |

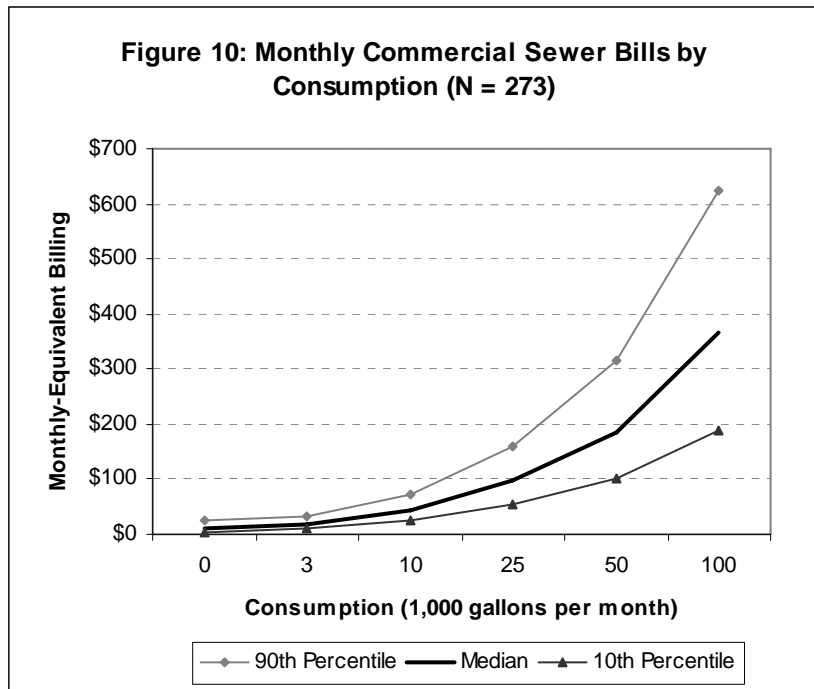
Table 7: Median Sewer Bill by Utility Type (6,000 gallons/month)

| Utility Type                    | Number of Sewer Rate Structures | Median Bill    |
|---------------------------------|---------------------------------|----------------|
| Authority/Metropolitan District | 4                               | \$29.48        |
| County/District                 | 12                              | \$30.83        |
| Municipality                    | 255                             | \$26.95        |
| Not-for-Profit                  | 0                               | N/A            |
| Sanitary District               | 4                               | \$41.00        |
| <b>All Systems</b>              | <b>275</b>                      | <b>\$27.12</b> |

**Commercial Sewer**

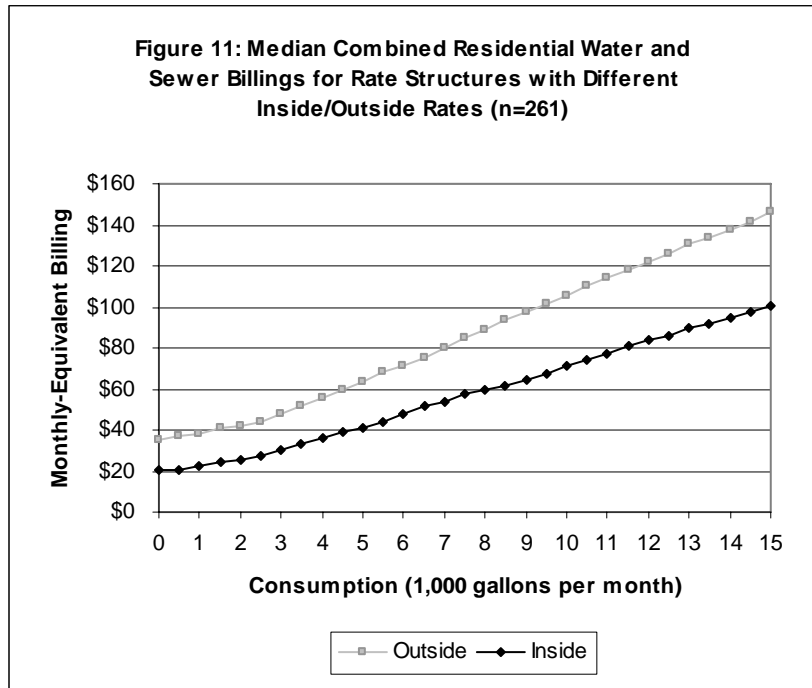
Figure 10 depicts the estimated monthly sewer bills for inside commercial customers at different consumption levels. Median bills for commercial customers are \$12.50 for zero consumption, \$98.37 at 25,000 gallons and \$365.62 at 100,000 gallons. Forty-five sewer utilities charge separate rates for commercial customers.

**Figure 10: Monthly Commercial Sewer Bills by Consumption (N = 273)**



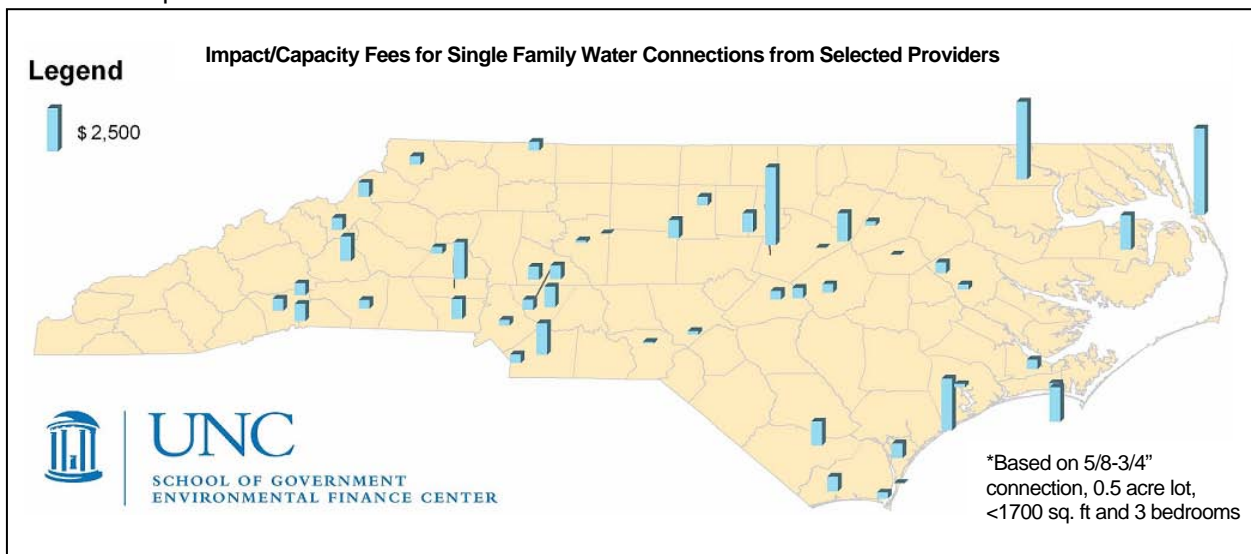
### What Utilities Charge Customers that Live Outside their Political Boundaries (Inside vs. Outside)

All of the charges presented above refer to what utilities charge customers that live within their political boundaries. Municipal utilities often serve customers that live outside of city limits, and approximately 80 percent of these utilities charge outside customers higher rates than inside customers. Figure 11 shows the median amounts charged for combined residential water and sewer service for all utilities that charge different rates to outside customers. The median charged to inside customers for combined water and sewer for 6,000 gallons per month is \$47.50 compared to \$71.61 charged for outside customers.



### Impact and Capacity Charges

The terminology of one-time charges in North Carolina is not standard, and utilities use many different names to refer to up-front charges that are designed to generate revenue to help utilities offset the impact of serving the new customers. These charges are different from one-time charges that are designed to cover the direct costs of installing new service such as meter, tap on, and boring costs. As a result, documenting the use of these charges across North Carolina in a uniform manner is difficult and no effort has been made to determine how many utilities use these charges. The attached map shows examples of the charges and their relative amounts for a single family home across the state. More information on impact charges will be available in a forthcoming NCLM/EFC publication.





Contents of Attached Tables

**Table 8: Residential Monthly Water Bills at Various Consumption Levels (Includes Fixed Charges)**

- Service Provider and Number of Accounts
- Inside and Outside Monthly Billing Totals at 0, 3,000, 6,000, 10,000 and 15,000 Gallons per Month Water Consumption

**Table 9: Residential Water Rate Structures**

- Service Provider and Number of Accounts
- Water Rate Structure
- Number of Water Blocks
- Ratio of Outside Billing to Inside Billing at 6,000 Gallons per Month Water Consumption
- Meter Size Used in Calculating Billings
- Monthly Minimum Consumption Charge and Fixed Charge (Inside, Outside, Gallons Provided)

**Table 10: Residential Monthly Sewer Bills at Various Consumption Levels (Includes Fixed Charges)**

- Service Provider and Number of Accounts
- Inside and Outside Monthly Billing Totals at 0, 3,000, 6,000, 10,000 and 15,000 Gallons per Month Water Consumption

**Table 11: Residential Sewer Rate Structures**

- Service Provider and Number of Accounts
- Sewer Rate Structure
- Number of Sewer Blocks
- Ratio of Outside Billing to Inside Billing at 6,000 Gallons per Month Water Consumption
- Meter Size Used in Calculating Billings
- Monthly Minimum Consumption Charge and Fixed Charge (Inside, Outside, Gallons Provided)

**Table 12: Commercial Monthly Water Bills at Various Consumption Levels (Includes Fixed Charges)**

- Service Provider and Number of Accounts
- Water Rate Structure Specific to Commercial Customers\*
- Meter Size Used in Calculating Billings
- Inside and Outside Monthly Billing Totals at 0, 3,000, 10,000, 25,000, 50,000, 100,000 and 250,000 Gallons per Month Water Consumption

**Table 13: Utilities with Water Rate Structures Specific to Commercial Customers\*\***

- Service Provider and Number of Accounts
- Water Rate Structure Specific to Commercial Customers
- Number of Water Blocks
- Ratio of Outside Billing to Inside Billing at 25,000 Gallons per Month Water Consumption
- Meter Size Used in Calculating Billings
- Monthly Minimum Consumption Charge and Fixed Charge (Inside, Outside, Gallons Provided)

**Table 14: Commercial Monthly Sewer Bills at Various Consumption Levels (Includes Fixed Charges)**

- Service Provider and Number of Accounts
- Sewer Rate Structure Specific to Commercial Customers\*
- Meter Size Used in Calculating Billings
- Inside and Outside Monthly Billing Totals at 0, 3,000, 10,000, 25,000, 50,000, 100,000 and 250,000 Gallons per Month Water Consumption

**Table 15: Utilities with Sewer Rate Structures Specific to Commercial Customers\*\***

- Service Provider and Number of Accounts
- Sewer Rate Structure Specific to Commercial Customers
- Number of Sewer Blocks
- Ratio of Outside Billing to Inside Billing at 25,000 Gallons per Month Water Consumption
- Meter Size Used in Calculating Billings
- Monthly Minimum Consumption Charge and Fixed Charge (Inside, Outside, Gallons Provided)

*\* The residential rate structure is used to calculate the billings for commercial customers except for the service providers that specify different rates and rate structures for commercial or non-residential customers.*

*\*\* Only rate structures that are specific to commercial or non-residential customers are included in these tables. All other utilities use the same rate structure listed in the residential tables (Tables 9 and 11).*

Notes Regarding Tables 8-15

1. Utility size includes residential and non-residential accounts. Where no data was reported on number of accounts, utility size was designated as one third of the 2004 municipal population.
2. Outside billings and ratios are reported only for service providers that charge different rates for customers living outside the municipal boundary/service area.
3. If a service provider assigns a different minimum consumption or fixed charge to different meter sizes, this analysis included the charge assigned to the smallest available meter (for residential billings only).
4. All billings, fixed charges, minimum charges, gallons of base consumption provided are computed and reported at the monthly level. Billing periods are assumed to be monthly when no billing period information was provided.
5. All charges and fees are combined and classified as a single "minimum charge" if a base consumption is included, or as a single "fixed charge" if no consumption is provided.
6. Sanitation/trash collection fees are not included.
7. The majority of rate sheets were collected from September 2005 to November 2005. Some rate sheets were collected in January 2006.
8. Residential rates include single residential household rates and do not include commercial, multi-user, apartments, mobile home, irrigation, unmetered, sewer-only or water-only special rates. Commercial rates include commercial, business or non-residential rates (but not industrial rates), or are the same as residential rates if none of the above are specified.
9. No outside billing totals are reported for utilities that do not list an outside rate. This does not mean that the utility has no outside customers.
10. Water-only and sewer-only utilities are listed in all tables, but with information reported only in the appropriate tables.
11. OWASA and Dare County billing totals include the lower non-seasonal rate as opposed to the higher seasonal rate.