



Smart Management for  
Small Water Systems

# Financial Tools for Small Drinking Water Systems

Stacey Isaac Berahzer  
Dover, DE  
May 3, 2016



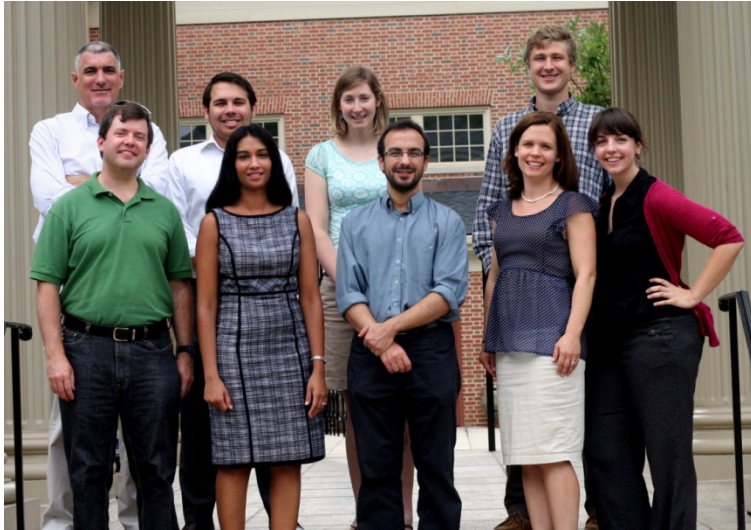
UNC  
ENVIRONMENTAL  
FINANCE CENTER

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



# UNC

## ENVIRONMENTAL FINANCE CENTER



UNC SCHOOL of GOVERNMENT

*Dedicated to enhancing the ability of governments and other organizations to provide environmental programs and services in fair, effective, and financially sustainable ways through:*

- Applied Research
- Teaching and Outreach
- Program Design and Evaluation



*How you pay for it matters*



UNC  
ENVIRONMENTAL FINANCE CENTER

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

@EFCatUNC



## About the Environmental Finance Center Network (EFCN)

The Environmental Finance Center Network (EFCN) is a university-based organization creating innovative solutions to the difficult how-to-pay issues of environmental protection and improvement. The EFCN works with the public and private sectors to promote sustainable environmental solutions while bolstering efforts to manage costs.

## The Smart Management for Small Water Systems Program

This program is offered free of charge to all who are interested. The Project Team will conduct activities in every state, territory, and the Navajo Nation. All small drinking water systems are eligible to receive free training and technical assistance.

## What We Offer

Individualized technical assistance, workshops, small group support, webinars, eLearning, online tools & resources, blogs





## The EFCN Project Team

- Environmental Finance Center at The University of North Carolina at Chapel Hill
- EFC West
- Environmental Finance Center at Wichita State University
- New England Environmental Finance Center at University of Southern Maine
- Southwest Environmental Finance Center
- Syracuse University Environmental Finance Center







## Areas of Expertise

- Asset Management
- Energy Management Planning
- Financial Management
- Leadership Through Decision-making and Communication
- Managing Drought
- Water Loss Reduction
- Collaborating with Neighboring Communities
- Multi-funding
- Water Conservation
- Management and Finance 101
- Climate Resiliency
- Workforce Development

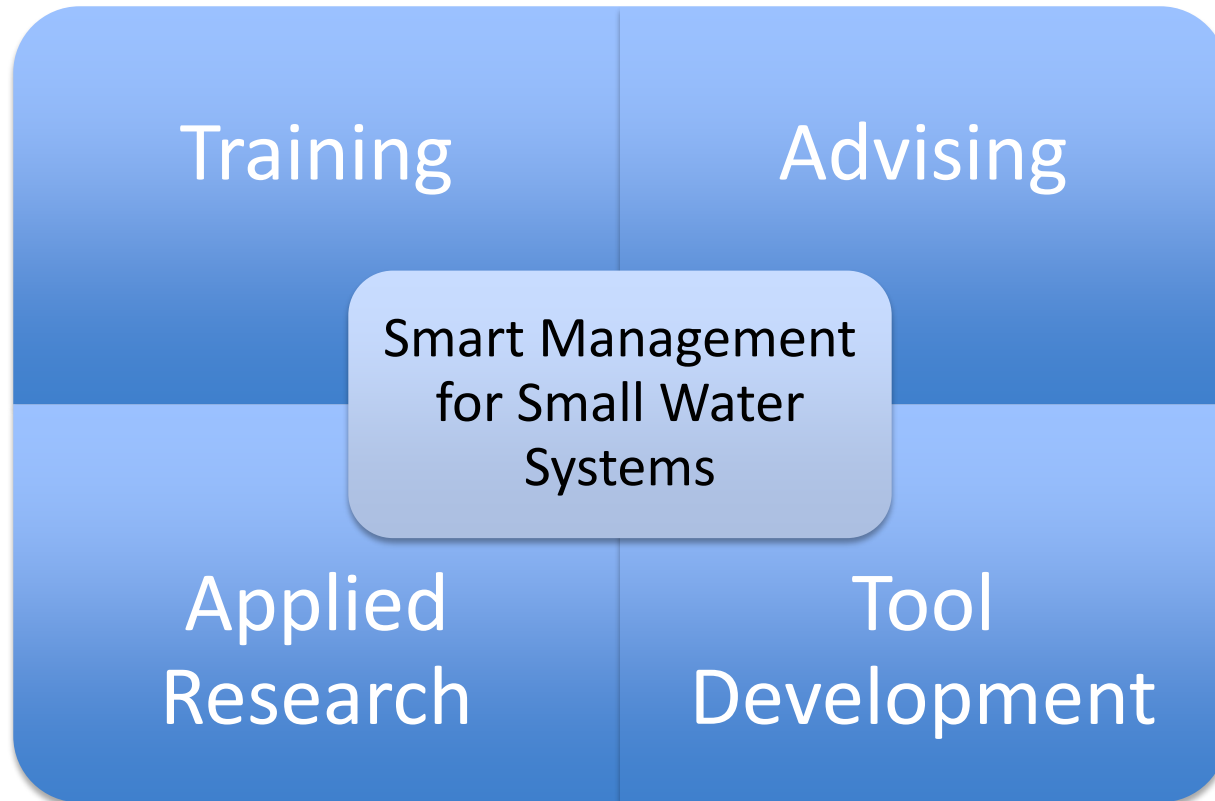


# Session Objectives

- Understand your system's current financial condition
- Learn how to plan for and finance your water system now and into the future



# What we offer



Individualized technical assistance, workshops, small group support, webinars, eLearning, online tools & resources, blogs



# Our tools are designed to meet your challenges:





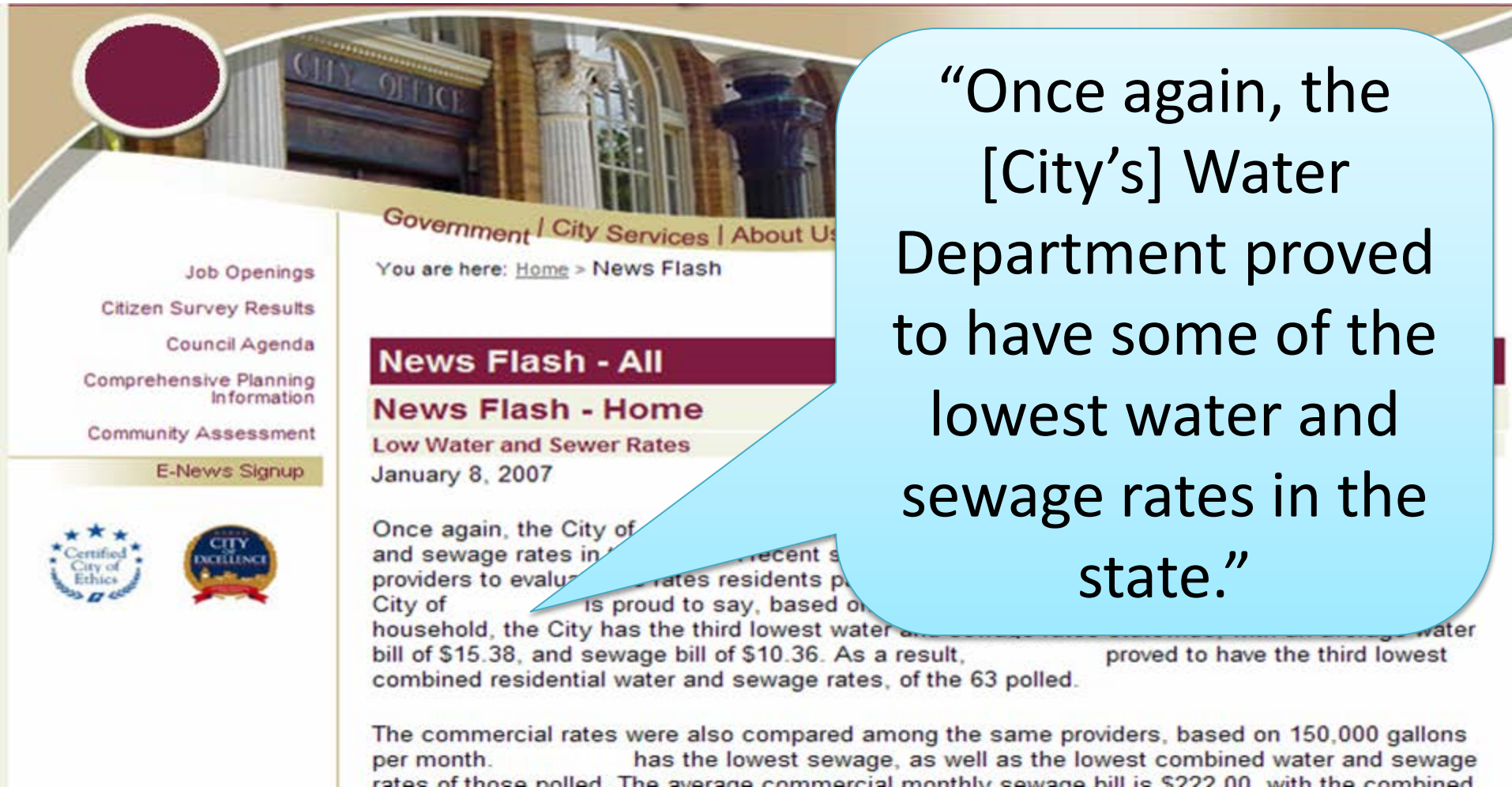


# Rate Setting - How much money do you need?



# Systems Love Low Rates, but...

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



The screenshot shows a city website with a navigation menu on the left and a news flash article on the right. The navigation menu includes links for Job Openings, Citizen Survey Results, Council Agenda, Comprehensive Planning Information, Community Assessment, and E-News Signup. The news flash article is titled 'News Flash - All' and 'News Flash - Home', with the headline 'Low Water and Sewer Rates' dated January 8, 2007. The article text states: '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] water 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 [redacted]'



Will it provide sufficient  
cost recovery?

Are we  
following the  
applicable  
laws?

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?







Learn essential background information about rates

Determine critical characteristics of your utility and community

Design the most appropriate rate structure

*Cost-of-Service Study*  
Compute the rates using projected costs and revenues

Re-evaluate/adjust rate structure to fit primary objectives

# The Process of Setting Rates





# Basic Principles

- Aim at full cost pricing
- Set equitable rates
- Share rate structure with customers
- Rate should be easy to understand
- Rates should be examined annually
- Consider fixed costs vs. variable costs
- Allow for reserve account(s)
- *Promote water conservation?*
- *Promote economic development?*



# “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



# Grants Aren't Completely Free Money

- Application for the grant can be expensive – staff time and money
- Applications can take months to process
- Often lots of strings attached
- Often require a percentage match
- Lots of competition
- Difficult to sustain



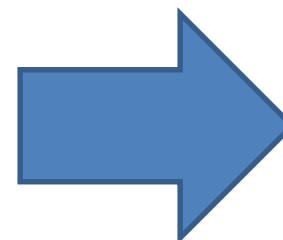
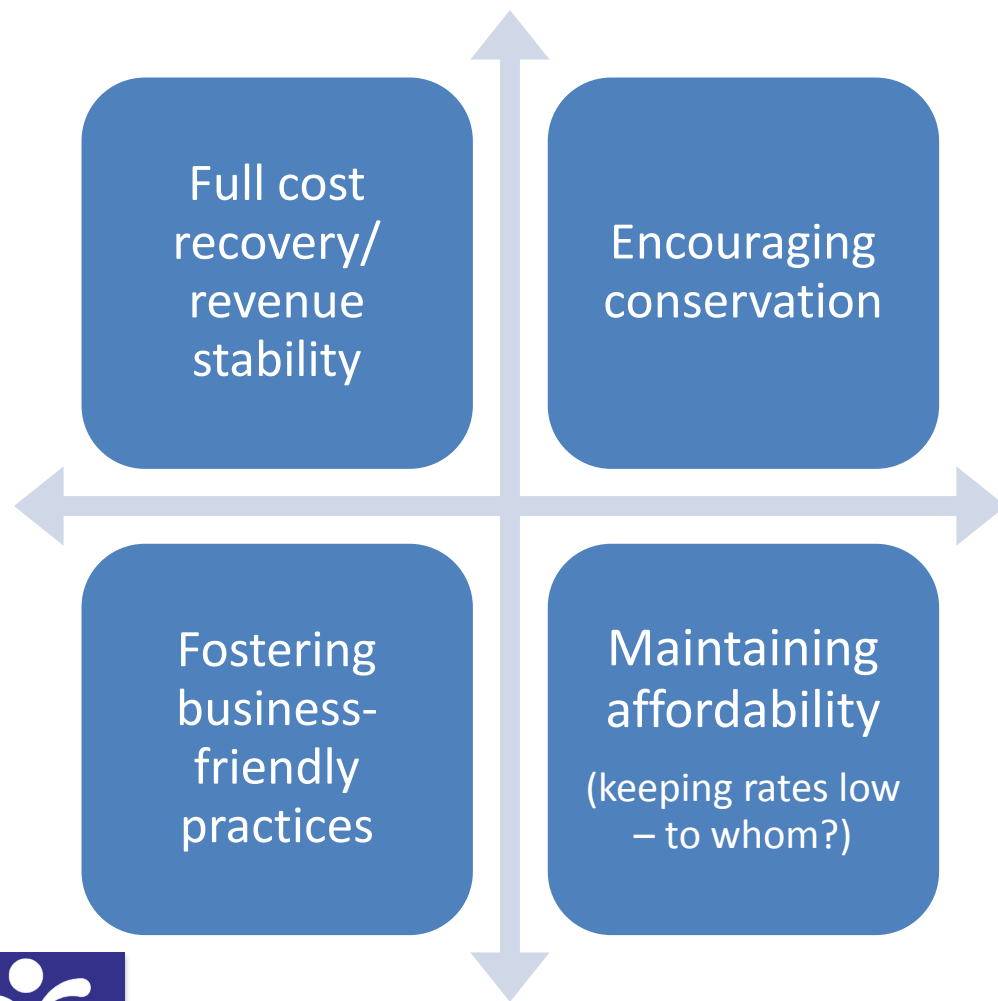
# Rates & Monthly Charges

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





# Rank Your Rate Setting Objectives



1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

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



# What are your rate setting objectives?



# 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

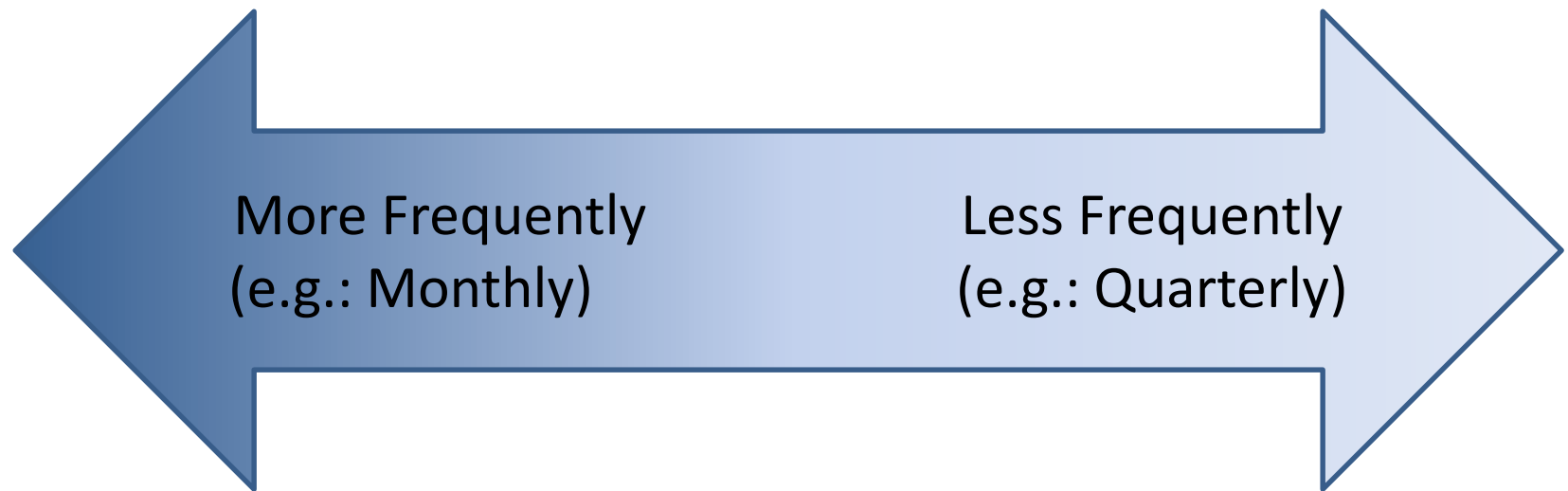


# Mark your Customer Classes on your sheet





# Billing Period



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

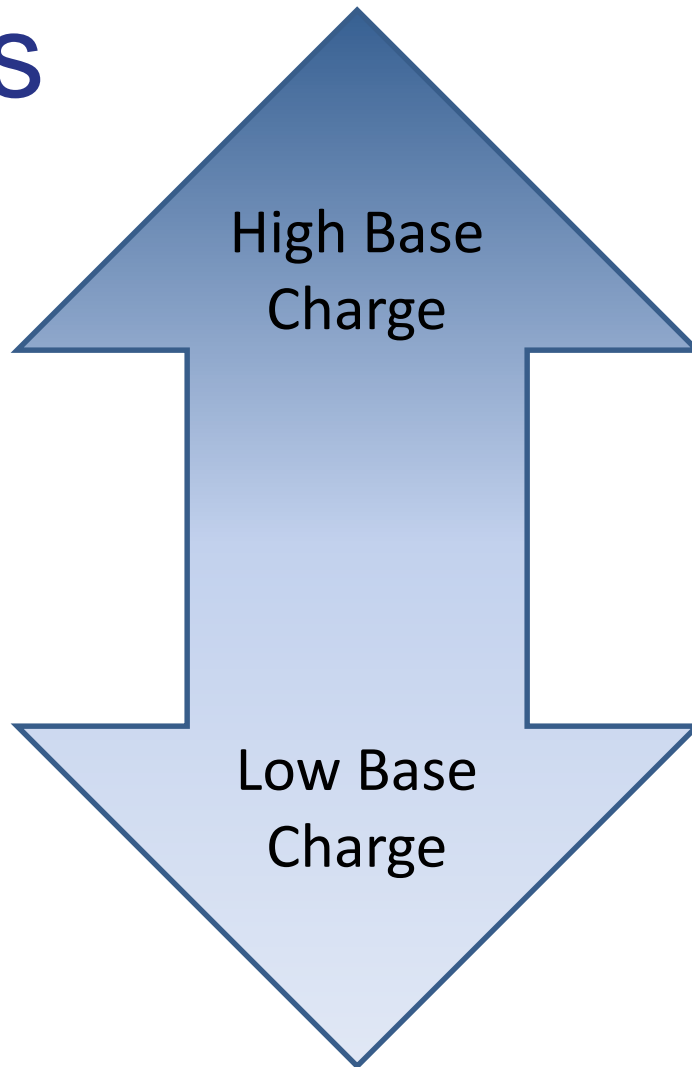


# Mark your Billing Period on your sheet



# Base Charges

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





# Mark your Base Charge on your sheet





# 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.*



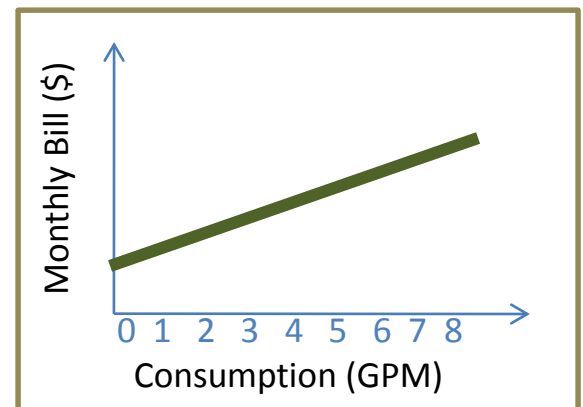
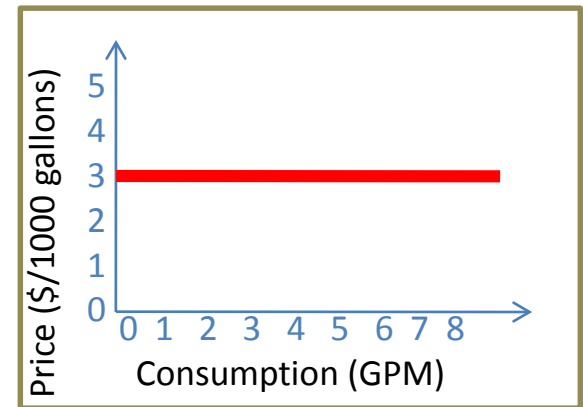
# Mark your Consumption Included in the Base Charge on your sheet



# Volumetric Rate Structure

## Uniform (“Flat”) Rates

- Fair and simple

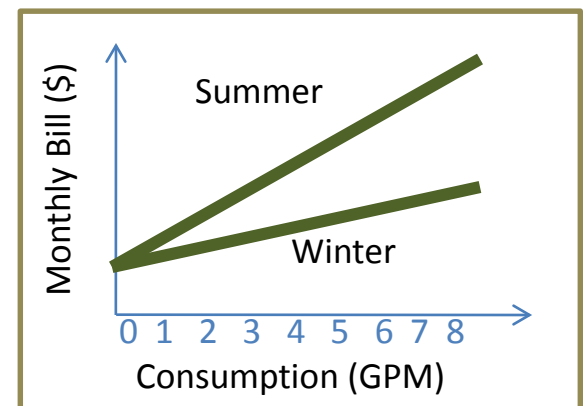
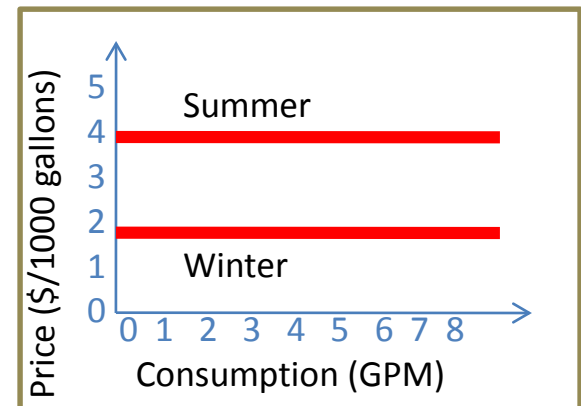




# Volumetric Rate Structure

## Seasonal (Uniform) Rates

- Conservation-oriented, good for seasonal communities

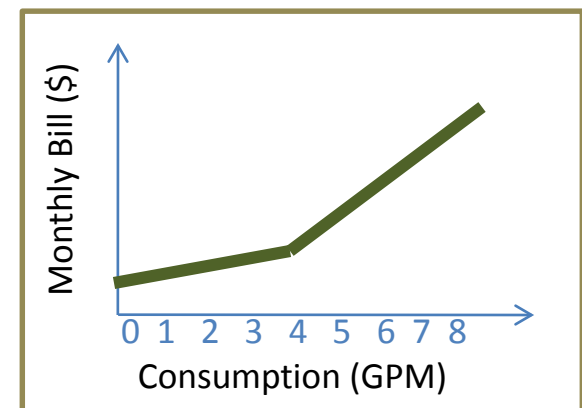
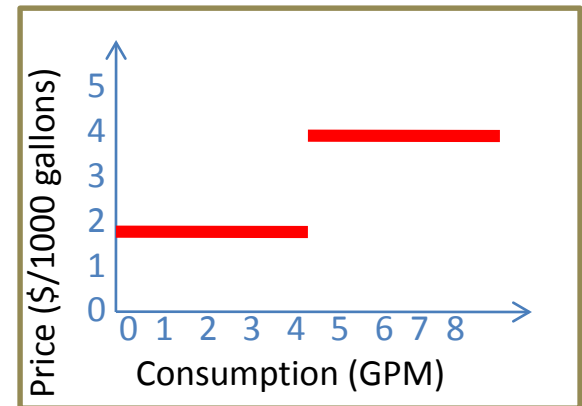




# Volumetric Rate Structure

## Increasing Block Rates

- Conservation-oriented
- Consider large families



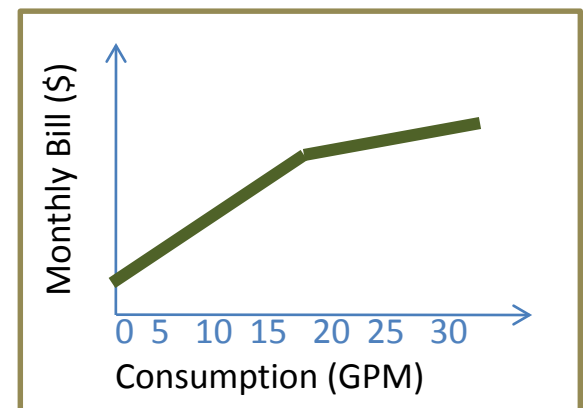
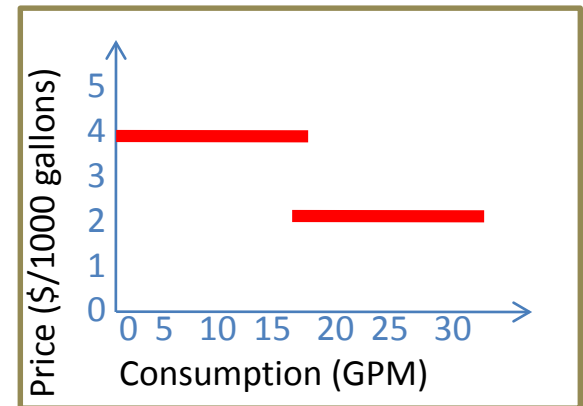




# Volumetric Rate Structure

## Decreasing Block Rates

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





# Mark your Rate Structure on your sheet



# (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



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





# (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”).

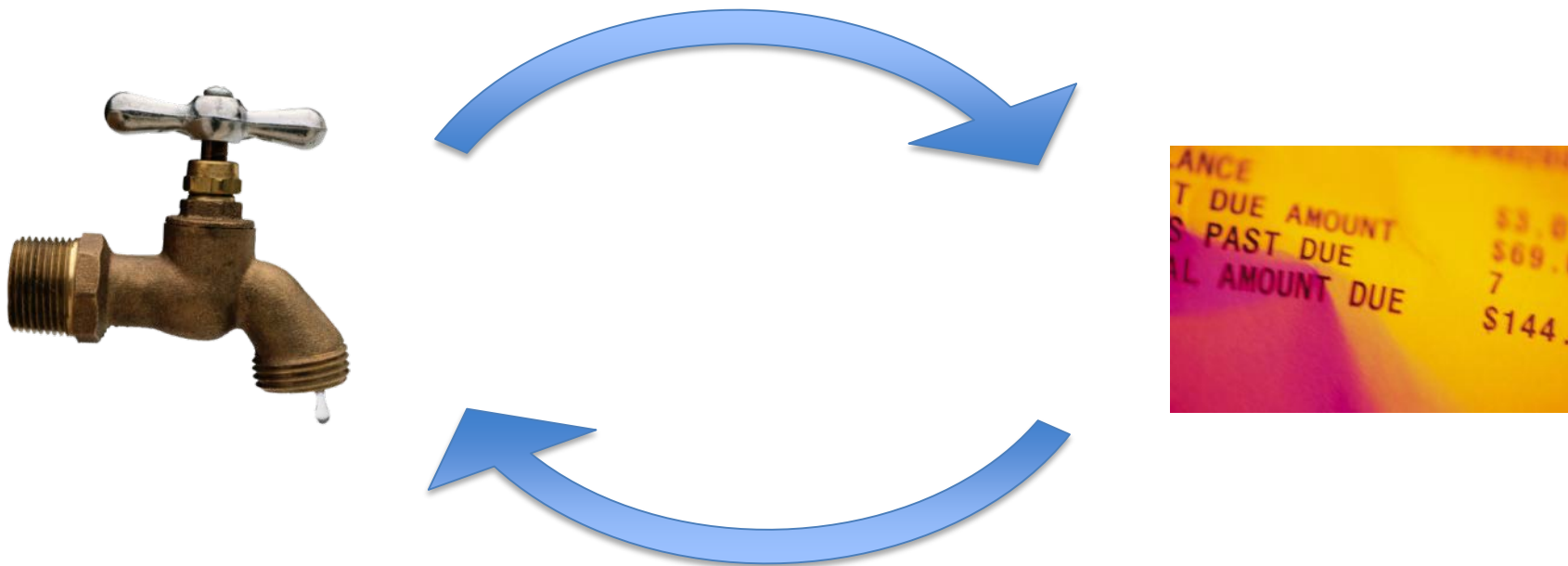


# Mark whether you have Drought Rates on your sheet



# How Rates and Usage Interact

Set rates based on projected water use



Raising rates lowers water use

Rule of thumb: water use declines ~2-6% as rates increase 10%



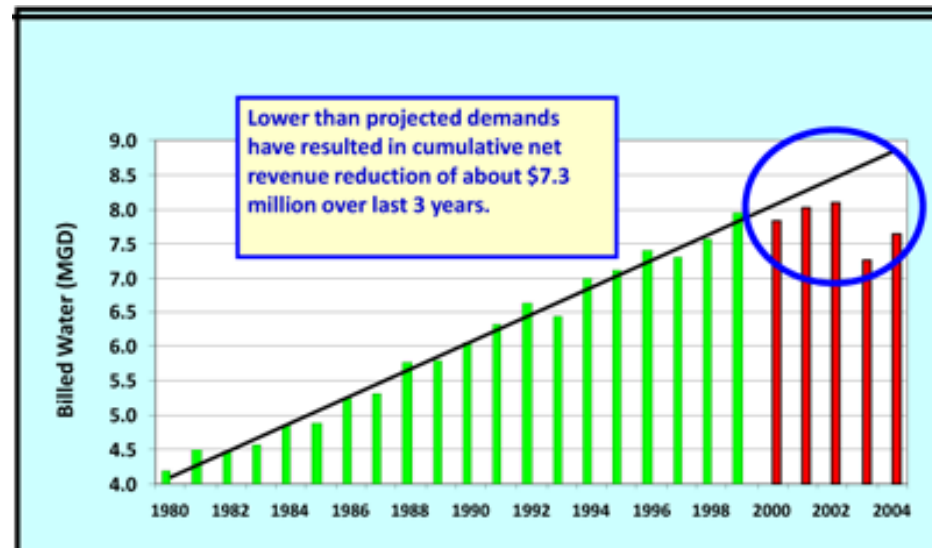
# Background Information:

## How Rates and Usage Interact

Public Perception:



Utility Reality:



Source: Fayetteville Observer 2/6/2004

Source: Orange Water & Sewer Authority

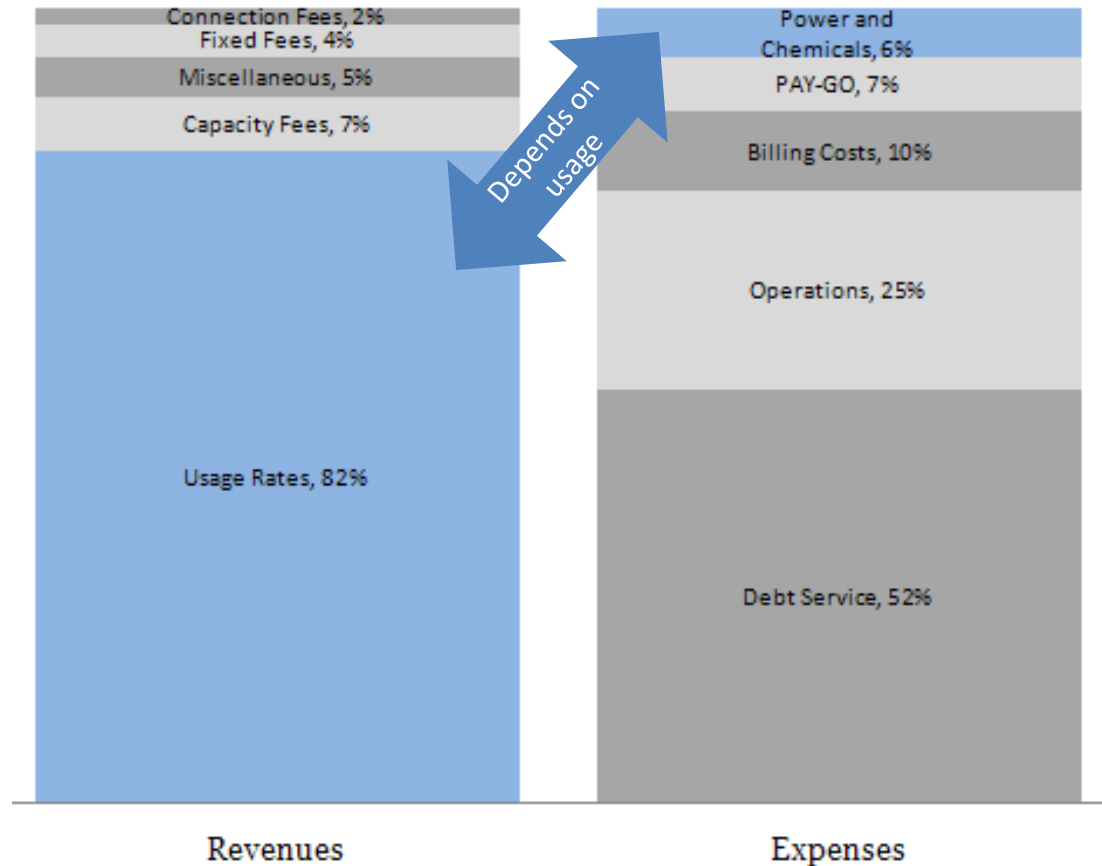




# Why Does this Happen?

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-Mecklenburg Utilities in a Given Year



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





# 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
- Perhaps less politically charged option: Raise rates each year automatically based on inflation



# Mark your Frequency of Rate Review on your sheet



# Frequency of Rate Changes

- *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.*



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





## **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 GPM, depending on your customers' consumption.
7. (Optional) Temporal adjustments: none.
8. Frequency of rate changes: annual.

Note: Set up a customer assistance program: <http://efc.sog.unc.edu/reslib/item/customer-assistance-program-costing-tool-north-carolina>.



# Water and Sewer Rates Analysis Model

# Free, rate-setting tool using only MS Excel, developed by the Environmental Finance Center at UNC.

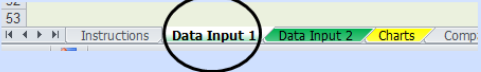


## Water and Sewer Rates Analysis Model

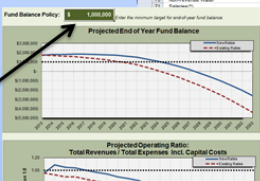
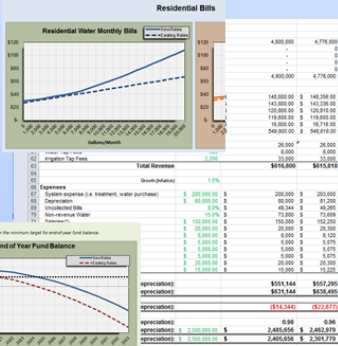
Version 2.7 (updated March 24, 2014)

20-year fund balance estimates under proposed new rates vs. existing rates; compare side-by-side  
Uniform or block rates      Residential and non-residential rates      Changes to customers and demands

### INSTRUCTIONS

- 1) Click on tabs at bottom of screen to navigate to different pages.  

- 2) On the **"Data Input 1"** tab enter current and new rate details in the dark green cells.  

Rate Structure		2012	
Residential Rates	Existing	Block Start	Block End
Water Base Rate	\$10.00		
Block Rate 1 (\$/1,000 gal)	\$1.00	2,001	5,000
Block Rate 2 (\$/1,000 gal)	\$2.00	5,001	7,000
Block Rate 3 (\$/1,000 gal)	\$3.00	7,001	12,001
Block Rate 4 (\$/1,000 gal)	\$4.00		
Final Block Rate (\$/1,000 gal)	\$5.00		
- 3) On the **"Data Input 2"** tab enter current consumption levels, utility finances, and other assumptions in the dark green cells.  

Starting Fund Balance		FY2013	
Existing	12,235,000 (gal/month)	Fund Balance at the Beginning of FY2013	\$ 1,750,000
	5,500 (gal/month)		
- 4) On the **"Charts"** tab, see projections of the End of Year Fund Balance, and input a Fund Balance Policy in the dark green cell at the top of the page.  

- 5) Compare new rates to existing rates in **"Compare Monthly Bills"** and their impacts on costs and revenues in **"Existing Rates"** or **"New Rates"**.  


*Note: This tool models the impact on a utility's fund balance of a one-time increase in rates, rather than an ongoing series of rate increases. Update this tool every year and do not rely on analysis conducted more than one year ago.*

Copyright © 2014 Environmental Finance Center at the University of North Carolina, Chapel Hill. [efc.sog.unc.edu](http://efc.sog.unc.edu)  
 Funded by the Public Water Supply Section, Division of Water Resources at the NC Department of Environment and Natural Resources, and the U.S. Environmental Protection Agency  
[Download the latest version of this tool at http://efc.sog.unc.edu](http://efc.sog.unc.edu). Find it in Resources / Tools.  
 Provide feedback or ask questions by emailing Shadi Eskaf at [eskaf@sog.unc.edu](mailto:eskaf@sog.unc.edu)

Download the latest version at  
<http://efc.sog.unc.edu>.  
 Find it in Resources / Tools.

Tool development was funded by the  
 Public Water Supply Section  
 of DWR/ NCDENR  
 and partly by the USEPA.





<http://efc.sog.unc.edu/reslib/item/water-sewer-rates-analysis-model>

## Data Input 1

Rate\_Analysis-version2 - Microsoft Excel

File Home Insert Page Layout Formulas Data Review View

Clipboard Font Alignment Number Styles Cells Editing

Q3 100

**Water and Sewer Rates Analysis Model. Version 2.0**

**Inputs: Rates and Rate Structures**

Input current rate and account information in the dark green cells to analyze projected cashflows from rate changes.

**Rate Structure**

**Residential Rates**

Water:

	FY:	2012	2013
		Existing	New
Water Base Rate		\$10.00	\$12.00
Block Rate 1 (\$/1,000 gal)		\$1.00	\$1.25
Block Rate 2 (\$/1,000 gal)		\$2.00	\$2.25
Block Rate 3 (\$/1,000 gal)		\$3.00	\$3.25
Block Rate 4 (\$/1,000 gal)		\$4.00	\$4.25
Final Block Rate (\$/1,000 gal)		\$5.00	\$5.25

Sewer:

	2012	2013
	Existing	New
Sewer Base Rate	\$10.00	\$12.00
Block Rate 1 (\$/1,000 gal)	\$1.00	\$1.25
Block Rate 2 (\$/1,000 gal)	\$2.00	\$2.25
Block Rate 3 (\$/1,000 gal)	\$3.00	\$3.25
Block Rate 4 (\$/1,000 gal)	\$4.00	\$4.25
Final Block Rate (\$/1,000 gal)	\$5.00	\$5.25

**Rate Structure**

**Commercial Rates**

Water:

	2012	2013
	Existing	New
Water Base Rate	\$10.00	\$12.00
Block Rate 1 (\$/1,000 gal)	\$1.00	\$1.25
Block Rate 2 (\$/1,000 gal)	\$2.00	\$2.25
Block Rate 3 (\$/1,000 gal)	\$3.00	\$3.25
Block Rate 4 (\$/1,000 gal)	\$4.00	\$4.25
Final Block Rate (\$/1,000 gal)	\$5.00	\$5.25

Sewer:

	2012	2013
	Existing	New
Sewer Base Rate	\$10.00	\$12.00
Block Rate 1 (\$/1,000 gal)	\$1.00	\$1.25
Block Rate 2 (\$/1,000 gal)	\$2.00	\$2.25
Block Rate 3 (\$/1,000 gal)	\$3.00	\$3.25
Block Rate 4 (\$/1,000 gal)	\$4.00	\$4.25
Final Block Rate (\$/1,000 gal)	\$5.00	\$5.25

**Number of Accounts**

	2012	Growth Rate:
	Existing	
Residential Water	3000	0.50%
Residential Sewer	2500	0.50%
Commercial Water	200	0.50%
Commercial Sewer	80	0.50%
Irrigation Water	3000	0.50%

**Miscellaneous**

	2012
	Existing
Uncollected Bills	8.0%
Non-revenue Water	15.0%

**Rate Structure**

**Irrigation Rates**

Irrigation:

	2012	2013
	Existing	New
Irrigation Base Rate	\$0.00	\$0.00
Block Rate 1 (\$/1,000 gal)	\$3.50	\$3.50
Block Rate 2 (\$/1,000 gal)		
Block Rate 3 (\$/1,000 gal)		
Block Rate 4 (\$/1,000 gal)		
Final Block Rate (\$/1,000 gal)		

**Tap Fees**

	2012	2013
	Existing	New
Average Sewer Tap Fee	\$2,000.00	\$2,400.00
Average Water Tap Fee	\$500.00	\$600.00
Average Irrigation Tap Fee	\$2,200.00	\$2,500.00

**Data Input Color Explanation:**

White: Data to be entered, can be changed

Black: Automatically calculated data; do not change!

Red: Important Results

**cubic feet to gallons converter**

100 cubic feet = 748 gallons

**\$/ccf to \$/1000 gallons converter**

\$ 1.00 /hundred cubic feet = \$1.34 /1,000 gallons

Input block sizes (state and end) in gallons/month

Input rates in \$/1000 gallons

Use the converters above for converting from cubic feet units

Copyright © 2012 Environmental Finance Center at The University of North Carolina, Chapel Hill. www.efc.unc.edu

Funded by the NC Department of Environment and Natural Resources and the U.S. Environmental Protection Agency

Instructions Data Input 1 Data Input 2 Charts Fund Balance - Existing Rates Fund Balance - New Rates

Ready Calculate Scroll Lock

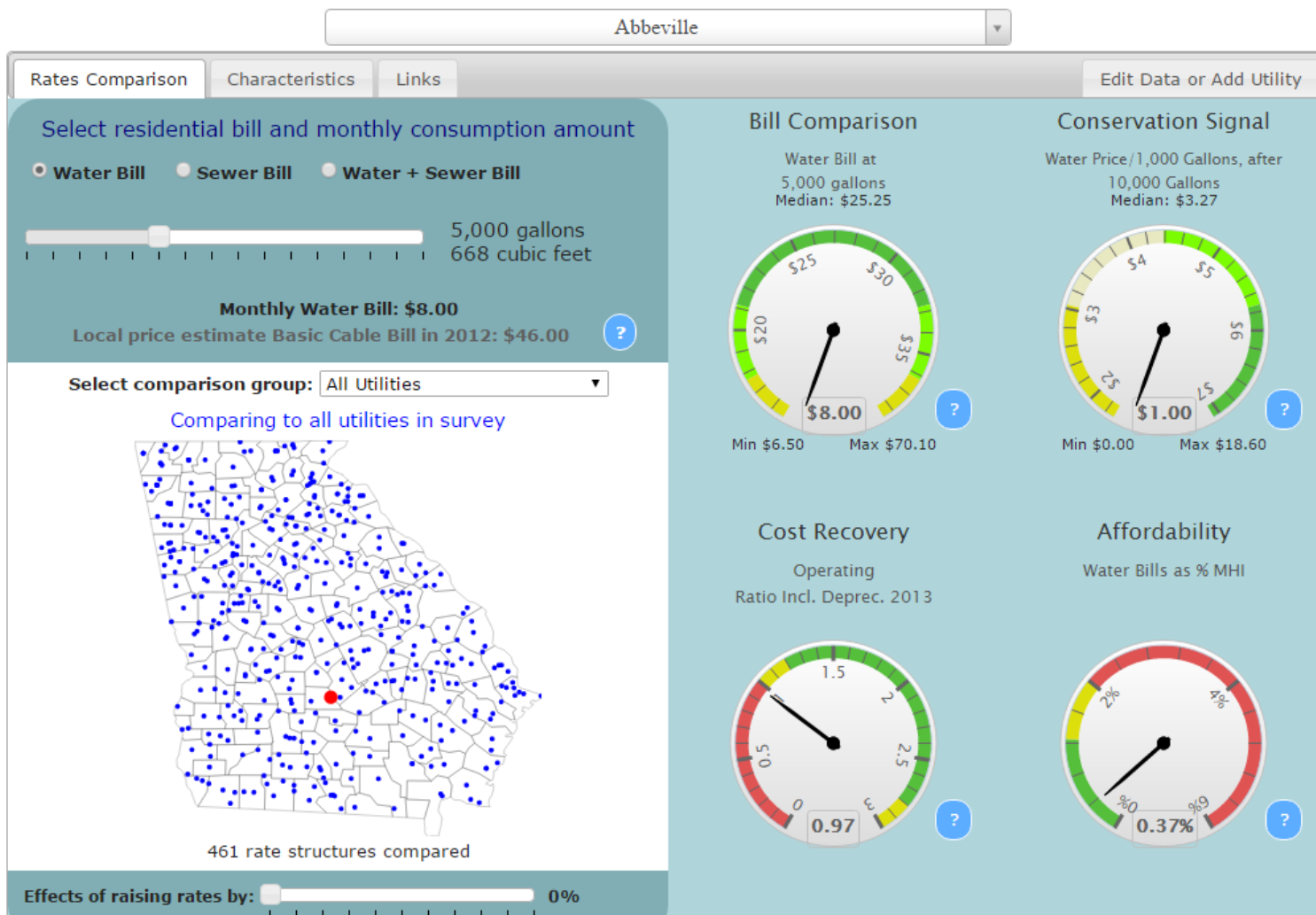


# Water and Sewer Rates Analysis Model

## - Results

- Results are Excel Spreadsheet with:
    - The Fund Balance Under **Existing** Rates
    - The Fund Balance Under **Proposed** Rates
- ...Projected for the next 20 years





## Example of a Rates Dashboard from One State



# Can You Sleep at Night?

Is your system self sufficient?

Operating Ratio

Are you able to cover your debt service after paying for your day to day operations?

Debt Service  
Coverage Ratio

If your customers stop paying their bills, how long can you maintain operations?

Days Cash on  
Hand

Can your system meet its short term obligations?

Current  
Ratio

How much of your system's expected life has already run out?

Asset  
Depreciation



# Whiteboard Video: Financial Benchmarking for Water Utilities

<http://www.waterrf.org/Pages/Projects.aspx?PID=4366>





# Financial Health Checkup for Water Utilities

<http://efc.sog.unc.edu> or <http://efcnetwork.org>

Find the most up-to-date version in Resources / Tools

**Financial Health Checkup for Water Utilities**



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

 **Smart Management for Small Water Systems**  
A resource for water systems through the Environmental Finance Center Network's Smart Management for Small Water Systems project, funded under a cooperative agreement with the U.S. Environmental Protection Agency. <http://efcnetwork.org>

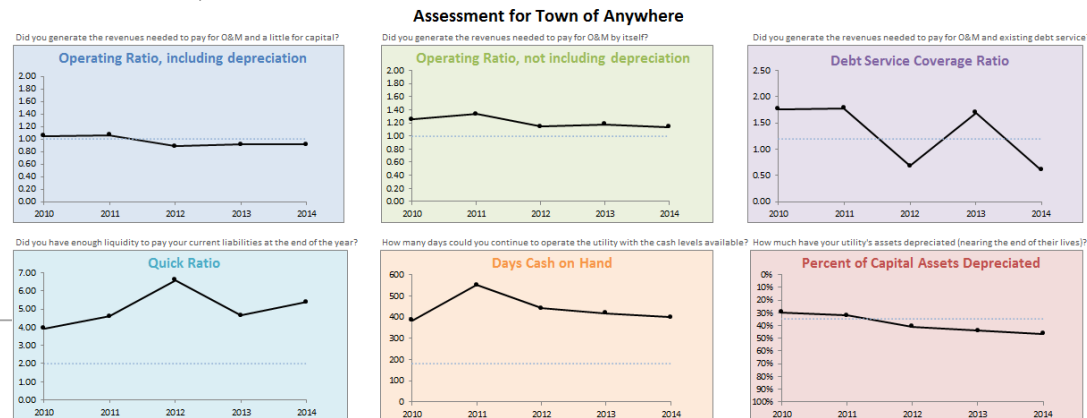
**What does this tool do?**  
This tool assists in the assessment of the financial performance of a water (and/or wastewater) utility fund. Financial data readily available in annual financial statements are copied into this tool, which computes key financial indicators that measure a variety of important metrics, such as the ability to pay debt service, availability of cash to pay for operations and maintenance, the sufficiency of revenues generated, etc. Each metric is compared against targets that are specified by the user. The tool demonstrates the financial strengths and weaknesses of the utility fund in the past 5 years.

**Features:**  
Simple data entry (uses data already reported in your audited financial statements)  
6 financial performance indicators with explanations  
Set your own targets  
Assessment of last year's financial ratios, improvements since previous year, and five-year trends  
Guided navigation through hyperlinked images

**What are financial indicators?**  
Watch a whiteboard video explaining financial performance indicators in lay terms.

 **FINANCIAL BENCHMARKING** 

Excel®- based tool  
Free to use



Created by the Environmental Finance Center at the University of North Carolina, Chapel Hill's School of Government

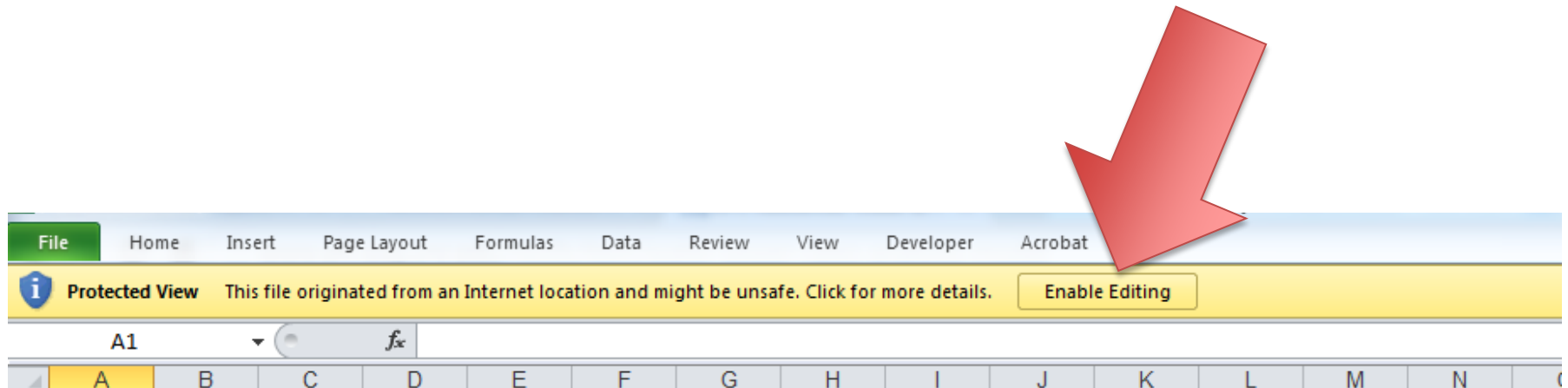
A resource for water systems from the EFCN's Smart Management for Small Water Systems project

[www.efcnetwork.org](http://www.efcnetwork.org)





Tip: when you first use this file after downloading from our website, click on “Enable Editing” at the top







# Why Care About This?

- Funders and ratings agencies care about this
- As you think about the future needs of your system, you have to know where you are starting from



# So....

- Now that we know where we are, let's decide where we are going...
- How do we estimate the future costs and revenues?




# Long Term Capital Planning

# Software: CUPSS (EPA)


<http://www.epa.gov/cupss/>








## Check Up Program for Small Systems


Set-up | Switch Utility | Create User | Help | Training | Exit


 My Home

 My Inventory

 My O & M


 My Finances


 My Check up

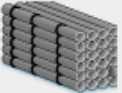
 My CUPSS Plan


Welcome Back Helen, Beauty View Acres Subdivision - DW


What would you like to do today?


[Do Some Training](#)


[Create or Update My Schematic](#)


[Create or Update My Inventory](#)

[Print My Check Up Reports](#)

[Enter a New Task or Work Order](#)

[Search Asset and Maintenance](#)

[Enter My Finances](#)

[Work on My CUPSS Plan](#)

### My Calendar

April 2008

Sun	Mon	Tue	Wed	Thu	Fri	Sat
30	31	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	1	2	3
4	5	6	7	8	9	10

### My Messages and Alerts

Popup Messages Are Off. [Click To Turn On.](#)

Reminder - Today's Tasks	<a href="#">8</a>
Tasks Currently Past Due	<a href="#">160</a>
Assets Needing Update	<a href="#">0</a>
Number of High Risk Assets	<a href="#">2</a>



# Resource Webpage for Capital Planning

UNC SCHOOL of GOVERNMENT

About the School | Courses and Resources | Library | MPA | Publications



search this site

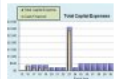
About Services Programs Resources Events

## Mission Statement

We work to enhance the ability of governments and other organizations to provide environmental programs and services in fair, effective and financially sustainable ways.

## Project Tools

### User-friendly Capital Improvement Plan (CIP) Tool for Water & Wastewater Utilities



Calculator, 03/20/2014 (MS Excel, 802 Kb)

Enter in all capital projects and this tool will project your fund balance (revenues, expenses and reserves), and necessary rate increases for the next 20 years, and more!

### What to Include in your Capital Plan:

## PROJECT CAPITAL PLANNING AND WASTEWATER



This project, p  
Support project  
Department of  
together many  
water and was  
creation of a C  
Management P

### Blog Post on "Using an Index to Future"

Read a short blog post on selecting an appropriate

## Summary of

### "What to Include in Your Capital Plan: A Reference Guide for NC Water and Wastewater Utilities"

Last updated: February 2011

Categories	EPA's Asset Management: A Handbook for Small Water Systems	Jack Vogel, DCC Facility's Capital Budgeting and Finance Guide	DEHM PWS Capacity Development Program	DEHM PWS Loans and Grants	G.S. 1506-23	USDA Loans and Grants	NC Rural Economic Development Center	Local Government Development Center	EPA Drinking Water Needs Survey	DEHM DWA Local Water Supply Plans	EPA Software: CIPSS
Goal statement/Introduction to your capital plan	<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	
Date of documentation of capital plan	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
Capital planning time period	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Description of systems		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Existing capacity and demand		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Description of customers		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Inventory of existing assets (details on each asset)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Condition of systems		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Project-specific details (complete for each project in every year)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
Financial planning (complete for each year in time period)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	
Long-term planning descriptions (may be not project-specific)		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Approvals		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			
Updating the capital plan	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
Ties or links to other studies	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		

For updates and to view details in each category, go to <http://www.efc.unc.edu/projects/capitalplanning.html>

Created by the Environmental Finance Center at the UNC School of Government

[www.efcnetwork.org](http://www.efcnetwork.org)





# User-Friendly Capital Improvement Plan (C.I.P.) for Water & Wastewater Utilities Tool

Free, simplified CIP tool using only MS Excel,  
developed by the Environmental Finance Center at UNC.

Download the latest  
version at  
<http://efc.sog.unc.edu>.  
Find it in Resources /  
Tools.

Tool development was funded  
by the  
Public Water Supply Section  
of DWR/ NCDENR  
and partly by the USEPA.

Tool developed by  
**UNC**  
ENVIRONMENTAL  
FINANCE CENTER

**User-friendly Capital Improvement Plan (CIP) for Water and Wastewater Utilities**  
Version 2.5 (Updated March 2014)

20-year capital planning      Debt and/or capital reserve financing options      Guided data inputs      Simple data needs  
Financial dashboard outputs      Estimates necessary rate increases over time to pay for capital projects

**Start**

1) Use tabs at bottom of screen and buttons to navigate to different pages.

Next: Enter C.I.P. Projects      View Fund Balance  
View Dashboard

2) In "Data Input 1", enter utility characteristics, rates and usage information in blue cells.

3) In "Data Input 2", enter details on capital improvement projects in the light blue cells. Each row is a different project.

4) In "20-Year Projections", view your fund balance projections for 20 years and observe the estimated rate increases needed each year to pay for your Capital Improvement. No data entry required on this page.

5) After all your utility information and capital improvement project details are entered, go to the "Dashboard" to view long term trends in your financial reserves, rate increases and average bills, and capital investments.

**INSTRUCTIONS**

**FINANCED**  
6      \$ 950,000  
at      \$ 750,000

**Pre-Exist**  
Input annu  
incurred for

**Capital Improvement Projects - 20 Years**

Project	Construction Start Year	Construction End Year	Annual Construction Cost (\$/Year)	Estimated Cost in the Year	\$/Year
Project 1 - System Expansion	2015	2016	1,000,000	1,000,000	1,000,000
Project 2 - Sewer System Upgrade	2017	2018	2,000,000	2,000,000	2,000,000
Project 3 - Capital Reserve Investment	2016	2017	500,000	500,000	500,000
Project 4 - Indirect Costs	2015	2016	1,500,000	1,500,000	1,500,000

**Expected Revenues and Expenses in FY15**

Category	Amount (\$)	% of Total
Annual Operating and Nonoperating Revenues	5,000,000	100%
Annual Non-Capital Expenditures (O&M, Admin, etc.)	5,000,000	100%
Expected Annual Inflation of Expenditures (%/Year)	2.5%	

**Usage Billed to Customers in FY15**

Category	Amount (\$)	% of Total
Number of Customers	10,000	100%
Total Monthly Use (1,000's of gallons)	20,000	100%
Monthly Rate Charge (Minimum Charge)	1.00	100%

**Estimated Rate Changes Needed to Maintain the Fund Balance**

Category	FY15	FY16	FY17	FY18
Base Charges	\$ 1,776,960	\$ 1,796,322	\$ 1,867,268	\$ 1,936,733
Usage Charges	\$ 3,129,840	\$ 3,094,595	\$ 3,276,588	\$ 3,261,742
Revenues from Other Sources Besides Charges	\$ 103,200	\$ 104,266	\$ 105,344	\$ 106,433

**Financial Reserves (End of Year)**

**Total Capital Expenditures**

**Total Cumulative System Investment**

Copyright © 2013 Environmental Finance Center at the University of North Carolina, Chapel Hill. [efc.sog.unc.edu](http://efc.sog.unc.edu)  
Development of this tool was funded by the NC Department of Environment and Natural Resources (Public Water Supply Section) and the U.S. Environmental Protection Agency  
[Download the latest version of this tool at efc.sog.unc.edu](http://efc.sog.unc.edu). Find it in Resources / Tools.



[www.efcnetwork.org](http://www.efcnetwork.org)

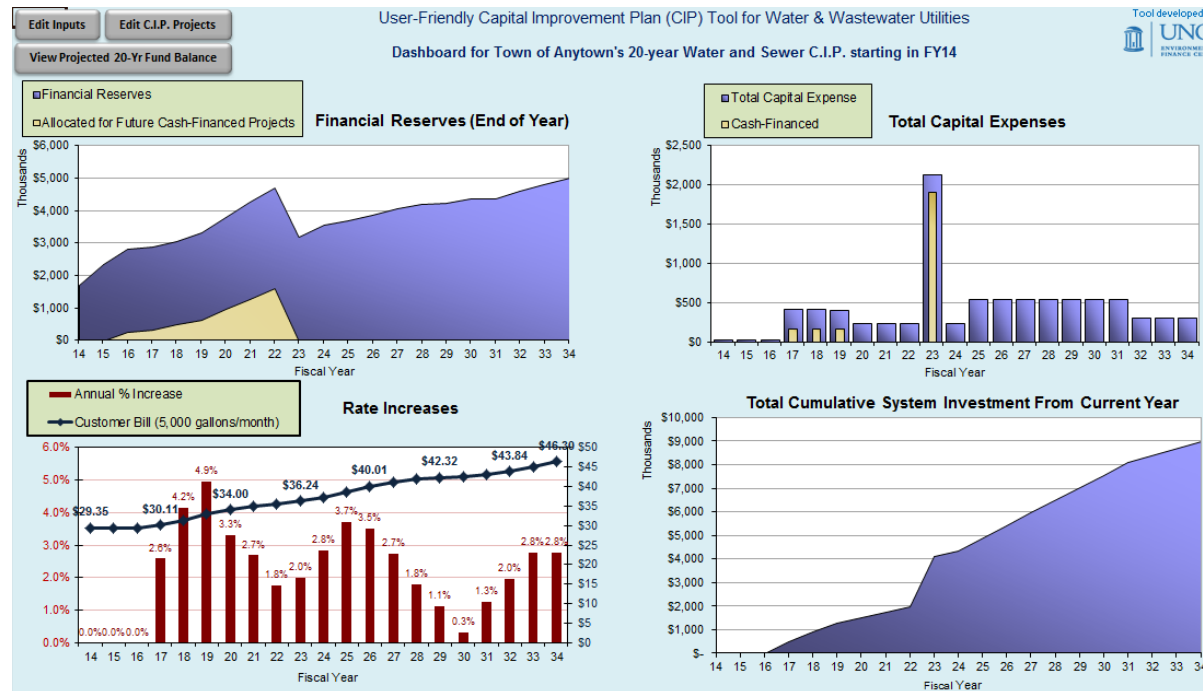


UNC  
ENVIRONMENTAL FINANCE CENTER



# What the Tool Does

Summarizes your utility's capital needs in the next 20 years, and estimates rate increases needed to fully fund the capital projects, based on debt and/or cash funding requirements





# Affordability of Water and Sewer Rates and the Affordability Assessment Tool

- On the EFC Website  
Go to <http://efc.sog.unc.edu>  
and search for “Affordability Assessment Tool”

Tool developed by the Environmental Finance Center at the University of North Carolina, Chapel Hill

## Water & Wastewater Rates Affordability Assessment Tool

### Interactive Spreadsheet Tool

Version 1.0 (July 22, 2014)

This tool allows users to enter relevant Census data on their service community to help assess the affordability of their water or wastewater rates on their residential customers. The tool also allows for a new rate structure to be entered to see how affordability compares from one rate structure to the next.

In the "Inputs" worksheet, fill in all yellow-colored cells.

**Data Inputs**

**1) Utility Information**  
Name of the utility:  
Select the state, District of Columbia, or Puerto Rico from the dropdown menu:  
Assess affordability of water, wastewater or combined water & wastewater rates?

**2) Monthly Charges at [Near] the Average Residential Water Use**  
What is the approximate average residential monthly consumption?

4,300 gallons/month or

**Begin data inputs**

In the "Assessment" worksheet, the tool automatically populates tables and charts to assist you in assessing the affordability of your utility's current and alternative rates for the average customer, low-income customers, and customers of varying ranges of income.

	Current rates	Alternative rates
Monthly water & wastewater bill at 5000 gallons/month	\$77.50	\$84.05
Annual bills at same level of use	\$930.00	\$1,008.60
Median Household income in 2012 for Carthage	\$33,664	
Water & Wastewater % MHI	2.76%	2.99%

Water & Wastewater Rates Assessed at 5000 Gallons/Month and the 2012 Income Levels





# More EFC Related tools

[sog.efc.unc.edu](http://sog.efc.unc.edu) → resources → tools

## Tools Developed by the EFC at UNC

- [Capital Improvement Plan \(CIP\) Tool for Water and Wastewater Utilities, version 2.0](#)
- [Water & Sewer Rates Analysis Model, version 2.0](#)
- [Dashboard for Using Capital Reserve Fund to Avoid Rate Shock](#)
- [Customer Assistance Program Costing Tool](#)
- [Rates Dashboards for Several Different States' Water and Wastewater Utilities](#)
- [Revolving Fund Model](#)
- [Loan Assistance Program](#)



*Are you interested in technical assistance for your small water system? (choose one)*

- Yes
- No
- Would Like More Information About This





# Contact:

Stacey Isaac Berahzer

Environmental Finance Center

University of North Carolina at Chapel Hill

770-509-3887

[berahzer@unc.edu](mailto:berahzer@unc.edu)