

The EFC's Water & Sewer Rates Analysis Model

February 26, 2014 – National Webinar

Sponsored by the U.S. Environmental Protection Agency.

One of several webinars conducted by the Environmental Finance Center Network for the Smart Management for Small Water Systems project.



Shadi Eskaf
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efc.sog.unc.edu

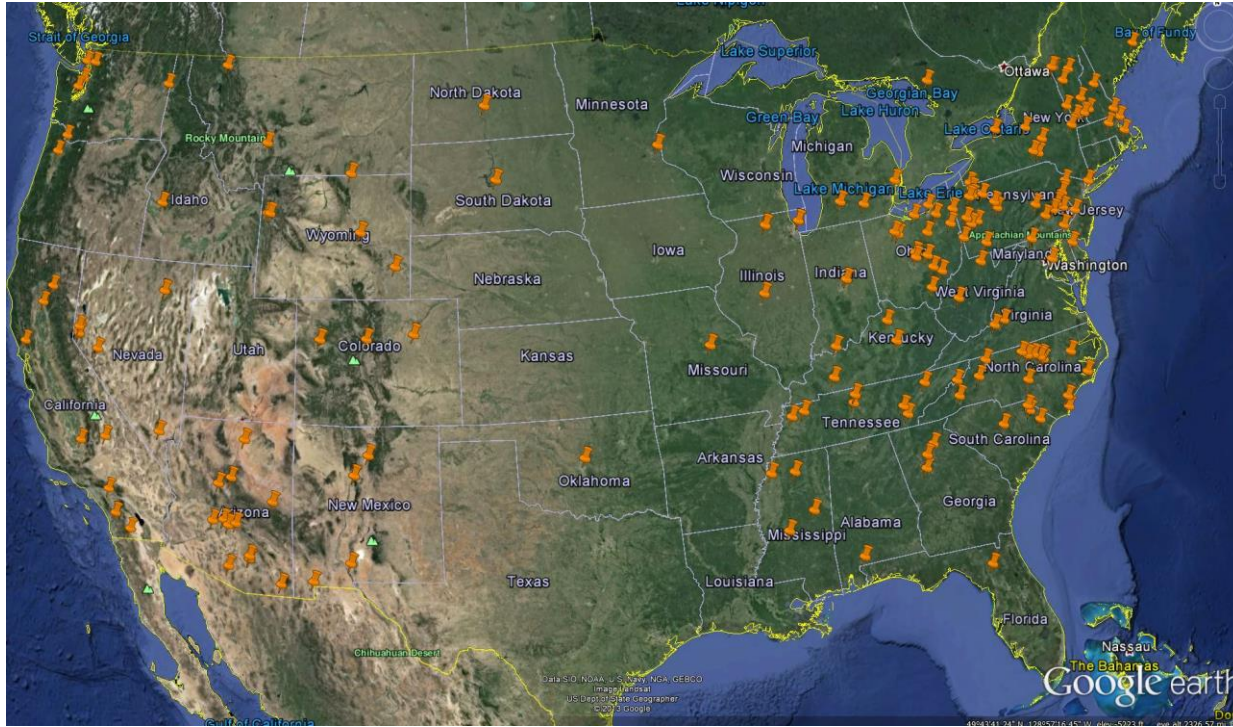


Tara Colleen Baron
Environmental Finance Center at
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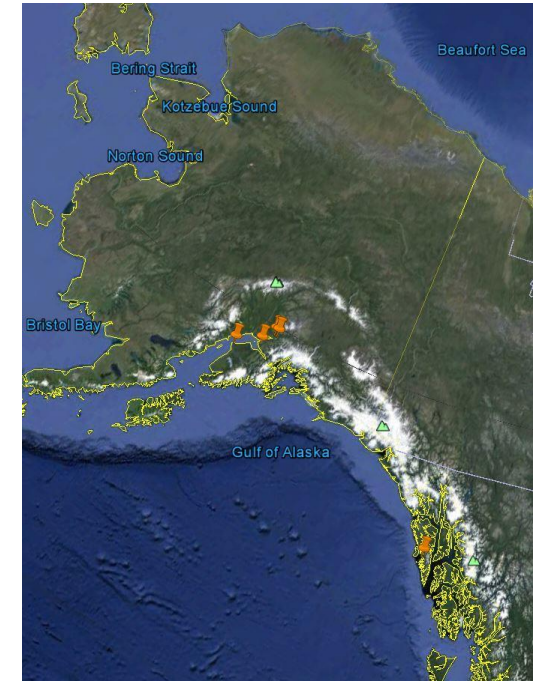
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Webinar registrations as of this morning



Continental U.S.



Alaska



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



Featured Work



The EFC Awarded \$2M for its Smart Management for Small Water Systems Project

The EPA recently announced the EFC at UNC Chapel Hill and the entire Environmental Finance Center Network as one of four successful grantees for the 2013 competitive award to provide training and technical assistance to small water systems in both rural and urban communities.



Featured Report: Defining a Resilient Business Model for Water Utilities

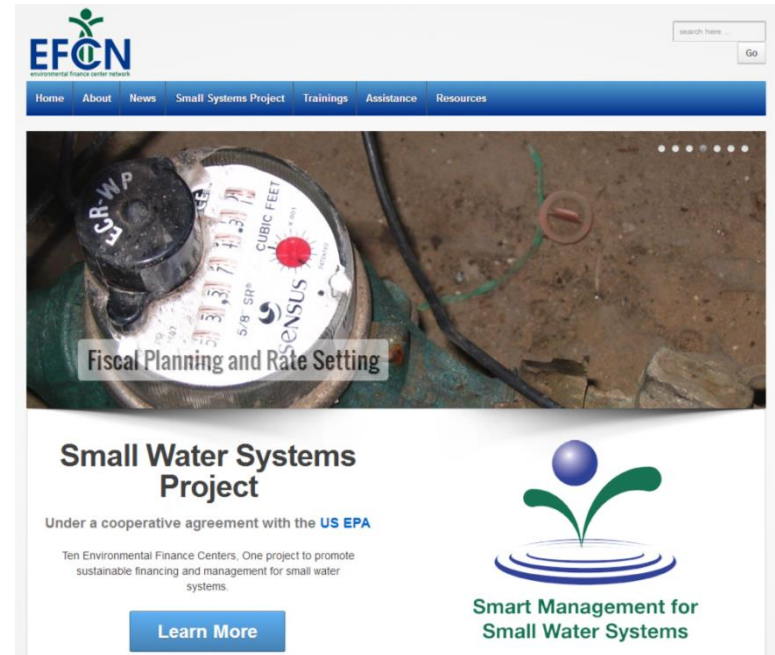
The Environmental Finance Center and the Water Research Foundation partnered to



www.efcnetwork.org



<http://efcnetwork.org>



Smart Management for
Small Water Systems



Smart Management for Small Water Systems

under a Cooperative Agreement with the US EPA



- The EFCN provides training and technical assistance to small public water systems in all fifty states and five territories to help local water systems achieve and maintain compliance with the Safe Drinking Water Act.
- Workshops, trainings and direct assistance are provided on:
 - Asset Management
 - Water Loss Reduction
 - Water System Collaboration
 - **Fiscal Planning and Rate Setting**
 - Energy Management
 - Funding Coordination, and
 - Managerial and Financial Leadership
- Sign up for direct assistance at <http://efcnetwork.org/one-on-one/>



Poll

Where do you work?

Please select one:

- Governmental water system
- Non-governmental water system
- State/Territorial/Federal government
- Consultant / Technical Assistance Provider
- Other



Poll

For water systems: How many customers do you serve?

Please select one:

- 10,000 or fewer people (< 3,300 accounts)
- More than 10,000 people
- Not a water system



Water and Sewer Rates Analysis Model

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

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

UNC ENVIRONMENTAL FINANCE CENTER

Water and Sewer Rates Analysis Model

Version 2.6

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.
- 3) On the **"Data Input 2"** tab enter current consumption levels, utility finances, and other assumptions in the dark green cells.
- 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"**.

Rate Structure

Residential Rates	Existing	2012
Water Base Rate	\$10.00	
Water:		
Block Rate 1 (\$/1,000 gal)	2,001 gal/mo	\$1.00
Block Rate 2 (\$/1,000 gal)	5,001 gal/mo	\$2.00
Block Rate 3 (\$/1,000 gal)	7,001 gal/mo	\$3.00
Block Rate 4 (\$/1,000 gal)	12,001 gal/mo	\$4.00
Final Block Rate (\$/1,000 gal)	12,001 gal/mo	\$5.00
Sewer Base Rate	\$10.00	
Sewer:		
Block Rate 1 (\$/1,000 gal)	2,001 gal/mo	\$1.00
Block Rate 2 (\$/1,000 gal)	5,001 gal/mo	\$2.00
Block Rate 3 (\$/1,000 gal)	7,001 gal/mo	\$3.00
Block Rate 4 (\$/1,000 gal)	12,001 gal/mo	\$4.00
Final Block Rate (\$/1,000 gal)	12,001 gal/mo	\$5.00

Utility Expenses Excluding Debt Service (\$ per year)

During FY2013	Existing	FY2013
Starting Fund Balance		\$ 1,750,000
Salaries and Wages, Including Part-Time and Contract	\$ 200,000	
Supplies	\$ 5,000	
Utilities	\$ 5,000	
Administrative Expenses	\$ 5,000	
Lab	\$ 5,000	
Routine Repairs & Maintenance	\$ 20,000	
Water Purchase	\$ 20,000	
Sewage Availability Service	\$ 20,000	
Other Treatment & Delivery Expenses	\$ 100,000	
Depreciation of Cash Capital Expenses Excluding Debt Service	\$ 15,000	
Miscellaneous Annual Expenses	\$ 15,000	

Assumptions After FY2013

During FY2013	Existing	FY2013
Inflation of Utility Expenses (%/year)	4.00%	

Fund Balance Policy

Projected End of Year Fund Balance

Projected Operating Ratio: Total Revenue / Total Expenses Incl. Capital Costs

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.

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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>. Find it in Resources / Tools.



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

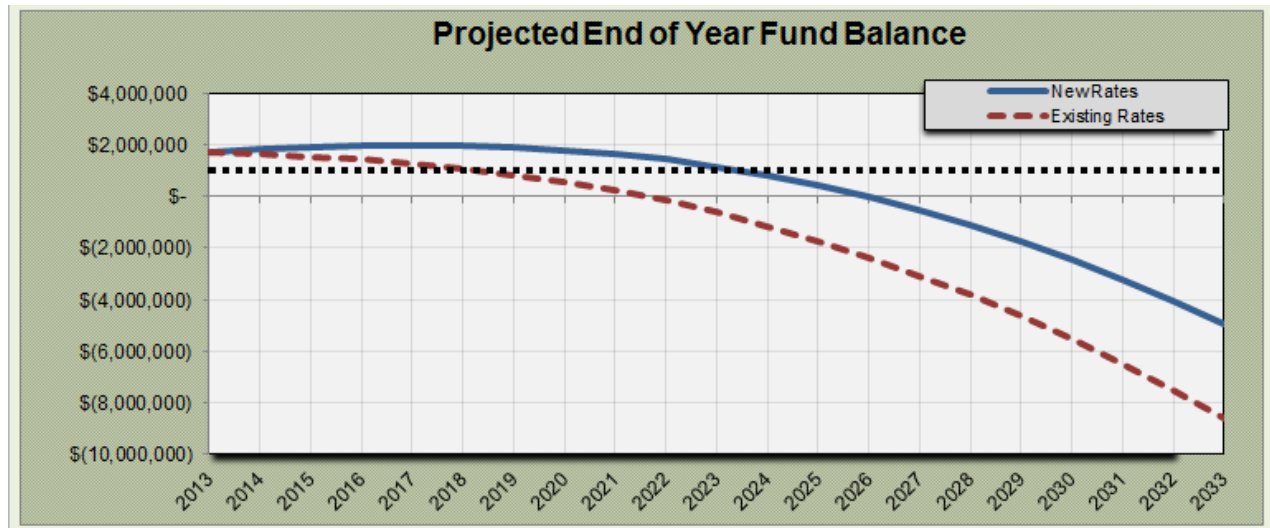


Development was funded
by the **Public Water
Supply Section of the
North Carolina
Department of
Environment and Natural
Resources**, and by the
**U.S. Environmental
Protection Agency**



What the tool does

Forecasts end-of-year fund balance for next 20 years, based on rates, water use, expenses



What the tool does

Projects revenues from flat charges, uniform rates or block rates

- For water, sewer and irrigation
- For residential and commercial rate structures

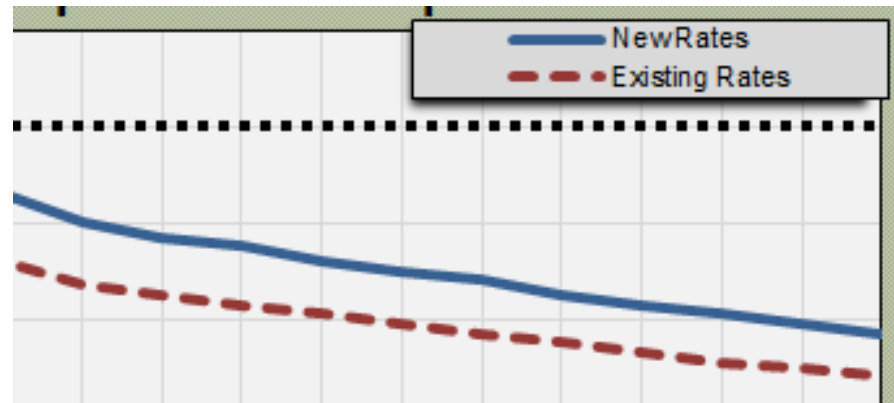
Rate Structure					FY:	2013
Residential Rates					Existing	
Water Base Rate					\$16.00	
Water:		Block Start:		Block End:		
Block Rate 1 (\$/1,000 gal)	-	gal/mo	3,000	gal/mo	\$2.00	
Block Rate 2 (\$/1,000 gal)	3,001	gal/mo	8,000	gal/mo	\$2.00	
Block Rate 3 (\$/1,000 gal)	-	gal/mo	-	gal/mo		
Block Rate 4 (\$/1,000 gal)	-	gal/mo	-	gal/mo		
Final Block Rate (\$/1,000 gal)	8,001	gal/mo			\$2.00	
Sewer Base Rate					\$18.00	
Sewer:		Block Start:		Block End:		
Block Rate 1 (\$/1,000 gal)	-	gal/mo	3,000	gal/mo	\$2.00	
Block Rate 2 (\$/1,000 gal)	3,001	gal/mo	8,000	gal/mo	\$2.00	
Block Rate 3 (\$/1,000 gal)	-	gal/mo	-	gal/mo		
Block Rate 4 (\$/1,000 gal)	-	gal/mo	-	gal/mo		
Final Block Rate (\$/1,000 gal)	8,001	gal/mo			\$2.00	



What the tool does

- Compares two rate structures side-by-side
- Allows you to tweak and adjust numbers and observe effects on end-of-year fund balance

FY:		2013	2014
		Existing	New
		\$16.00	\$20.00
<i>Block End:</i>			
3,000	gal/mo	\$2.00	\$1.75
8,000	gal/mo	\$2.00	\$2.25
-	gal/mo		
-	gal/mo		
		\$2.00	\$4.25
		\$18.00	\$22.00
3,000	gal/mo	\$2.00	\$1.75
8,000	gal/mo	\$2.00	\$2.25
-	gal/mo		
-	gal/mo		
		\$2.00	\$4.25



What the tool does

Use your own expenses (operating and capital) and customers' water use records

- and simple assumptions on their projections due to trends as well as changing price effects (elasticity)

Assumptions	After FY2013
Inflation of Utility Expenses (%/year)	4.00%
Residential:	
Change in Average Consumption Every Year (%/year)	-1.0%
Reduction in Average Use in FY2014 per 10% increase in rates	-3.0%
Commercial:	
Change in Average Consumption Every Year (%/year)	0.0%
Reduction in Average Use in FY2014 per 10% increase in rates	-2.0%
Irrigation:	
Change in Average Consumption Every Year (%/year)	-2.0%
Reduction in Average Use in FY2014 per 10% increase in rates	-5.0%



“Simple” tool = some limitations

(in this version)

- Limited to the options and assumptions included. Cannot add more complexity.
 - e.g.: by meter size, seasonal rates, more blocks, different expense trends over time, etc.
- Projects 20 years based on only ONE rate change (for the upcoming year), not multiple rate changes.
 - Tool is meant to be used every year, not to set rates several years ahead of time



Poll

How do you analyze and set your rates?

Please select ALL that apply:

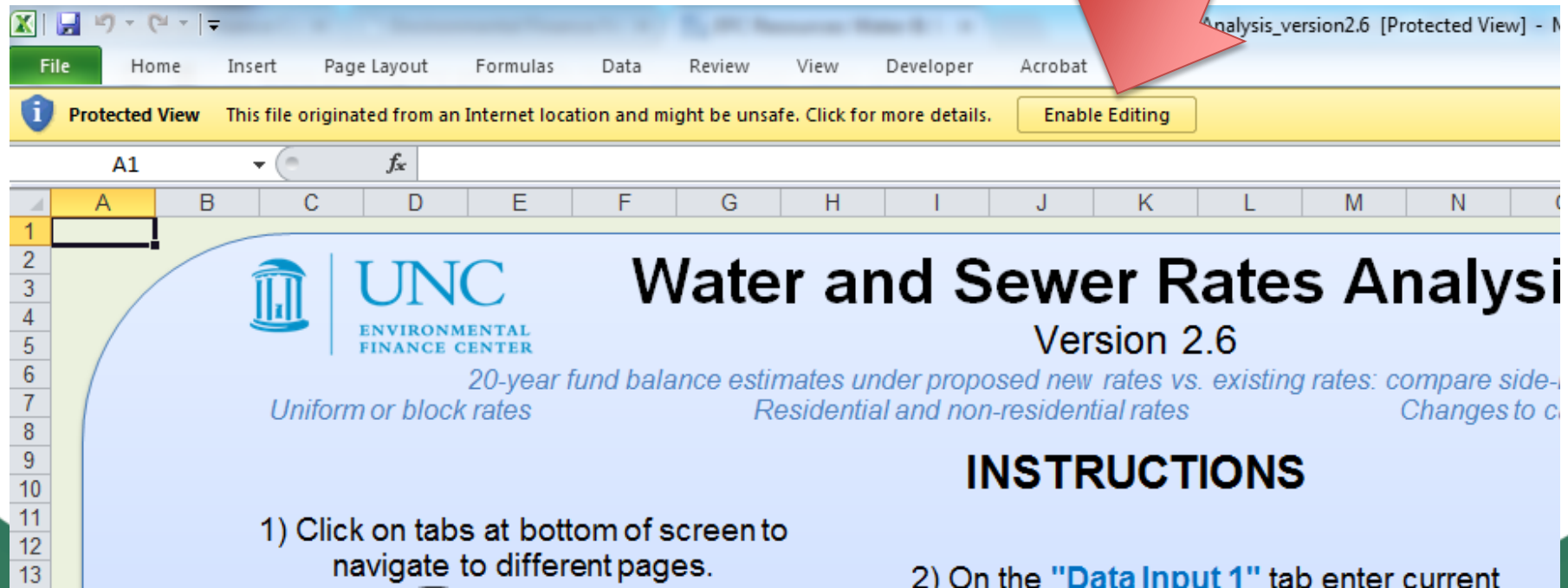
- Used this tool (Rates Analysis Model)
- Used other rate-setting calculators (external)
- Internal analysis without using tools
- Consultant/Technical Assistance Provider helped us
- Not applicable



This tool is designed to assist utilities in modeling the potential cash-flow impacts of a change to their water and/or wastewater rates. However, use of this tool by itself is not a substitute for a more detailed rates study, which should occur periodically.



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UNC ENVIRONMENTAL FINANCE CENTER

Water and Sewer Rates Analysis
Version 2.6

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 current rates

INSTRUCTIONS

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


2) On the "Data Input 1" tab enter current



Demo of the Water and Sewer Rates Analysis Model



Q & A



Water and Sewer Rates Analysis Model

Version 2.6

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.
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- 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"**.

During FY2013

Existing	During FY2013
12,239,000 (gal/month)	1,500,000 (gal/month)
5,500 (gal/month)	3,000,000 (gal/month)
	1,000,000 (gal/month)
	1,000,000 (gal/month)
	1,000,000 (gal/month)
	2,400,000 (gal/month)
	1,000,000 (gal/month)
	1,430,000 (gal/month)
	2,500,000 (gal/month)
	1,000,000 (gal/month)

Starting Fund Balance

Fund Balance at the Beginning of FY2013: \$ 1,750,000

UTILITY Expenses Excluding Debt Service (\$ per year)

During FY2013	Existing
Salaries and Wages, Including Part-Time and Contract	\$ 200,000
Supplies	\$ 8,000
Utilities	\$ 5,000
Administrative Expenses	\$ 3,000
Lab	\$ 5,000
Routine Repairs & Maintenance	\$ 20,000
Water Purchase	\$ 150,000
Depreciation (excl. Cash Capital Expenses Excluding Debt Service)	\$ 100,000
Miscellaneous Annual Expenses	\$ 15,000

Assumptions

After FY2013

Inflation of Utility Expenses (%/year): 4.00%

Rate Structure

Residential Rates

Existing	2012
Water Base Rate	\$10.00
Block Rate 1 (\$/1,000 gal)	2,001 gal/mo \$1.00
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Block Rate 3 (\$/1,000 gal)	7,001 gal/mo \$3.00
Block Rate 4 (\$/1,000 gal)	12,001 gal/mo \$4.00
Final Block Rate (\$/1,000 gal)	12,001 gal/mo \$5.00

Water

Block Rate 1 (\$/1,000 gal) 2,001 gal/mo \$1.00

Block Rate 2 (\$/1,000 gal) 5,001 gal/mo \$2.00

Block Rate 3 (\$/1,000 gal) 7,001 gal/mo \$3.00

Block Rate 4 (\$/1,000 gal) 12,001 gal/mo \$4.00

Final Block Rate (\$/1,000 gal) 12,001 gal/mo \$5.00

Sewer

Block Rate 1 (\$/1,000 gal) 2,001 gal/mo \$1.00


Block Rate 2 (\$/1,000 gal) 5,001 gal/mo \$2.00

Block Rate 3 (\$/1,000 gal) 7,001 gal/mo \$3.00

Block Rate 4 (\$/1,000 gal) 12,001 gal/mo \$4.00

Final Block Rate (\$/1,000 gal) 12,001 gal/mo \$5.00


Residential Water Monthly Bills



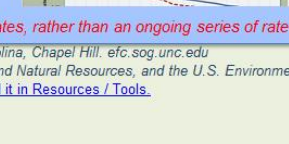
Existing Rates

Year	Existing Rates	New Rates
2013	\$4,800,000	\$4,776,000
2014	\$4,800,000	\$4,776,000
2015	\$4,800,000	\$4,776,000
2016	\$4,800,000	\$4,776,000
2017	\$4,800,000	\$4,776,000
2018	\$4,800,000	\$4,776,000
2019	\$4,800,000	\$4,776,000
2020	\$4,800,000	\$4,776,000
2021	\$4,800,000	\$4,776,000
2022	\$4,800,000	\$4,776,000
2023	\$4,800,000	\$4,776,000
2024	\$4,800,000	\$4,776,000
2025	\$4,800,000	\$4,776,000
2026	\$4,800,000	\$4,776,000
2027	\$4,800,000	\$4,776,000
2028	\$4,800,000	\$4,776,000
2029	\$4,800,000	\$4,776,000
2030	\$4,800,000	\$4,776,000

Projected End of Year Fund Balance



Projected Operating Ratio: Total Revenues / Total Expenses Incl. Capital Costs



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.

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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.



Poll

For systems with 10,000 or fewer people: Would you like our help in working with this tool?

Please select one:

- Yes
- No
- Yes, but system serves more than 10,000 people

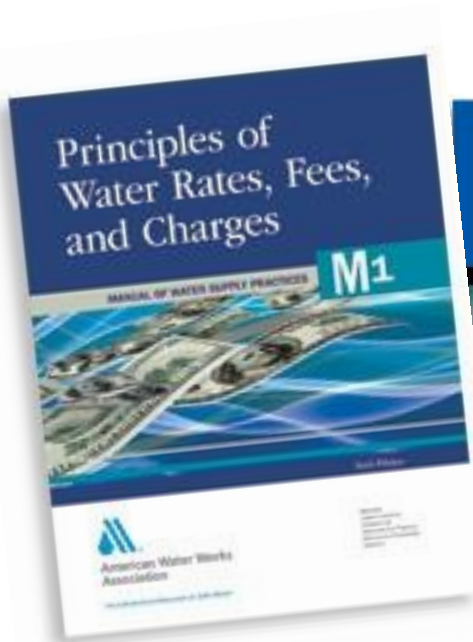


Rate Setting Resources



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>



Rate Setting Resource

Free guide written for utility managers. Also applies to non-NC utilities.

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

Find it in Resources / Publications

Designing Rate Structures that Support Your Objectives: Guidelines for NC Water Systems

June 2009



Funding support for these guidelines provided by the Public Water Supply Section of the North Carolina Department of Environment and Natural Resources, and the United States Environmental Protection Agency

Other EFC Financial Tools

E.g.: C.I.P. tool that estimates effects on rates.
Find all tools in Resources / Tools: <http://efcnetwork.org>

Tool developed by **UNC ENVIRONMENTAL FINANCE CENTER**

User-friendly Capital Improvement Plan (CIP) for Water and Wastewater Utilities

Version 2.4 (Updated November 2013)

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.

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

Capital Improvement Projects - 20 Years

Project Name	Project Construction Period (years)	Project Construction Cost (\$)	Annual Construction Cost Factor (1/Year)	Estimated Cost at the Start of Year	End of Year
Project 1 - New Main Installation	FY12	1	1	1,000,000	1,000,000
Project 2 - Sewer Main Installation	FY17	2	1	2,000,000	2,000,000
Project 3 - Capital reserves financed portion	FY17	3	1	500,000	500,000
Project 4 - Immediate projects, start next year	FY16	1	1	100,000	100,000
Project 5 - replaces O&M	FY25	5	1	3,500,000	2,813,167

Water and Sewer Rates in FY15

Input the residential combined water & sewer rates at 5,000 gallons/month of use for 8.7 cubic foot. Current by monthly rates.

Volume Rate at 5,000 gallons/month (5,000 gallons)	Rate
Monthly Rate (Volume) <td>13.14</td>	13.14

Usage Billed to Customers in FY15

Number of Customers	Residential	Non-residential
50,000	2,000	
Total Monthly Use (1,000 ft of gallons)	50,000	20,000
Annual Customer Rate Growth (%/year)	1.9%	1.9%

Estimated Rate Changes Needed to Maintain the Fund Balance

	FY15	FY16	FY17	FY18
1 Year Increase (Decrease) in Rates (Rate and Volume)	N/A	0.0%	5.1%	2.6%
Increase (Decrease) in the Monthly Bill for 5,000 Gallons	N/A	\$0.00	\$1.01	\$0.79
Increase (Decrease) in the Monthly Base Charge	N/A	\$0.00	\$0.64	\$0.34
Monthly Base Charge ("Minimum Charge")	\$12.34	\$12.34	\$12.98	\$13.31
Volume Rate at 5,000 gallons/month (5,000 gallons)	\$5.67	\$5.67	\$5.96	\$6.11
Volume Included with the Base Charge (1,000 ft of gallons)	2	2	2	2
Approximate Monthly Charge for 5,000 gallons (\$)	\$29.35	\$29.35	\$30.96	\$31.65

Projected Fund Balance

	FY15	FY16	FY17	FY18
Total Revenues	\$ 1,776,960	\$ 1,796,322	\$ 1,907,288	\$ 1,976,733
Base Charges	\$ 3,129,840	\$ 3,094,895	\$ 3,216,568	\$ 3,261,742
Interest Earned from Previous Year's Positive Balance	\$ -	\$ 9,485	\$ 9,167	\$ 9,687
Revenues from Other Sources Besides Charges	\$ 103,200	\$ 104,266	\$ 105,344	\$ 106,433
Total Revenues, Including Other	\$ 5,009,999	\$ 5,005,568	\$ 5,238,367	\$ 5,354,605

Financial Reserves (End of Year)

Rate Increases

Total Capital Expenses

Total Cumulative System Investment

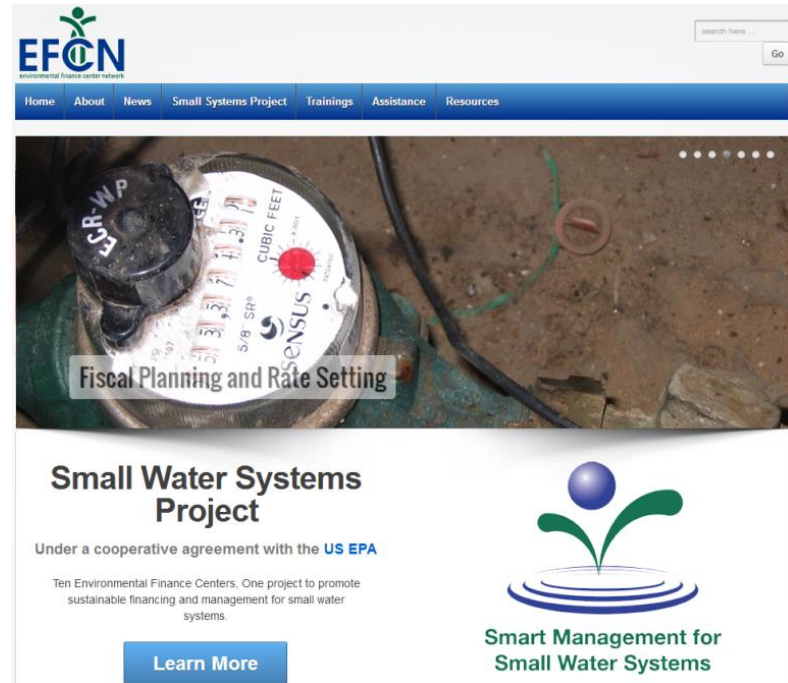
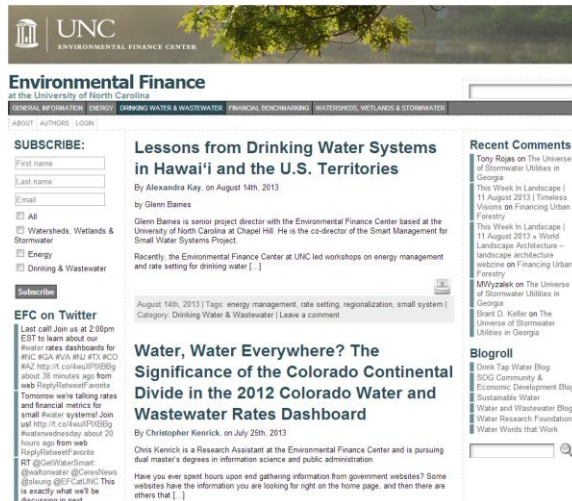
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Some EFCN Resources

Tools, trainings, assistance and resources for small water systems: www.efcnetwork.org

Environmental Finance blog
(EFC UNC)
efc.web.unc.edu/



Poll

For systems with 10,000 or fewer people: Do you want one-on-one help with...

Please select ALL that apply:

- Developing a budget for your water system
- Calculating key financial indicators
- Understanding how future capital projects will impact your revenue needs
- Setting rates
- Determining whether your rates are affordable for your customers



Poll

For systems with 10,000 or fewer people: Do you want one-on-one help with...

Please select ALL that apply:

- Creating an asset management inventory
- Understanding your system's water loss
- Managing the energy use of your system
- Understanding available loan and grant programs



Poll

**Would you like us to subscribe you to the EFC-UNC
“Environmental Finance” blog (drinking water
topics)?**

- Yes
- No



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U.S. Environmental Protection Agency.

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