North Carolina Stormwater Fees Report:

2021-2022

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UNC SCHOOL OF GOVERNMENT
Environmental Finance Center

ABOUT THIS REPORT

The Environmental Finance Center (EFC), with the support of the North Carolina Department of Environmental Quality (DEQ), and Division of Water Infrastructure (DWI) conducted a survey of stormwater utilities in North Carolina for fiscal year 2022 which began July 1, 2021. Ninety-eight stormwater utilities across the state are included in this survey. Utility fees were confirmed via websites, local government budgets, local government fee schedules, or direct contact via phone or email. Since three utilities have multiple fee structures, there are 101 fee structures included in the survey. This survey includes every known stormwater utility in the state of North Carolina. Ninety-three (95 percent) of the participating utilities are municipalities, while five (5 percent) of the participating utilities are counties.

The following pages contain the results and analyses of the 2021-2022 North Carolina Stormwater Fees Survey. More information on stormwater utility management in North Carolina can be found here. In addition to this report, there is an accompanying set of tables and an online, interactive Fees Dashboard where users can compare utilities against various attributes such as geographic location, system characteristics, and NPDES MS4 permit status.

The Environmental Finance Center would like to extend a thank you to the Department of Environmental Quality, Division of Water Infrastructure, North Carolina League of Municipalities, Stormwater Association of North Carolina, and the stormwater utilities that participated in this year's survey.

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Stormwater Fee Structures

What are common stormwater fee structures?

Flat Fees

Utilities that use flat fees charge all properties the same fee regardless of the estimated amount of impervious surface on the property. Communities might implement a flat fee for residential customers because residential parcels within the city's jurisdiction do not vary significantly in size. This eliminates the city or county's need to estimate the size of each parcel individually, cutting down on data collection and administration costs. Prior to the establishment of a stormwater utility, many communities conduct studies to determine the average size of a residential parcel. In North Carolina, about 64 percent of the 72 utilities that implement a residential flat fee structure charge nonresidential customers using a different structure. In the example provided above in Table 1 and Equation 1, all residential customers are charged $4.00 per month.

Table 1: Residential flat fee example

Residential Flat Fee Per Month
$4.00

Equation 1: Example calculation for 3,000 ft² of impervious surface

All Properties Pay the Same Fee

$$Monthly\ Fee = \$4.00$$

Tiered Flat Fees

Properties that are charged based on tiered flat fees are assessed a fee based on the estimated amount of impervious surface on the parcel. However, unlike per ERU fee structures, the amount of impervious surface on a parcel is not multiplied by the size of an ERU. Instead, each property is categorized into a single tier based on the amount of impervious surface estimated to be within that parcel. Thus, within the fee structure illustrated in Table 2, a property with 1,900 square feet of impervious surface will pay the same fee as a property with 4,900 square feet of impervious surface. Typically, tiered flat fee structures will create small, medium, and large categories for properties, but some utilities may have more than three tiers. In the example provided in Equation 2 and Figure 1, a property with 3,000 square feet of impervious surface will fall in the "medium" category and pay a fee of $2.50 per month. This is an example of a tiered flat fees fee structure with three tiers.

Table 2: Tiered Flat Fees Example Fee Structure

Single Family	Monthly Fee
Less than 1,500 ft^2	$1.50
1,500 ft^2 – 4,999 ft^2	$3.00
5,000 ft^2 or more	$4.50

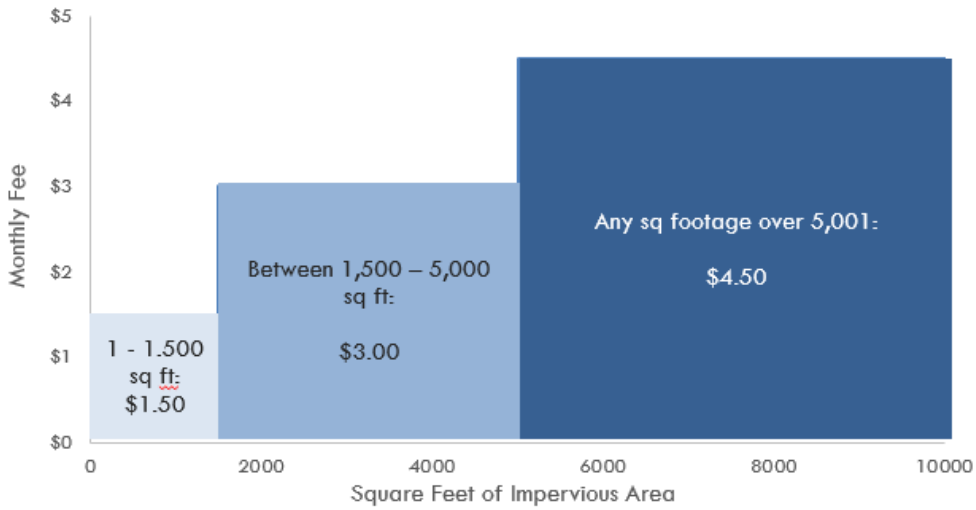
Equation 2: Example Calculation at 3,000 ft^2 of Impervious Surface

$$1{,}500 ft^2 < 3{,}000\ ft^2 < 4{,}999 ft^2$$

$$Monthly\ Fee = \$3.00$$

Figure 1 provides a visual representation of how tiered flat fees are charged. The horizontal axis displays the impervious service on a fee payer's property, while the vertical axis displays the monthly fee owed. As impervious surface increases along the horizontal axis, the fee only changes when passing 1,500 ft^2 and 5,000 ft^2.

Figure 1: Tiered flat fee example fee structure visualized



Per Equivalent Residential Unit

Properties that are charged per Equivalent Residential Unit (per ERU) are assessed a fee based on the estimated amount of impervious surface on the property. A "per ERU" stormwater fee structure may have a base charge which may or may not include a certain number of square feet of impervious surface. Additionally, a utility may have a "per ERU" with a cap fee structure. For example, a cap of 4,000 square feet means any residential property with more than 4,000 square feet of impervious surface will be charged for 4,000 square feet. Stormwater utilities with "per ERU" fees structures estimate the amount of impervious surface on individual properties using GIS or other methods. The area of impervious surface on a property is divided by the size of the ERU to get the number of ERUs on that property. A utility may also round up or down to the nearest ERU. The number of ERUs, rounded or not, is then multiplied by the price per ERU to get the stormwater fee owed for the individual

property. In the example calculation provides below in Table 3 and Equation 3, a property with 3,000 square feet of impervious surface will pay a fee of $4.44 per month because it is 1.11 ERUs.

Table 3: Example fee per ERU

ERU Size	Monthly Fee Per ERU
2,700 square ft.	$4.00

Equation 3: Example calculation at 3,000 ft² of impervious surface

$$\frac{3{,}000\ ft^2}{2{,}700\ ft^2\ per\ ERU} = 1.11\ ERU$$

$$1.11\ ERU * \$4.00\ per\ ERU = \$4.44\ fee\ per\ month$$

How are stormwater fees structured in North Carolina?

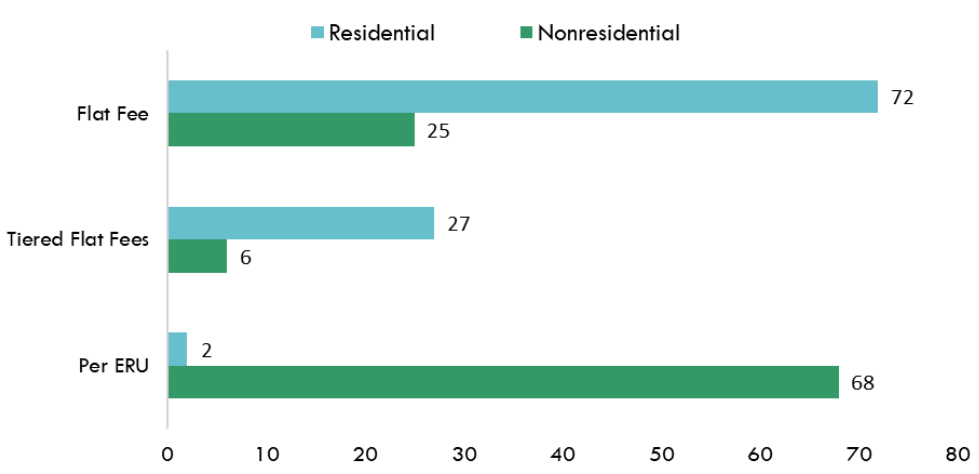
Residential fee structures

Residential fee structures in North Carolina are mostly flat fee. About 72 percent of residential fee structures are flat fee. Additionally, tiered flat fees are more common for single-family residential properties than nonresidential properties (Figure 1).

Non-residential fee structures

Nonresidential fee structures are mostly per ERU (Figure 2). Why not charge a flat fee for nonresidential customers? While residential parcel sizes tend to have similar impervious surface areas to one another, the variation in impervious surface area for nonresidential parcels can be quite large. Nonresidential parcels may be as large as a shopping mall or as small as a restaurant. Thus, charging per ERU ensures that each nonresidential establishment pays a fee proportional to the amount of impervious surface on the parcel.

Figure 2: Stormwater fee structures by structure type (n=101)



Stormwater Monthly Billing

Residential monthly bills

Table 4 shows that at 3,000 square feet of impervious surface, the median monthly residential stormwater bill is $4.85. The median bill at 6,000 square feet of impervious surface is $5.00, just a $0.15 increase from the median bill at 3,000 square feet. These impervious surface areas are intended to show the difference in the bill for an average home and a large sized home.

Table 4: Residential minimum, median, and maximum Bills at 3,000 and 6,000 ft² of impervious surface

	3,000 ft²	6,000 ft²
Minimum	$0.50	$0.50
Median	$4.85	$5.00
Maximum	$16.50	$26.84

Figure 3: Monthly residential stormwater fees at 3,000 ft² of impervious surface (n = 101)

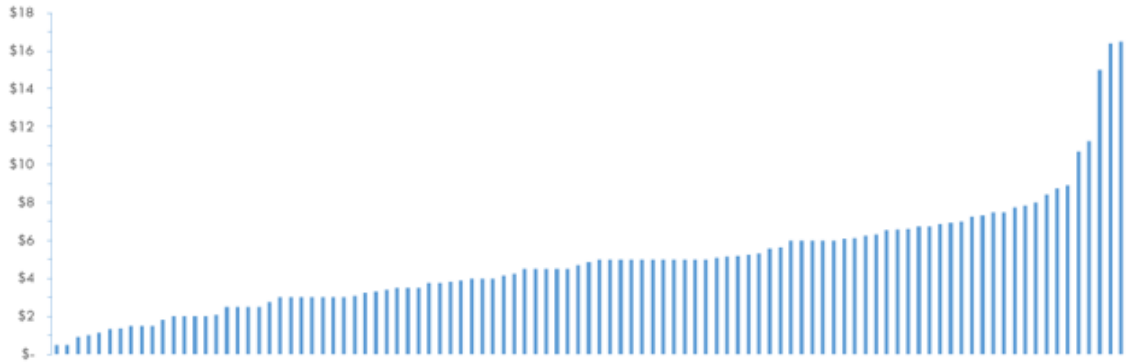


Figure 3 displays the individual single-family residential stormwater monthly bill amount for each fee structure at 3,000 square feet of impervious surface. Note that these comparisons do not include level of service (LOS) provided, which can vary widely based on the stormwater utility's goals, regulatory mandates, service area, and population. LOS is a general term used to describe the stormwater service a utility provides. A utility with a high LOS may be constructing and maintaining stormwater control measures as well as implementing programs such as floodplain buyouts. A utility with a lower LOS may be focused on the minimum practices needed to achieve regulatory compliance.

Multi-family monthly bills

Table 5 displays summary data for 61 fee structures that charge multi-family properties unique fees from single-family residential. For four living units, or 6,000 square feet for utilities, the median bill is $13.17. The median bill at 10 units or 15,000 square feet of impervious surface increases to $30.00.

Table 5: Multi-family minimum, median, and maximum bills at 4 and 10 Units

	4 Units (6,000 ft²)	10 Units (15,000 ft²)
Minimum	$0.57	$0.91
Median	$13.17	$30.00
Maximum	$49.50	$132.00

Figure 4: Monthly multi-family stormwater fees at 4 units (Estimated 6,000 sq ft of impervious surface) (n = 61)

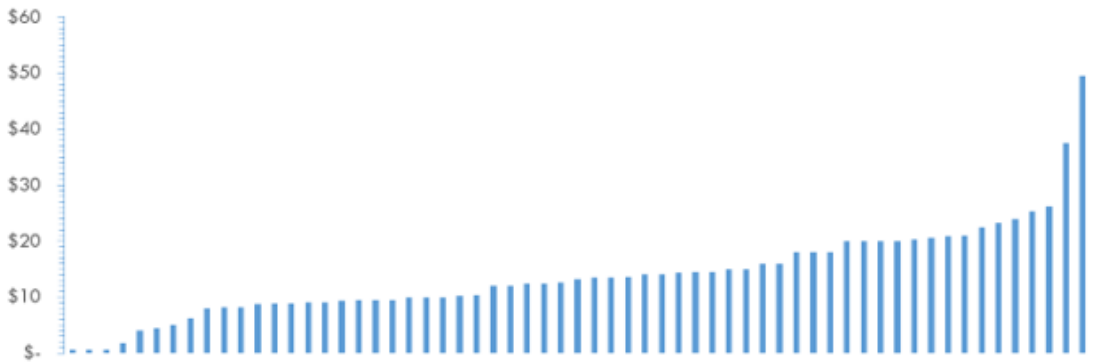


Figure 4 displays the individual multi-family residential stormwater monthly bill amount for each fee structure at four living units or 6,000 square feet of impervious surface. Note that these comparisons do not include level of service provided, which can vary widely based on the stormwater utility's goals, regulatory mandates, service area, and population.

Nonresidential monthly bills

Table 6 shows that at 10,000 square feet of impervious surface for nonresidential properties the median monthly bill is $11.13 per month. At 50,000 square feet of impervious surface the median bill is $71.25.

Table 6: Nonresidential minimum, median, and maximum bills at 10,000 and 50,000 ft² of impervious surface

	10,000 ft²	50,000 ft²
Minimum	**$0.60**	**$1.00**
Median	**$11.13**	**$71.25**
Maximum	**$66.00**	**$412.50**

Figure 5: Monthly nonresidential stormwater fees at 10,000 square feet of impervious surface (n = 101)

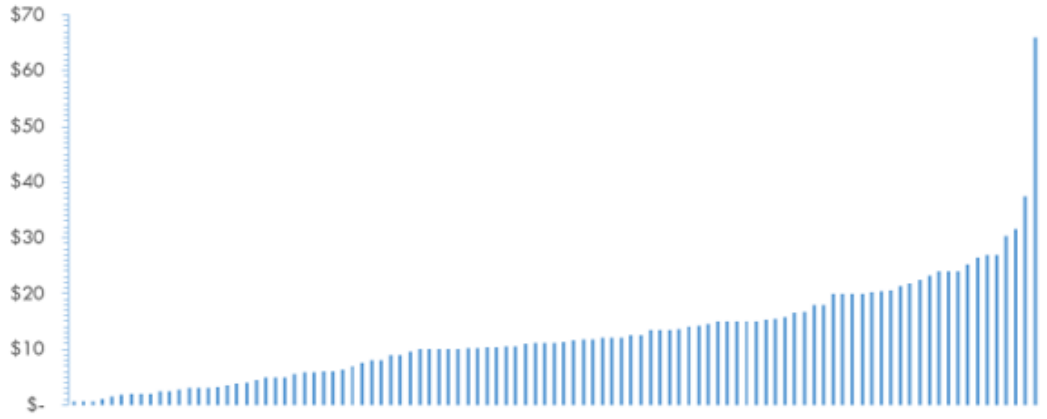


Figure 5 displays the individual nonresidential stormwater monthly bill amount for each fee structure at 10,000 square feet of impervious surface. Again, note that these comparisons do not include level of service provided, which can vary widely based on the stormwater utility's goals, regulatory mandates, service area, and population.

Trends in residential fee changes

Between fiscal year 2020 and fiscal year 2022, thirty utilities raised residential stormwater fees, representing 33 percent of the utilities that were included in both surveys. This indicates that stormwater utilities have been actively evaluating their stormwater funding needs. The average increase in monthly residential bill at 3,000 square feet of impervious surface was $1.46. Fee increases ranged from $0.16 to $6.29. The median bill for all utilities at 3,000 square feet of impervious surface has increased from $4.12 in FY2020 to $4.85 in FY2022. Interestingly, since 2019 two local governments have stopped charging a stormwater fee and resumed paying for stormwater management from general fund dollars.

30 Utilities increased fees since 2020

3 New utilities in fiscal year 2022

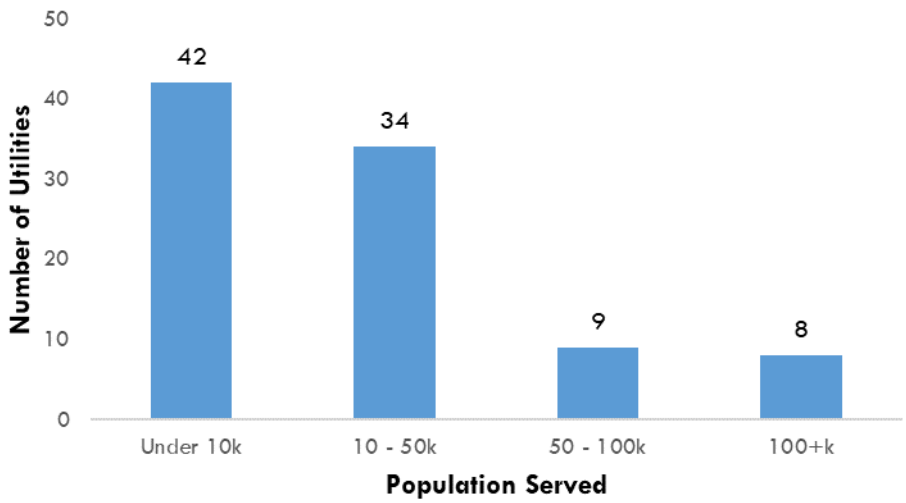
Supplementary utility information

Population served by municipalities

There are 93 municipalities and five counties in the state with stormwater utilities. Since counties serve unincorporated areas, it is difficult to estimate the utility service population for each of the county stormwater utilities. Thus, this brief analysis focuses on municipalities.

Most of the municipal stormwater utilities in North Carolina have service populations under 50,000 people. Charlotte, serving just under 800,000 people, has the largest stormwater service population in the state. Bald Head Island has the smallest service population, servicing just 205 people.[1] In total, the 93 municipal participating utilities service 4 million of the 10.5 million North Carolinians, representing 39 percent of the population of North Carolina. Including the County utilities more than 40 percent of North Carolinians are charged a stormwater fee.

Figure 7: Service populations of municipal stormwater utilities (n = 93)



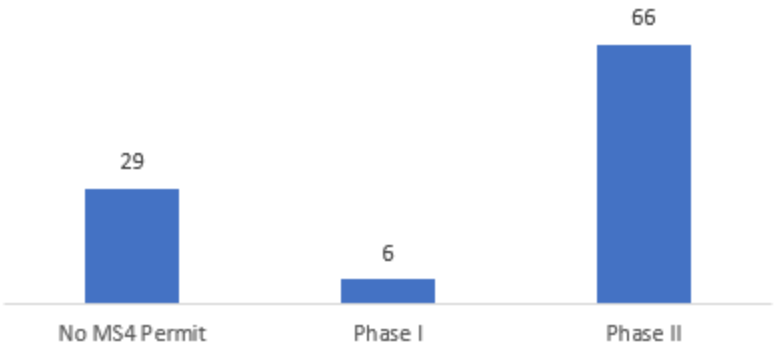
NPDES MS4 permitting

An MS4 permit (Municipal Separate Storm Sewer System) is issued to a municipality under the National Pollutant Discharge Elimination System (NPDES). Based on EPA polices, Phase I communities are larger municipal separate stormwater systems that generally serve populations over 100,000, have a greater number of acres disturbed by development, or have certain types of industrial activities. These entities have been required to have stormwater permits and maintain stormwater management programs (SWMPs) since 1990. Smaller municipalities may be issued Phase II MS4 permits and be required to maintain similar SWMPs. Within this survey, six of the stormwater utilities (6 percent) have Phase I MS4 permits, while 66 (65 percent) have Phase II. Seventy-one percent of the stormwater utilities that participated in this survey are municipalities and counties with MS4 permits. The remaining stormwater utilities exist in counties or municipalities that do not have MS4 permits (Figure 8). These communities have elected

[1] Based on the 2019 US Census Bureau American Community Survey.

to create a stormwater utility to manage their stormwater challenges in the absence of the regulatory pressures associated with the NPDES program.

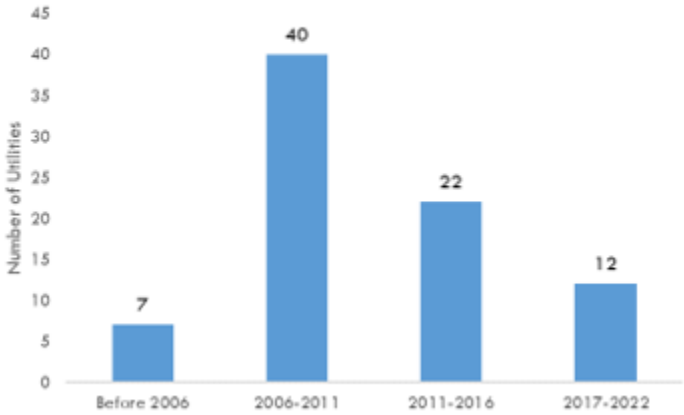
Figure 8: NPDES Permit categories (n = 101)



Year of utility creation

The first stormwater utility in North Carolina was created in 1993 in the city of Charlotte. Figure 9 shows the years of utility creation for the 81 utilities in the survey for which a year is known. Most of the existing utilities were established in the mid-2000's. Three utilities began charging a stormwater fee first the first time in FY2021-2022.

Figure 9: Year of stormwater utility creation (n = 81)

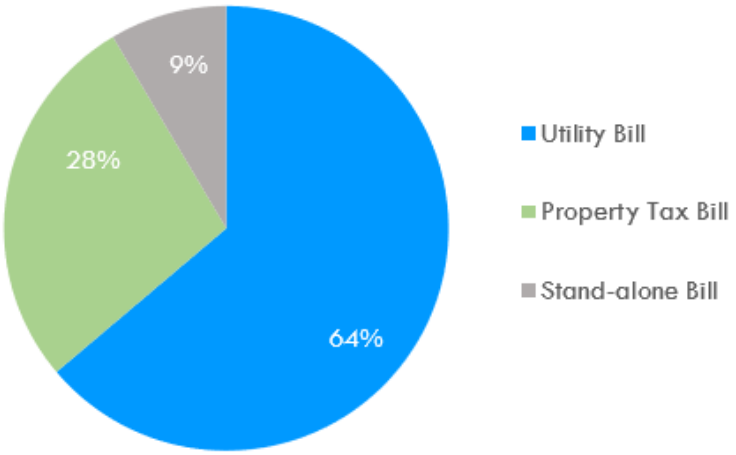


Billing methods

Stormwater utilities can charge for their services through a variety of methods. In North Carolina, 64 percent of stormwater utilities charge their customers through a combined utility bill as their primary method of fee collection. However, not every stormwater utility operates in a county or municipality that offers water, sewer, or electric service. Therefore, some utilities rely on other methods of fee collection.

Stormwater utilities that bill for their services on the county or municipality's utility bill may still have to send separate stand-alone bills to fee payers that are not connected to other utility systems. Nine percent of utilities charge their customers on a stand-alone bill. Stand-alone billing may increase administrative costs for a utility because of the need to send out separate bills to each customer. An additional 28 percent of stormwater utilities charge for their services on the customer's property tax bill (Figure 10).

Figure 10: Billing method of stormwater utilities (n = 94)



Additional Resources for North Carolina Stormwater Utilities

This report is one of a series of stormwater fees and stormwater fee structures surveys in North Carolina, compiled by the North Carolina Department of Environmental Quality, Division of Water Infrastructure, and the EFC. Visit https://efc.sog.unc.edu/resource/north-carolina-stormwater-resources/ where, in addition to survey results, you will also be able to access the free, interactive fee dashboard which facilitates fee comparisons among utilities normalizes fee revenue by service population to compare utility fee revenue per capita.

For more information on making appropriate fee comparisons, please contact Evan Kirk (emkirk@sog.unc.edu).

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