



Water Rate Structures and Rate Setting



This program is made possible under a cooperative agreement with EPA.

www.efcnetwork.org





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“This part of the plan will be funded with all the unused money we must have laying around someplace.”



Session Objectives

- Understand how to pay for the costs of running your water system
- Look more closely at your rates and rate structure designs



Systems Love Low Rates, but...

Government | City Services | About Us

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News Flash - All

News Flash - Home

Low Water and Sewer Rates
January 8, 2007

Once again, the City of [redacted] and sewage rates in [redacted] recent s[redacted] providers to evalu[redacted] rates residents p[redacted] City of [redacted] is proud to say, based on [redacted] household, the City has the third lowest water and [redacted] bill of \$15.38, and sewage bill of \$10.36. As a result, [redacted] proved to have the third lowest combined residential water and sewage rates, of the 63 polled.

The commercial rates were also compared among the same providers, based on 150,000 gallons per month. [redacted] has the lowest sewage, as well as the lowest combined water and sewage rates of those polled. The average commercial monthly sewage bill is \$222.00, with the combined

Job Openings
Citizen Survey Results
Council Agenda
Comprehensive Planning Information
Community Assessment
E-News Signup

Certified City of Ethics
CITY EXCELLENCE

“Once again, the [City’s] Water Department proved to have some of the lowest water and sewage rates in the state.”



Are we following the applicable laws?

Will it provide sufficient cost recovery?

What exactly does this include?

Will revenues be resilient to changing water demands?

Are we allocating the costs to the right customers?

Do these rates send the right signals to our customers, based on our objectives?

Will our customers understand these rates?

Will our customers be able to pay these rates?





“Ideal” Pricing Has Several Characteristics

Sometimes Those Characteristics Conflict

- Prices cover full “costs” of service
- Prices send and reinforce strategic messages
- Prices follow State’s laws and policies
- Beneficiaries pay for their benefits
- Ability to pay is recognized and addressed
- Simple



“Full Cost Pricing”

- Operations & maintenance expenditures
- Taxes and accounting costs
- Contingencies for emergencies
- Principal and interest on long-term debt
- Reserves for capital improvement
- Source water protection



Cost-of-Service Pricing

Proportionally allocates costs of service to different customer groups, and prices rates to generate an equitable share of revenues from each customer group.

See AWWA's M1 Manual for details.



Determining Your Financial Needs

- Your current O&M costs
- Your current and future debt service
- Your planned capital projects
- Your rainy day fund in case of budget shortfalls



Determining Financial Need

- Start with your current budgets. How have they changed over time? What is the cost per customer?
- Then include any known future expenses
- Remember inflation, changes in customer levels, etc.



Types of Revenue

- **Rates**
- Period charges
- Assessments
- One-time fees
- Innovative funding sources (services)
- Debt (commercial and subsidized)



Rates & Monthly Charges

- What type of rates and monthly charges do you levy?
 - Charges based on metered usage?
 - Flat monthly charges?
 - Something else?
 - Nothing? Included in rent?



Town of Jacksonville

We charge a flat rate of \$15.00 monthly

P.O. - Box 133
Jacksonville

We ARE A Small town we do NOT have Sewage



Typical Rate Structure

Fixed Base Charge (Minimum Charge)

with or without a consumption allowance

+

Variable Volumetric Charge (determined
by the water volume billed)

Can be structured in many ways

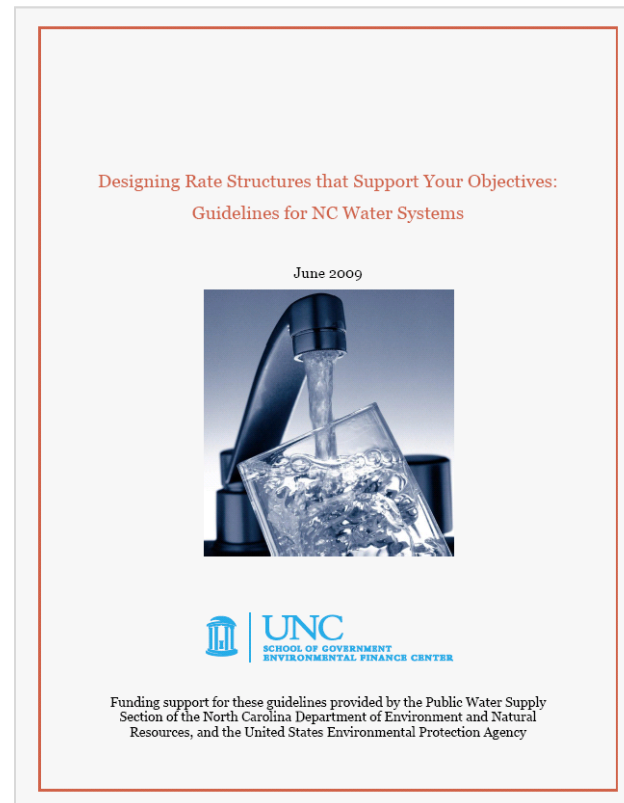


Designing Rate Structures That Support Your Objectives

Free guide
written for
system
managers

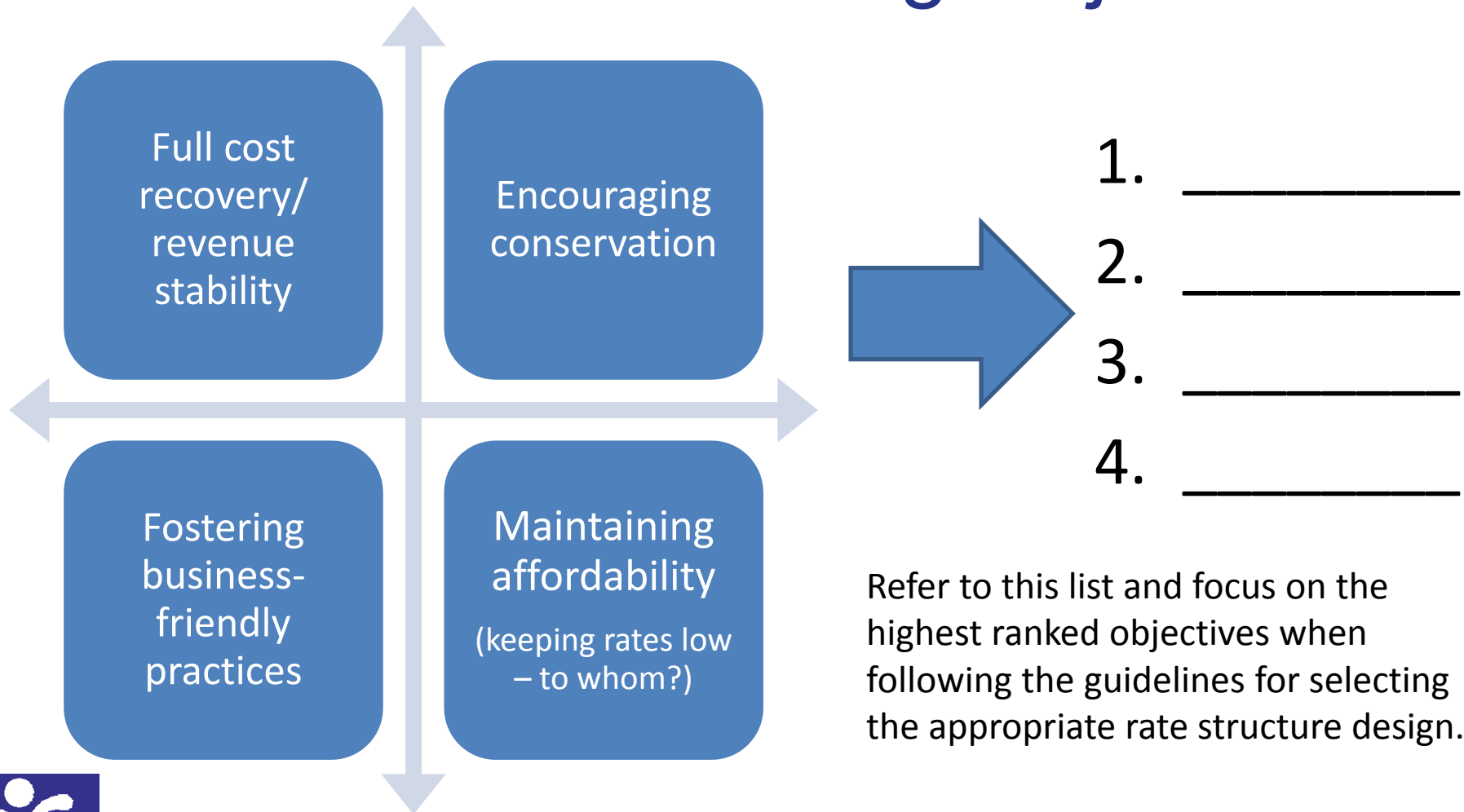
<http://www.efc.sog.unc.edu>

Search for “Designing Rate Structures Guidelines”





Rank Your Rate Setting Objectives






Refer to this list and focus on the highest ranked objectives when following the guidelines for selecting the appropriate rate structure design.



Group Exercise

What are your rate setting objectives?

With others from your system, fill out page 1 of the exercise sheet

Rate Setting Objectives Exercise   

Step 1. What are your system's rate setting objectives?

Full cost recovery/ revenue stability	Encouraging conservation
Fostering business-friendly practices	Maintaining affordability (keeping rates low – to whom?)

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____



Elements of Rate Structure Designs

1. Customer classes/distinction
2. Billing period
3. Base charge
4. Consumption allowance included with base charge
5. Volumetric rate structure
6. (If applicable) Number of blocks, block sizes and rate differentials
7. (Optional) Drought Rates
8. Frequency of rate changes



Customer Classes/Distinction

Alternative	Targets
One rate structure for all	All are equal
Separate rate structure for residential, irrigation, commercial, industrial, governmental, or wholesale customers	Specific type of customer
One rate structure, but with different base charges based on meter size	Non-residential or multi-family housing
One rate structure for all, but with blocks that implicitly only target non-residential use	Non-residential
Negotiated rate structure with individual high-use customers (typically an industrial customer)	Only one customer
Different rates for customers outside municipal limits/service area boundaries	“Outside” customers



Customer Classes/Distinctions

- One rate structure for all

Target: All are equal



Customer Classes/Distinctions

- Different rates for customers outside municipal limits/service area boundaries

Target: “Outside” customers



#2 Mount Pleasant

Water Meter Size	0 to 2,000 Gallons	Gallons Over 2,000
Inside Town		
5/8" or 3/4"	\$21.00	\$3.40/1000
1"	\$39.80	\$3.40/1000
1 1/2 "	\$112.40	\$3.40/1000
2" and up	\$218.00	\$3.40/1000
Outside Town		
5/8" or 3/4"	\$36.75	\$5.95/1000
1"	\$69.65	\$5.95/1000
1 1/2"	\$196.70	\$5.95/1000
2" and up	\$381.50	\$5.95/ 1000



Customer Classes/Distinctions

- Separate rate structure for residential, irrigation, commercial, industrial, governmental, or wholesale customers

Target: Specific type of customers



#3 City of Stockbridge

Gallons of Water Metered

Residential

0 through 4,000 gallons	\$ 4.56 Per Thousand	\$ 4.56 Per Thousand
4,001 through 9,000 gallons	\$ 6.99 Per Thousand	\$ 6.99 Per Thousand
9,001 gallons and up	\$ 9.42 Per Thousand	\$ 9.42 Per Thousand

Commercial, Apartments and Mobile Home Parks

0 through 10,000	\$ 5.78 Per Thousand	\$ 5.78 Per Thousand
10,000 and up	\$ 6.95 Per Thousand	\$ 6.95 Per Thousand

Irrigation

Per thousand gallons	\$ 9.26
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Hydrant Meter

Per thousand gallons	\$ 9.26
----------------------	---------



Customer Classes/Distinctions

- One rate structure, but with different base charges based on meter size

Target: Non-residential or multi-family housing



#2 Mount Pleasant

Water Meter Size	0 to 2,000 Gallons	Gallons Over 2,000
Inside Town		
5/8" or 3/4"	\$21.00	\$3.40/1000
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2" and up	\$381.50	\$5.95/ 1000



#3 City of Stockbridge

Monthly Minimum Base Charge*

<u>Meter Size</u>		<u>Water</u>	<u>Sewer</u>
3/4	Most Residential	\$ 6.00	\$ 6.00
1		\$ 7.00	\$ 7.00
1.5		\$ 37.00	\$ 12.00
2		\$ 100.00	\$ 12.00
3		\$ 175.00	\$ 12.00
4		\$ 225.00	\$ 12.00
6		\$ 300.00	\$ 12.00
8		\$ 400.00	\$ 12.00
10		\$ 700.00	\$ 12.00



Customer Classes/Distinctions

- One rate structure for all, but with blocks that implicitly only target non-residential use

Target: Non-residential



#4 Union Point

INTOWN - 1/23/2006		
STEP	RATE	CONSUMPTION
READY TO SERVE	\$21.00	
STEP 1	3.98	300,000
STEP 2	3.84	999,999,999



Customer Classes/Distinctions


- Negotiated rate structure with individual high-use customers (typically an industrial customer)




Target: Only one customer

Use with caution



Mark your Customer Classes on page 2 of your exercise sheet



Rate Setting Objectives Exercise   

Step 1. What are your system's rate setting objectives?

Full cost recovery/ revenue stability	Encouraging conservation
Fostering business-friendly practices	Maintaining affordability (keeping rates low – to whom?)

1. _____

2. _____

3. _____

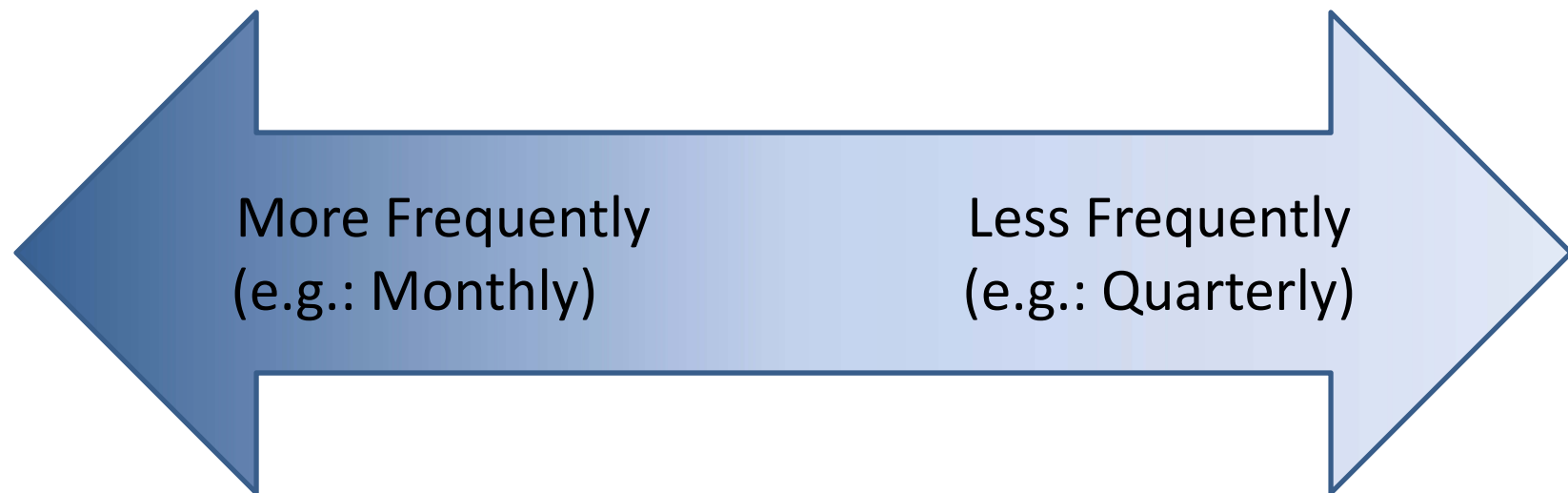
4. _____

5. _____

6. _____




Billing Period






Suggestion: Use a monthly billing period if you can afford it



Mark your Billing Period on page 2 of your exercise sheet



Rate Setting Objectives Exercise   

Step 1. What are your system's rate setting objectives?

Full cost recovery/ revenue stability	Encouraging conservation
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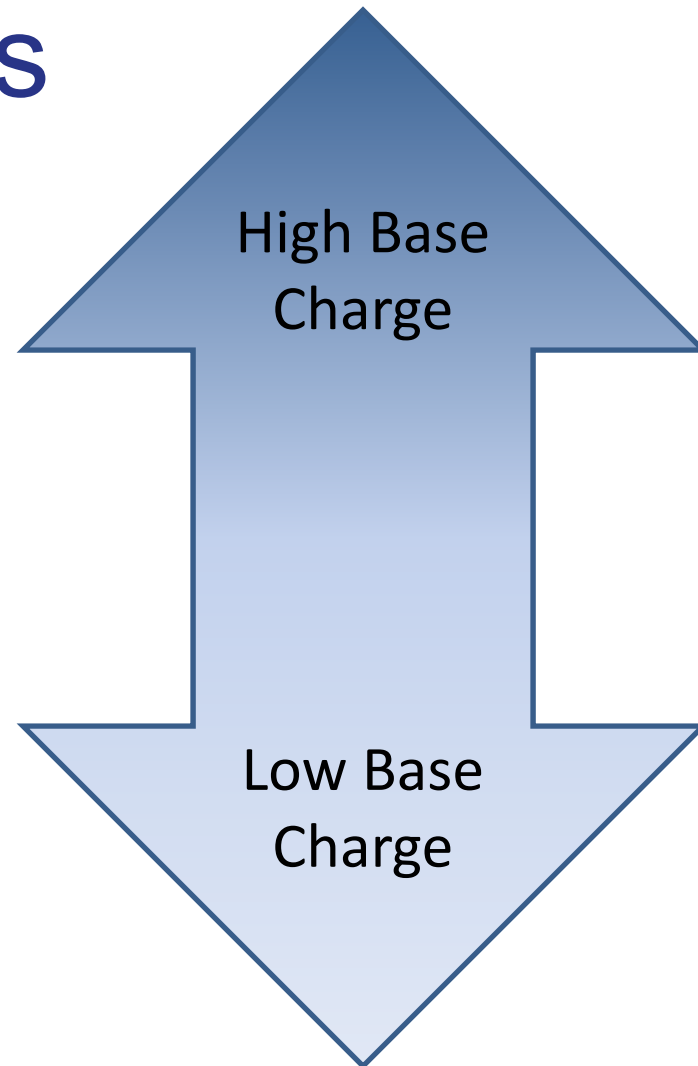
5. _____

6. _____






Base Charges

*Suggestion:
Smaller utilities
should lean
towards higher
base charges*





Mark your Base Charge on page 2 of your exercise sheet

Rate Setting Objectives Exercise   

Step 1. What are your system's rate setting objectives?

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6. _____



Consumption Allowance with Base Charge

Do not
include any
(0 gallons)


Include some
amount
(e.g. 1,000 gal/mo)



Include high
amount
(e.g. 3,000 gal/mo)

Suggestion: For systems with low base charges, do not include any consumption allowance. For systems with high base charges but wish to encourage conservation, keep consumption allowance low, if any.



Mark your Consumption Included in the Base Charge on page 2 of your exercise sheet



Rate Setting Objectives Exercise  

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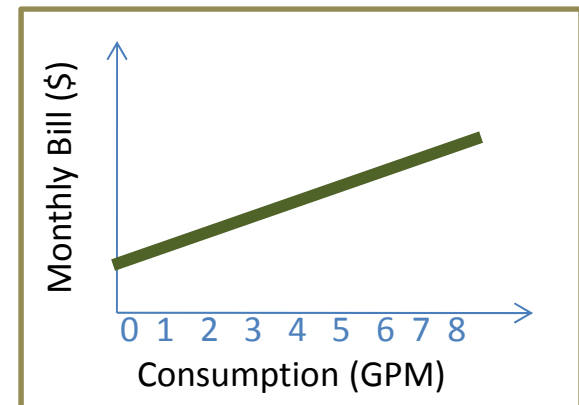
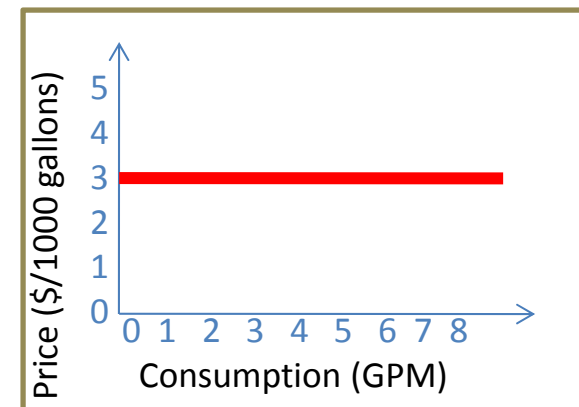
6. _____



Volumetric Rate Structure

Uniform (“Flat”) Rates

- Fair and simple



GPM = gallons/month in these graphs



#2 Mount Pleasant

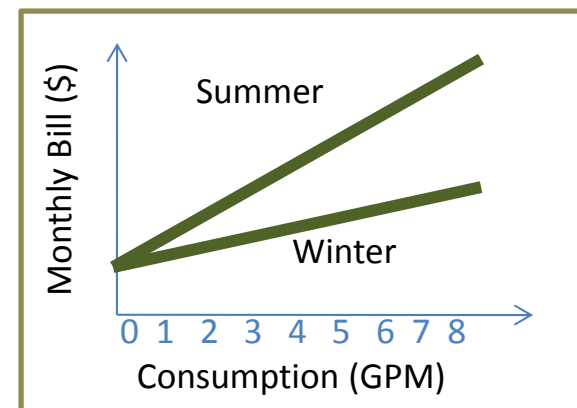
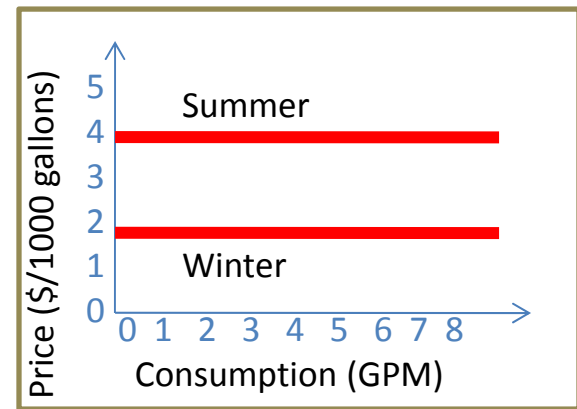
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Volumetric Rate Structure

Seasonal (Uniform) Rates

- Conservation-oriented, good for seasonal communities



GPM = gallons/month in these graphs



#6 Perquimans County

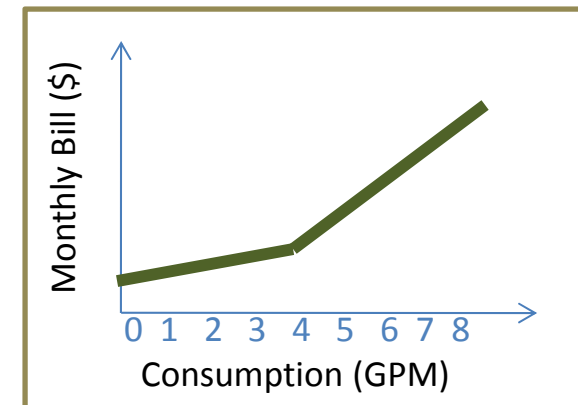
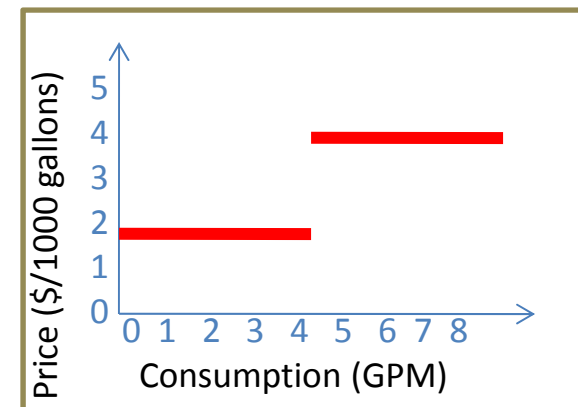
	Reconnection Fee	\$25.00
	Water Meter Test	\$100.00
<u>Seasonal Water Conservation Rates</u>		
\$8/1000 gallons for usage more than 8000 gallons per month from May 1 through October 31		



Volumetric Rate Structure

Increasing Block Rates

- Conservation-oriented
- Lifeline rates for low consumption



GPM = gallons/month in these graphs



#3 City of Stockbridge

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Per thousand gallons	\$ 9.26
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Hydrant Meter

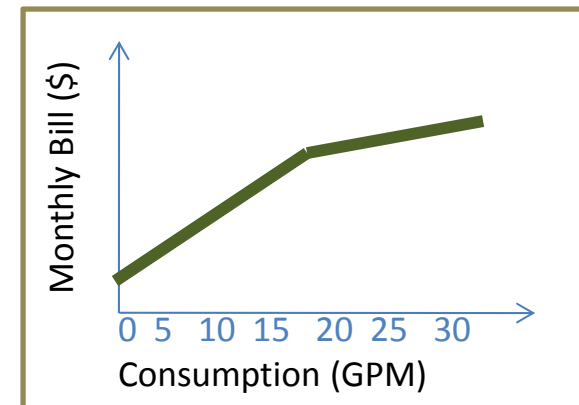
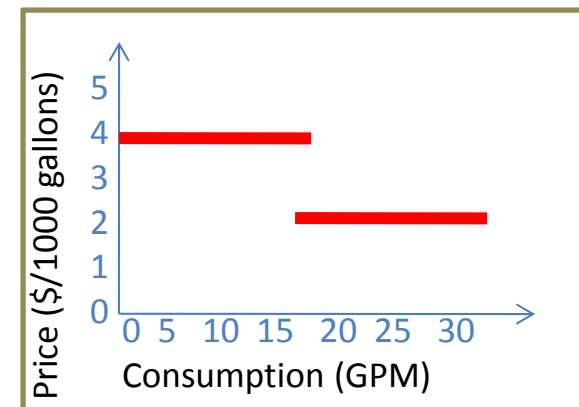
Per thousand gallons	\$ 9.26
----------------------	---------



Volumetric Rate Structure

Decreasing Block Rates

- Provide price break for large users (e.g.: industrial)
- Do not use for residential



GPM = gallons/month in these graphs





#4 Union Point

INTOWN - 1/23/2006

STEP	RATE	CONSUMPTION
READY TO SERVE	\$21.00	
STEP 1	3.98	300,000
STEP 2	3.84	999,999,999



Mark your Rate Structure on page 2 of your exercise sheet

Rate Setting Objectives Exercise  

Step 1. What are your system's rate setting objectives?

Full cost recovery/ revenue stability	Encouraging conservation
Fostering business-friendly practices	Maintaining affordability (keeping rates low – to whom?)

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____



(If Applicable) Block Designs

For block rate structures to be effective:

- Decide on the correct number of blocks
- Decide on where the blocks should end/start
- Set significant rate differentials between blocks



(If Applicable) Block Designs

For block rate structures to be effective:

- Keep in mind your base charge and consumption allowance
- Meter reading must be punctual, and meters must be replaced frequently
- Think about large families





#5 – Too Many Blocks

fixed 1000	Per 1000 gal.	water	Per 1000 gal.	sewer	combined
	rate	11.66	rate	13.10	24.76
2000	2.43	14.09	3.67	16.77	30.86
3000	4.85	18.94	7.41	24.18	43.12
4000	5.65	24.59	7.72	31.90	56.49
5000	5.78	30.37	8.06	39.96	70.33
6000	6.04	36.40	8.21	48.18	84.58
7000	6.23	42.63	8.40	56.58	99.20
8000	6.43	49.06	8.61	65.19	114.24
9000	6.63	55.68	8.79	73.97	129.65
10000	6.63	62.31	8.79	82.76	145.07
11000	6.63	68.93	8.79	91.55	160.48
12000	6.63	75.56	8.79	100.34	175.90
13000	6.63	82.18	8.79	109.13	191.31
14000	6.63	88.81	8.79	117.92	206.72
15000	6.63	95.43	8.79	126.71	222.14
15001-99999999	6.51	102.27	8.99	135.69	237.96



If you have block rates, mark
your Number of Blocks on page
2 of your exercise sheet

Rate Setting Objectives Exercise  

Step 1. What are your system's rate setting objectives?

Full cost recovery/revenue stability	Encouraging conservation
Fostering business-friendly practices	Maintaining affordability (keeping rates low - to whom?)

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____



(Optional) Drought Rates

- Prepare for drought in advance: create an ordinance *in advance* to give the utility the ability to raise rates temporarily during a water shortage scenario (sometimes called “drought surcharges”).





#7 Lake Egypt Water District

3. That the above rates charged for non wholesale water customers shall be increased for any consumption above 2,000 as follows when the water level at the Lake of Egypt spillway, at any time during a billing cycle, falls below the levels specified:
 - a. 24 inches below spillway rates shall increase \$1.00
Per thousand gallons
 - b. 30 inches below spillway rates shall increase \$2.00
Per thousand gallons
 - c. 36 inches below spillway rates shall increase \$3.00
Per thousand gallons
 - d. 40 inches below spillway rates shall increase \$5.00
Per thousand gallons
 - e. 48 inches below spillway rates shall increase \$10.00
Per thousand gallons



Mark whether you have Drought Rates on page 2 of your exercise sheet

Rate Setting Objectives Exercise  

Step 1. What are your system's rate setting objectives?

Full cost recovery/ revenue stability	Encouraging conservation
Fostering business-friendly practices	Maintaining affordability (keeping rates low - to whom?)

1. _____

2. _____

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6. _____



Frequency of Rate Changes

- Always review your rates annually (recommended)
- Review your financial health indicators annually, and then review your rates if any of the indicators reflect poor financing
- If having difficulty analyzing and raising rates, consider an ordinance that automatically raises rates based on inflation in years in between rate studies as a minimum (though NOT ideal)



#8 Village of Richmond


SECTION 3.27 ANNUAL INCREASE OF RATES AND FEES



The following fees: Water and Sewer Service, Building Permit Fees, School Impact Fees, Fire Prevention and Life Safety Donations and Municipal Impact Fees as set forth by Village ordinance are subject to an annual increase to be applied by the Village Treasurer by May 1 of each year using the following prescribed formula:

The above rates and Fees will be increased by the amount of the percentage increase of the Consumer Price Index (hereinafter defined) for the previous calendar year. Consumer Price Index ("CPI") means the U.S. City Averages for all Urban Consumers, All Items, (1982-1984=100) of the United States Bureau of Labor Statistics. The CPI for any calendar year shall be determined by averaging the monthly indices for that year. If the Bureau of Labor Statistics substantially revises the manner in which the CPI is determined, an adjustment shall



Mark your Frequency of Rate Review on page 2 of your exercise sheet



Rate Setting Objectives Exercise  

Step 1. What are your system's rate setting objectives?

Full cost recovery/ revenue stability	Encouraging conservation
Fostering business-friendly practices	Maintaining affordability (keeping rates low – to whom?)

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____



Important: Avoid maintaining low rates at the expense of your utility's financial health. It will either lead to a sudden, massive rate increase in the future or to failing systems and endangering public health.



Scenario: Rural Water Utility With Naturally High Costs and Excess Capacity, Wants to Maintain Affordability

1. Customer class
2. Billing period
3. Base charge
4. Consumption allowance
5. Volumetric rate structure
6. (If applicable) Block design
7. (Optional) Temporal adjustments
8. Frequency of rate changes





Scenario: Rural Water Utility With Naturally High Costs and Excess Capacity, Wants to Maintain Affordability

1. Customer class: possibly create separate residential class.
2. Billing period: use monthly.
3. Base charge: if majority of customers use little water, charge fair base charge and include allowance. Otherwise, low base charge, and shift high rates to high volume users.
4. Consumption allowance: if including, set at a lifeline amount (~2,000 gallons/month).
5. Volumetric rate structure: probably use uniform
6. (If applicable) Block design: if using, first block at least 4,000 gallons/month, depending on your customers' consumption.
7. (Optional) Temporal adjustments: none.
8. Frequency of rate changes: annual.



Look at your rate setting objectives.
Look at your rate structure. Do they line up? What changes do you want to consider?

Rate Setting Objectives Exercise  

Step 1. What are your system's rate setting objectives?

Full cost recovery/ revenue stability	Encouraging conservation
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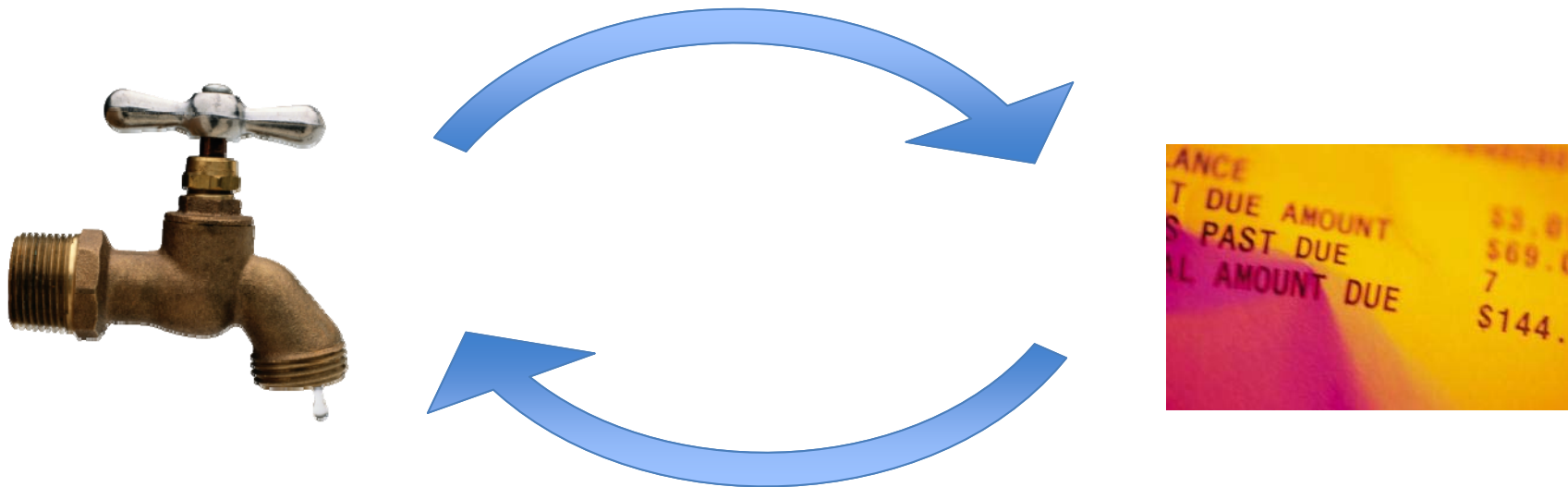


A Quick Aside on Increasing Rates



How Rates and Usage Interact

Set rates based on projected water use



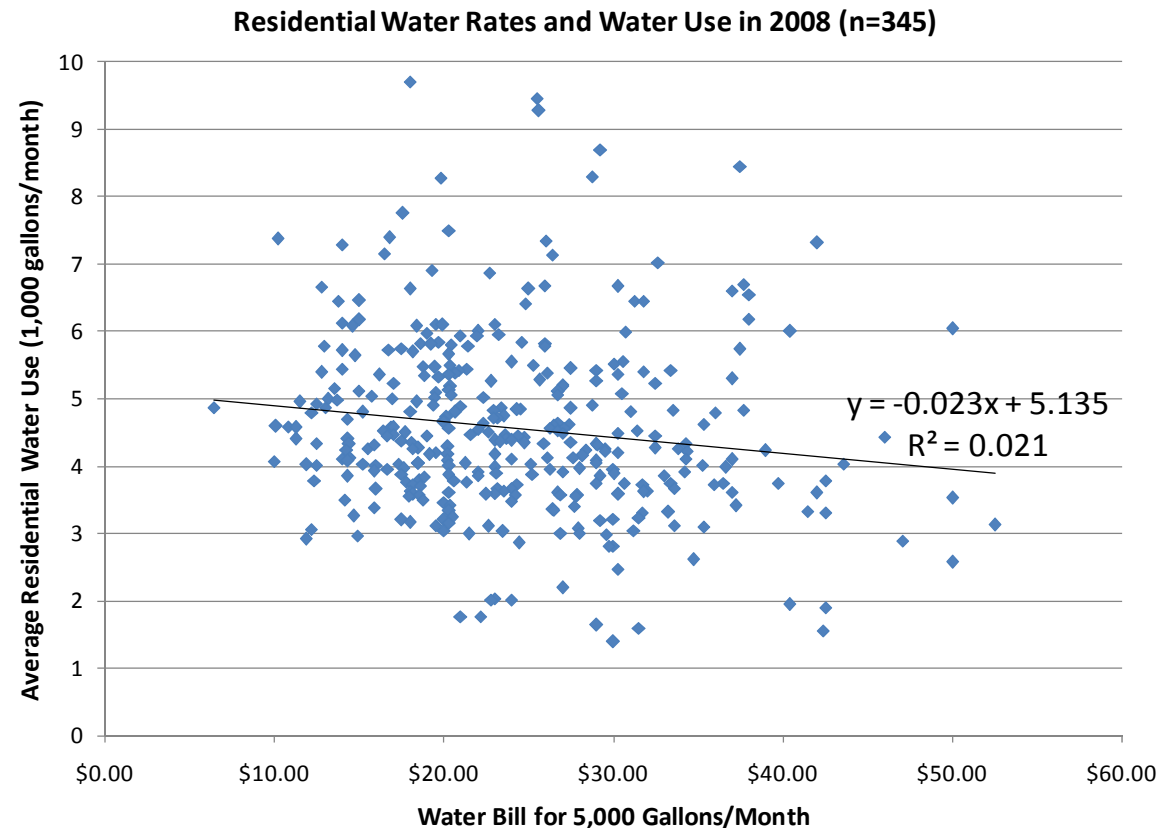
Raising rates lowers water use

Rule of thumb: water use declines ~2-5% as rates increase 10%



How Rates and Usage Interact

Estimates vary by community and season. For example, in NC, we found that, on average, utilities charging 10% higher rates have 3-4% lower residential usage.



Data sources: Usage data from Division of Water Resources (DWR). Rates data from EFC/NCLM Rates Survey.

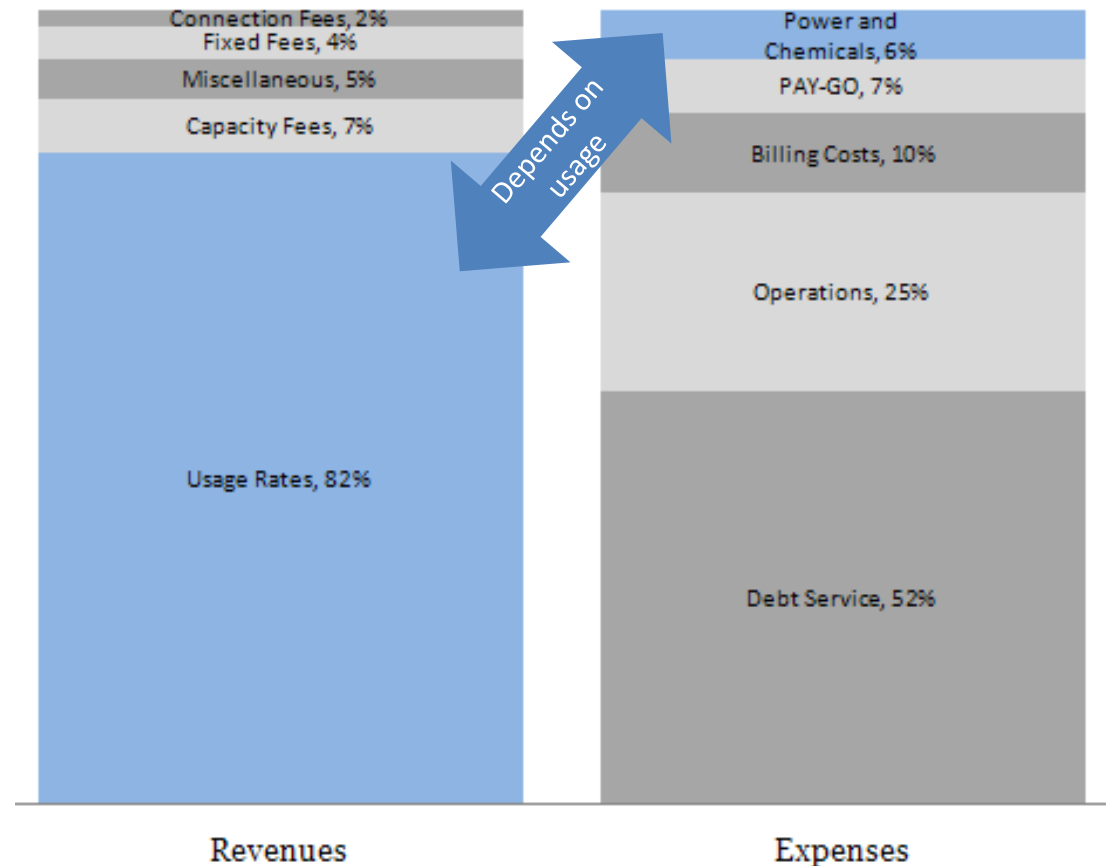




How Rates and Usage Interact

Utilities' costs are mostly fixed, not dependent on the amount of water sold/used by the customers. But the majority of revenues come from the amount of water sold. If customers conserve, revenues drop significantly but not costs.

Revenue and Expenses for Charlotte Water in a Given Year



Source: Charlotte Water Director Doug Bean's presentation to the Charlotte City Council on December 1, 2008.



Guidebooks on Setting Rates/Financial Planning



Setting Small Drinking Water System Rates for a Sustainable Future

One of the Simple Tools for Effective Performance (STEP) Guide Series



<http://www.awwa.org>



<http://www.epa.gov/safewater/smallsystems>

http://www.epa.gov/ogwdw/smallsystems/pdfs/guide_smallsystems_final_ratesetting_guide.pdf



www.efcnetwork.org



UNC
ENVIRONMENTAL FINANCE CENTER




Water & Wastewater Rates Analysis Model

<http://efc.sog.unc.edu/> Find it in Resources / Tools


Free, simplified Excel tool allowing you to model and compare two rate structures on your projected fund balance

Water & Wastewater Rates Analysis Model
Version 2.8.2 (last updated August 4, 2015)



UNC
ENVIRONMENTAL FINANCE CENTER

Developed by the Environmental Finance Center at the University of North Carolina, Chapel Hill
<http://efc.sog.unc.edu>



NCDENR
NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

Funded by the U.S. Environmental Protection Agency and the Public Water Supply Section of the North Carolina Department of Environment and Natural Resources

DESCRIPTION
A do-it-yourself, simplified financial model to assist utility managers and private system owners in setting water and wastewater rates.

FEATURES

- Comparisons of annual fund balance projections (for up to 20 years) under proposed new rates vs. staying with existing rates
- Adjust rates for the next 1-5 years
- Up to 12 rate structures
- Uniform or block rates (up to 10 blocks)
- Model changes to accounts and water use
- Customizable list of operating and capital expenses
- Building up reserves through rates
- Compare monthly bills under new rates vs. existing rates
- Assess revenue sufficiency and fund balance
- Error notifications

INSTRUCTIONS

1) Navigate using worksheet tabs at bottom of screen or following arrows and clicking on buttons

2) In the green "Data Input" worksheets, input data in the dark green cells

View Results

Financial forecast of the next few years under 'Existing' rates versus 'New' rates (graphs of cost recovery and end-of-year fund balance)

How new rates compare to existing rates (graphs of monthly bills)

Year	2015	2016	2017	2018	2019	2020
Revenue	\$115.50	\$13.00	\$4.00	\$17.00	\$20.00	\$21.00
Expenses	2,000	2,000	2,000	2,000	2,000	2,000

charge (gallons/monthly)

Block End	2015	2016	2017	2018	2019	2020
1,000	\$2.75	\$2.75	\$2.75	\$3.00	\$3.50	\$4.00
2,000	\$4.00	\$4.50	\$5.00	\$5.50	\$6.00	\$6.50
3,000	\$5.00	\$5.50	\$6.00	\$6.50	\$7.00	\$7.50

Watch out for red "Error" messages describing where data entry errors



EFC Resources for Water Systems to Help with Rate Setting

- Guidebooks on designing appropriate rate structures based on utility objectives
- Do-it-yourself tools in Excel to allow you to analyze your rates and try out scenarios
- Benchmarking rates and financial performance (Rates Dashboard)
- Documents that provide information and data on NC rates, tap & impact fees, financial practices, etc.
- Capital planning reference guide
- Trainings and workshops
- Direct assistance
- Weekly blog posts on related financial and managerial issues
- And more...

Most funded by NCDEQ
Public Water Supply Section
or US EPA, so they are **free** for you

<http://efc.sog.unc.edu>



www.efcnetwork.org

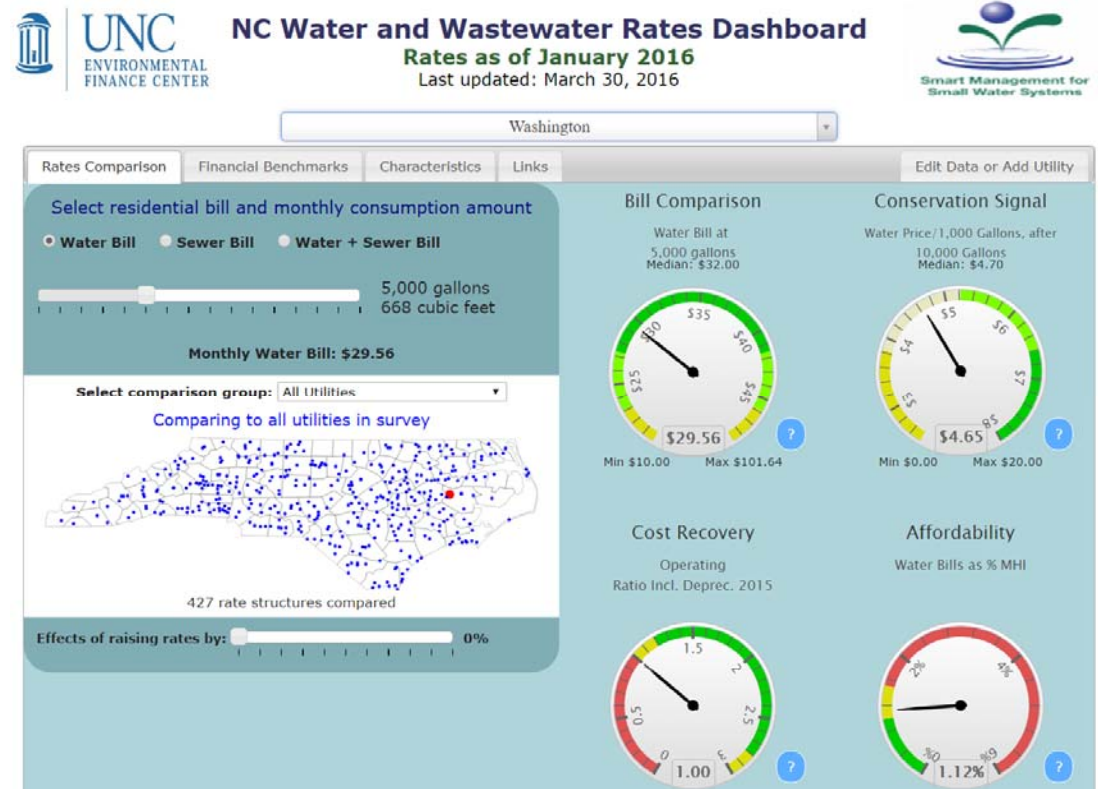


UNC
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The NC Rates Dashboard

Go to: efc.sog.unc.edu and search for “North Carolina Rates Dashboard”



<http://www.efc.sog.unc.edu/reslib/item/north-carolina-water-and-wastewater-rates-dashboard>

www.efcnetwork.org



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For More Information

Shadi Eskaf

Senior Project Director

Environmental Finance Center

School of Government, University of North Carolina

919-962-2785

eskaf@sog.unc.edu



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