

Dealing with Declining Water Demand and Decreasing Customers

December 3, 2019

www.efcnetwork.org









Agenda

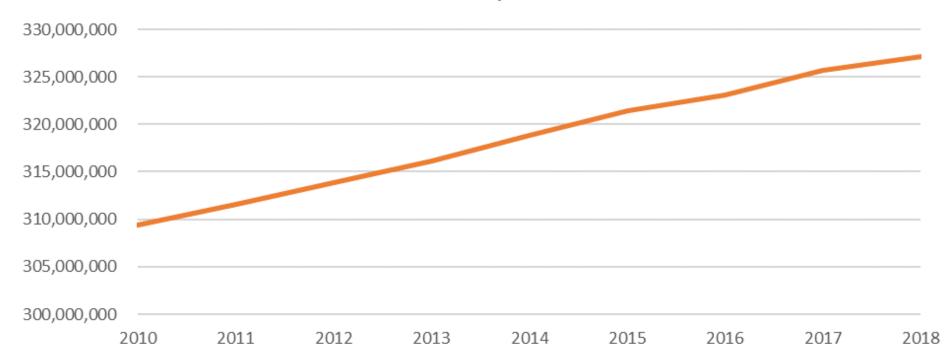
- 1. Demonstrate the extent to which water systems have declining customers and demands
- 2. Describe the effects of declining customers and demands on water systems' finances
- 3. Present strategies to mitigate the financial effects of losing demand/customers
 - i. Financial strategies
 - ii. Structural and managerial strategies



Trends in Population and Water Demand

Total Population in the U.S. is Growing

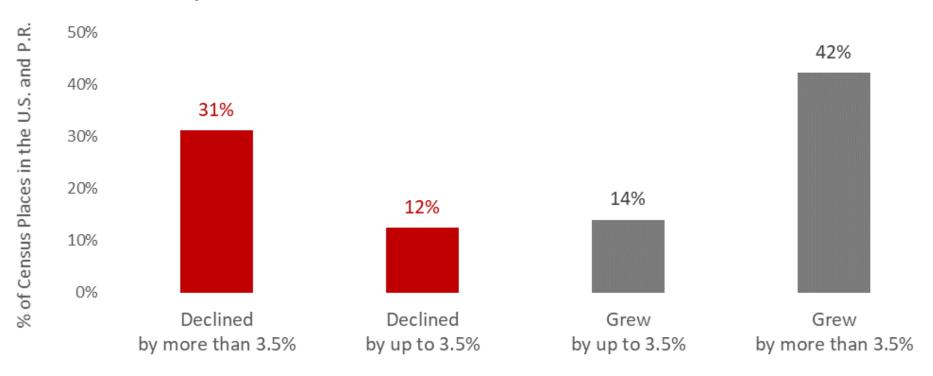
U.S. Total Population



Source: Census Bureau 1-year ACS population estimates.

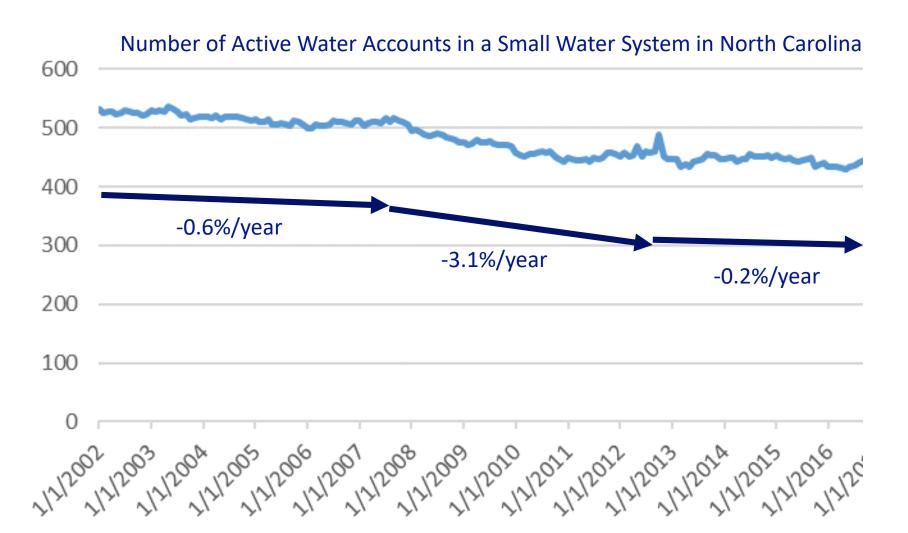
But Many Areas are Losing Population

Population Growth and Decline between 2010 and 2017



Source: Census Bureau 5-year ACS population estimates for all Census Places (2010 and 2017).

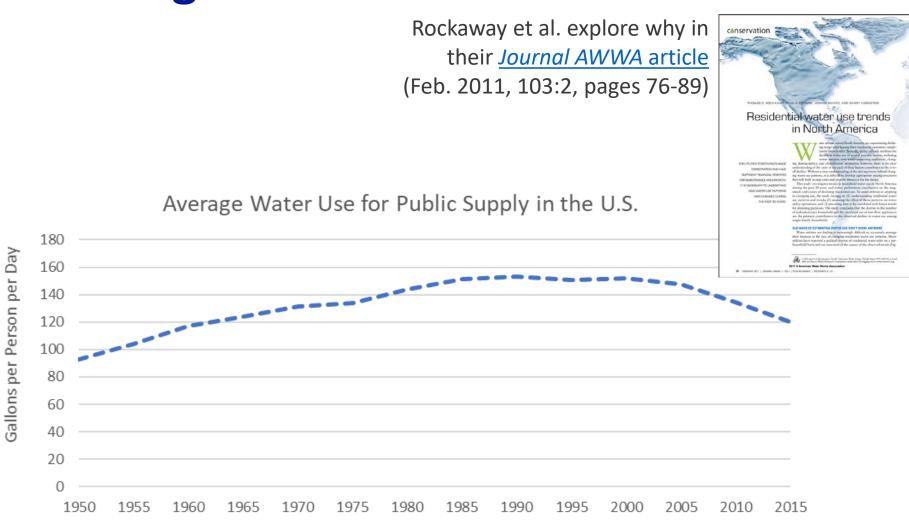
Translates to Declining Number of Water Customers at the Local Level for Some



Population change 2010 to 2017 among webinar registrants' cities NORTHWEST Cities with declining populations Cities with slower than average growth **Growing** cities SASKATCHEWAN Houston Gulf of Mexico Mexico Dominican

Population change 2010 to 2017 among webinar registrants' small cities NORTHWEST Cities with declining populations Cities with slower than average growth **Growing** cities DAKOTA MONTANA San Francisco CALIFORNIA oLas Veçes Houston Gulf of Mexico Mexico

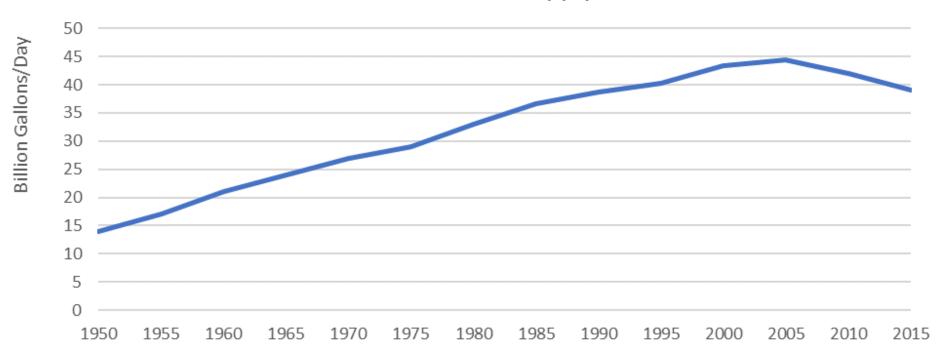
Average Water Use is On the Decline



Source: U.S.G.S. Water Use Data on total public water supply use and total population.

→ Total Water Use is Declining

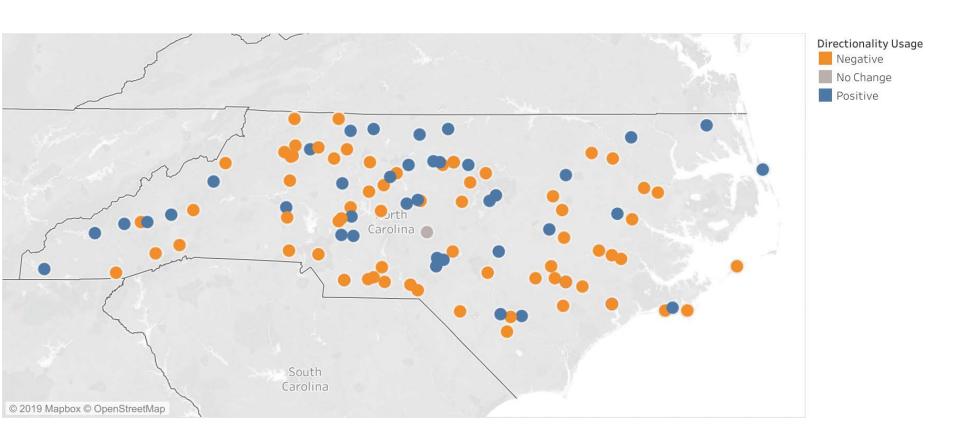
Total Water Use for Public Supply in the U.S.



Source: U.S.G.S. Water Use Data.

Trends in Residential Water Use in NC

Between 2002 and 2017



Financial Impacts of Declining Populations and Demands

Most Common Revenue Sources

- Retail customer sales
- Wholesale customer sales
- Penalties, fees, etc.
- One-time connection/system development fees
- Revenues not related to water provision
- In some circumstances: taxes

Customer Sales Account for the Vast Majority of Revenues for Most Systems

- Retail customer sales
- Wholesale customer sales
- Penalties, fees, etc.
- One-time connection/system development fees
- Revenues not related to water provision
- In some circumstances: taxes

Revenues from Customer Sales

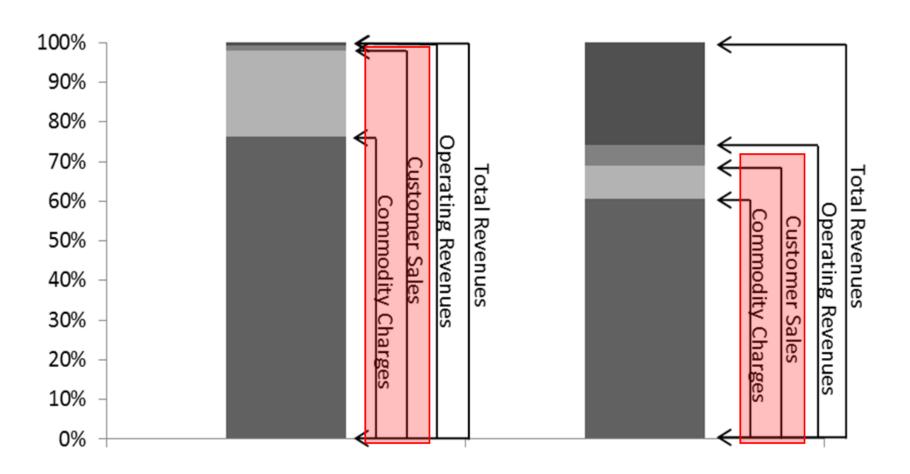
Fixed revenues from the fixed (base) charges

(e.g. \$30.00/month minimum charge)

+

Variable revenues from the volumetric (commodity) charges (e.g. \$7.00/1,000 gallons)

Commodity Charges (from Volumetric Rates) are Often a Large Proportion of Customer Sales and Total Revenue



Source: Water Research Foundation report, 2014, Defining a Resilient Business Model for Water Utilities.

Revenue Exposure to Declines

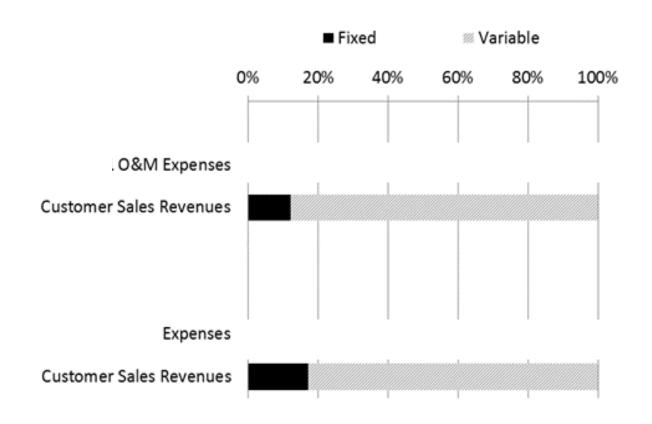
When water use declines → revenues from volumetric rates (commodity charges) decline

When number of customers decline → revenues from fixed monthly charges (base charges) decline, and, likely, water use declines ... see "1".

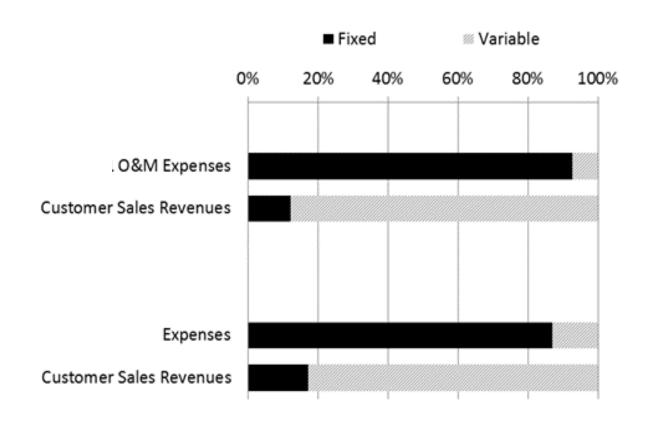
But What about Costs?

When water use declines, operating costs will also go down too. Will this offset the declines in revenue?

Fixed versus Variable Costs and Revenues



Fixed versus Variable Costs and Revenues

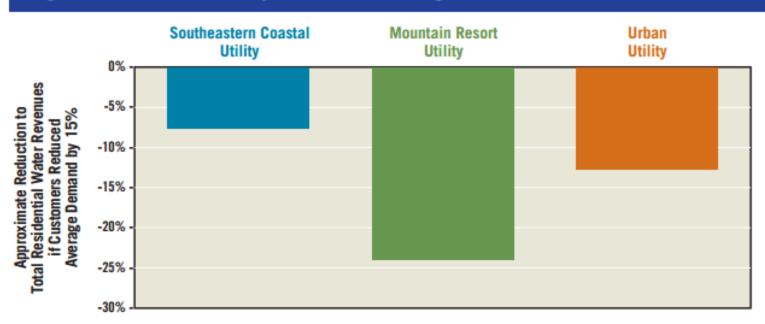


In most water systems, as water use decreases, revenues will go down faster than costs in the short term.

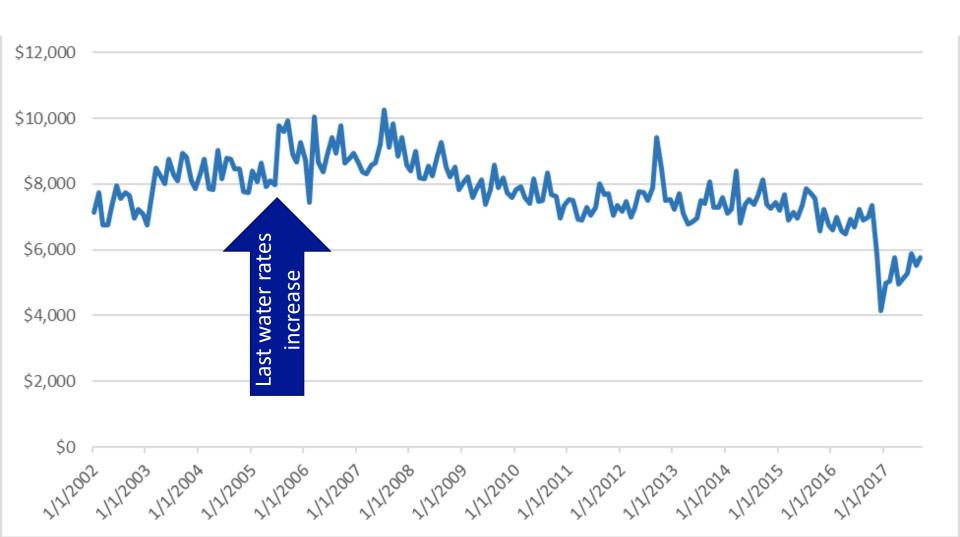
But by how much?

Effect of Reducing Average Demand by 15% on Three Utilities' Revenues

Figure 3: Revenue Variability Due to One-Time Significant Declines in Residential Demands



Water Revenues at the Example Utility



Financial Strategies to Mitigate Losses from Declining Demands

Financial Strategies

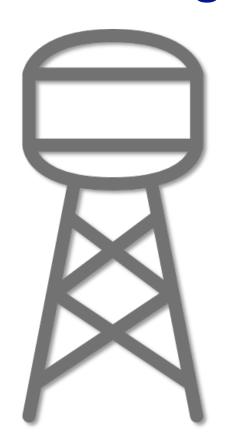
- Reduction and management of operating costs
- Management of capital expenditures
- Build up reserves
- Revenue enhancement
- Rate adjustment approaches
- Alternative rate designs
- Financial performance targets

Non-Revenue Water / Water Loss



Limit the amount of water that leaks out of pipes and the amount for which you don't charge.

Asset Management



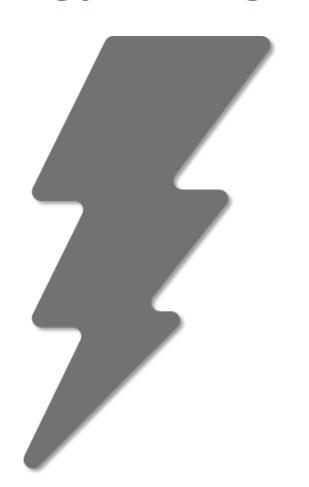
Maximize the useful life of assets and reduce maintenance costs by prioritizing rehabilitation/replacement projects on what needs it the most.

Partnerships with Other Water Systems



Purchase supplies in bulk. Contract labor part-time. Share equipment. Train each other.

Energy Management



Reduce and optimize energy use through process or equipment changes, time of operation changes, using the Energy Portfolio Manager, etc.

Track and Monitor Expenditures



Compare expenditures monthly against the budget, and track trends in expenditures over 3-5 years. Identify whether slow increases or spikes can be controlled.

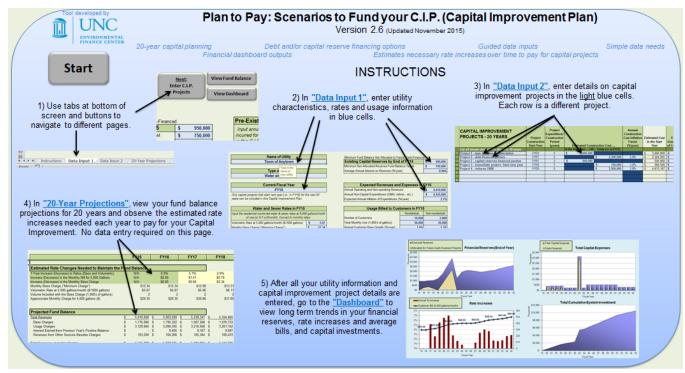
Management of Capital Expenditures

- Re-examine the need for expansions and extensions
- Have a capital plan
- Have a plan on how to fund capital (debt or cash?)
- Explore and test funding scenarios
- Look into debt refinancing if applicable
- Get a (higher) credit rating if applicable
- Partner with other utilities on regional capital projects to reduce costs and achieve higher priority points

Plan to Pay: Scenarios to Fund your C.I.P.

<u>http://efc.sog.unc.edu</u> or <u>http://efcnetwork.org</u>
Find the most up-to-date version in Resources / Tools

Free, simplified Excel tool allowing you to list your capital projects and plans for funding them, and automatically estimates rate increases



Build Up Reserves

Reserves are funds built up over time that you can use for various purposes.

Build reserves early: before signs of problems.

If you are already suffering from loss of customers or water use, it might be too late, unless you can raise rates quickly.

Many Types of Reserve Funds

- Operating Reserves
- Repair Fund
- Emergency Fund
- Rainy Day Fund (Revenue Shortfall Fund)
- Rate Stabilization Reserves
- Debt Service Reserves
- Capital Reserves
- Renewal and Extension Reserves
- ...

How Much Do You Need In Your Reserves Specifically to Deal with Declining Demands?

Look into setting a minimum target for a reserve fund to cover a reasonable decline in revenues so that you can continue to operate the water system and buy yourself enough time to make additional adjustments to mitigate the loss.

Consider, for instance, a reserve that would cover at least three or four months of all O&M expenses. More would be better.

Examples of Targets for Reserves by Some Larger Utilities

Utility	Reserve Fund Targets
City of Minneapolis, MN	15% of revenue budget for the next year
Orange Water and Sewer Authority, NC	The greater of 33% of O&M budget or 20% of the total estimated cost of the succeeding 3 years of the CIP budget
Baltimore Dept. of Public Works, MD	Minimum of 90 days cash on hand
Charlotte Water, NC	100% of operating expenses for the current budget
Water District No.1 of Johnson County, KS	The Board will be notified when the rate stabilization reserve reaches a minimum level of \$2 million

Source: Water Research Foundation report, 2014, Defining a Resilient Business Model for Water Utilities.

Strategy: Build up reserves

Example of Target for Reserves by a Small Water System

Town of Shallotte, NC (2,300 accounts):

"Our Board of Aldermen have always used a 90% rule: keeping at least 90% of current budget on hand in case of emergencies.

Being a coastal community, we realize that a hurricane could do significant damage."

Revenue Enhancement

- Raise rates and fees
- Sell water to neighboring systems
- Generate new revenue from other sources: rethink your utility services!

Examples of New Sources of Revenue

- Rent space for use or advertisement
- Lease water towers for antennas
- Public fire protection charges
- Recreational access fees
- Generate and sell renewable energy
- Sell bottled water
- Reuse water sales
- Sell/contract your services to neighboring water systems:
 - Meter reading
 - Billing
 - Maintenance / operator staff
 - Lab / water testing
 - Engineering / planning
 - Project management

Rate Adjustment Approaches

Raise rates as often as needed (within reason).

If it's politically difficult, consider ways to set

automatic rate increases:

Pass-through charges

- Multi-year rate increases
- Indexed rate adjustments



Adjust Rate Structure Design

- If average water use is declining but number of customers is not, consider shifting revenue generation more towards the fixed charges (i.e. base charges).
- Consider alternative rate models that have much less (or nearly no) dependence on revenues from high volume or high block sales.
- For innovative rate structures, watch
 https://www.youtube.com/watch?v=2yt1Z0GGEsE
 and contact me for more info.

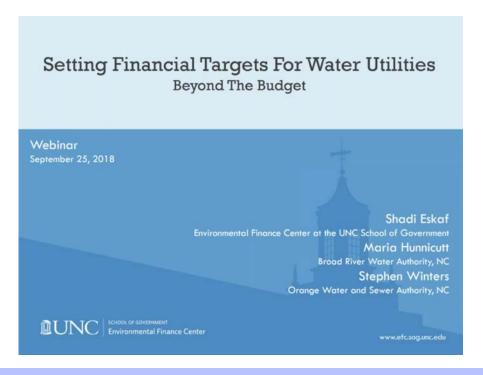
FOR THE WATER INDUSTRY

Set Up and Monitor Internal Financial Performance Targets

Set up specific financial performance targets, measure and monitor performance indicators, and adjust financial decisions to maintain success.

Recorded Webinar on Setting Financial Targets

https://efc.sog.unc.edu/event/setting-financial-targets-water-utilities-beyond-budget



Examples of Financial Targets

Minimum Reserves / Cash on Hand

Working Capital Reserves

Debt Service Coverage Ratio

Debt Burden or Debt-Per-Customer

Cash Financing of Capital Projects

Rates Affordability

Credit Rating

Summary of Financial Strategies

- Reduction and management of operating costs
- Management of capital expenditures
- Build up reserves
- Revenue enhancement
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Structural and Managerial Strategies to Mitigate Losses from Declining Demands

Structural and Managerial Strategies

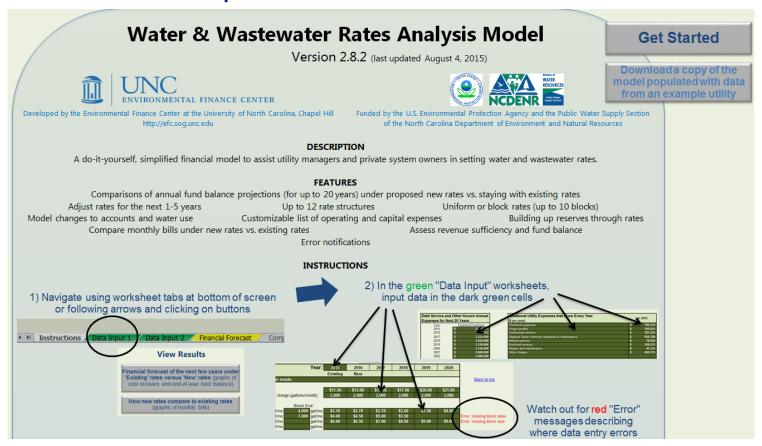
- Planning and adjusting demand forecasts
- Know your (biggest) customers
- Assist with economic development efforts
- Partnerships with other water systems
- Communication

Planning and Adjusting Demand Forecasts

- Conservative forecasts
- Run scenarios, not a single forecast
- Look at your long-term trends to inform forecast
- Incorporate short-term and long-term reductions in demand
- Establish a policy or protocol to move any "excess revenue" into a reserve fund

Water and Wastewater Rates Analysis Model http://efc.sog.unc.edu or http://efcnetwork.org

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



Created by the Environmental Finance Center at the University of North Carolina, Chapel Hill Funded by the U.S. E.P.A. and the N.C. Department of Environment and Natural Resources

Strategy: Planning and adjusting demand forecasts

Know Your (Biggest) Customers

- Identify them from your billing records.
- Determine the potential revenue risk if your largest customer(s) leave.
- Meet with the largest non-residential customers.
 Tour their facilities. Find out how they use water and ask about any potential changes to their demands in the future.
- Use BLS data to find information about industry/commercial customers in your area.

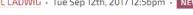
Assist with Economic Development Efforts

- Communicate your capacity excesses, water reliability and quality, and water rates to your elected officials, planners, County's economic development teams, Area Development District, and Chamber of Commerce as a way of advertising you are open for business.
- Consider adjusting rate structures to incentivize business development*.
 - * Check whether your proposal is legal in your state.

Waiving Connection Fees

To fight downtown blight, North Bend approves waiver for new bus

CAROL LADWIG • Tue Sep 12th, 2017 12:56pm • NEWS













Empty buildings and downtown blight will by North Bend soon, but only time will tell if t

"I hope it's successful, in time," said Counci the action, a waiver of water and sewer con businesses into the city's historic downtow we'll change it."

The action, approved in a 6-1 vote allow City Administrator Londi Liv Facilities Charges (GFCs) for sp business owners have made/ improvements, in building mat have been vac "The target businesses are primarily restaurants, breweries and other businesses with a high level of water use."

The target businesses are primarily restaurants, breweries and other businesses with a high level of water use. The CCC waiver specifies the

https://www.valleyrecord.com/news/to-fight-downtown-blight-north-bend-approves-fee-waiver-for-new-businesses/

Bill Discounts for New Businesses

Discounts and Incentive Programs

New qualifying Commercial customers are subject to Incentive Commodity Charges for the first forty-eight months of usage according the following schedule:

First 12 months of Billing	60% of approved commodity rate
Second 12 months of Billing	70% of approved commodity rate
Third 12 months of Billing	80% of approved commodity rate
Fourth 12 months of Billing	90% of approved commodity rate

Qualifications will be determined by the Hannibal Board of Public Works on a case-by-case basis and will consider such things as number and value of local jobs created, length and size of required water main extensions, and estimated annual consumption.

Hannibal, MO

Separate Rate Structure Category and (Typically Lower) Rates for Commercial/Industrial Customers

Residential Rates

0 - 2,000 (Minimum) 2,001 - 6,000

6,001 - 10,000

10,001 - 20,000

All Over 20,000

Current Rates

\$19.67

\$5.79 / 1,000 gals.

\$6.14 / 1,000 gals.

\$9.22 / 1,000 gals.

\$10.75 / 1,000 gals

Commercial Rates

0 - 2,000 (Minimum)

2,001 - 48,000

All Over 48,000

\$29.49

\$3.51 / 1,000 gals.

\$4.10 / 1,000 gals.

Agricultural Rates

0 - 2,000 (Minimum)

2,001 - 48,000

All Over 48,000

\$21.45

\$2.57 / 1,000 gals.

\$3.57 / 1,000 gals.

Wayne Water Districts, NC

Strategy: Assist with economic development efforts

Decreasing Block Rates for Commercial Customers

COMMERCIAL WATER:

or for Very High Volumes

```
WATER RATES –
CONSUMPTION RATES –
1000 – 1,000,000 = 3.75 per 1,000
1,000,000 + = $0.30 per 1,000
```

BASE RATE – 80.00 per residential unit 150.00 per commercial unit

Lancaster, NH

Block Size Based on Meter Size

1" Meter (All Classes)	\$ / 1,000 Gallons
1 to 32,000 Gallons	\$6.72
Over 32,000 Gallons	\$10.34
1 ½" Meter (All Classes)	
1 to 106,000 Gallons	\$6.72
Over 106,000 Gallons	\$10.34
2" Meter (All Classes)	
1 to 195,000 Gallons	\$6.72
Over 195,000 Gallons	\$10.34
3" Meter (All Classes)	
1 to 434,000 Gallons	\$6.72
Over 434,000 Gallons	\$10.34

A. Petersen Water Company, AZ

Partnerships with Other Water Systems

- Share services
- Sell excess water to other water systems
- Buy water from another water system and reduce or eliminate the need for treatment
- Consolidate with other water systems to create a regional utility
- Transfer ownership of your water system

Water System Partnership Spectrum

Increasing Transfer of Responsibility -

Informal Cooperation	Contractual Assistance	Joint Powers Agency	Ownership Transfer
Work with other systems, but without contractual obligations	Requires a contract, but contract is under system's control	Creation of a new entity by several systems that continue to exist as independent entities	Takeover by existing or newly created entity
Examples: • Sharing equipment • Sharing bulk supply purchases • Mutual aid arrangements	Examples: • O&M • Engineering • Purchasing water	Examples: • Shared system management • Shared operators • Shared source water	Examples: • Acquisition and physical interconnection • Acquisition and satellite management • Transfer of privatelyowned system to new or existing public entity

Any kind of collaboration can be helpful

Sharing Services

- Bulk purchase agreements
- Sharing staff
- Using the same contract operator
- Sharing management
- Sharing equipment
- Using the same accounting firm or billing firm
- Shared testing / planning / project management services

Interconnections for Water Systems with Declining Demands to Buy/Sell Water

- If demand is shrinking and you have excess capacity, seek to sell bulk water to a neighboring water system/service area at favorable rates
- If demand is shrinking and you have assets that need rehabilitation/replacement, consider connecting to a neighboring system to purchase water and shut down the treatment plant

Crafting Interlocal Water Agreements

Available at

https://efc.sog.unc.edu/project/utilityregionalization-and-consolidation

- Extensive list of questions to consider, descriptions, example text from existing agreements
- Advice for getting interlocal agreements right, avoid pitfalls
- This is not a draft/template contract



Water System Consolidation: Regional Utility

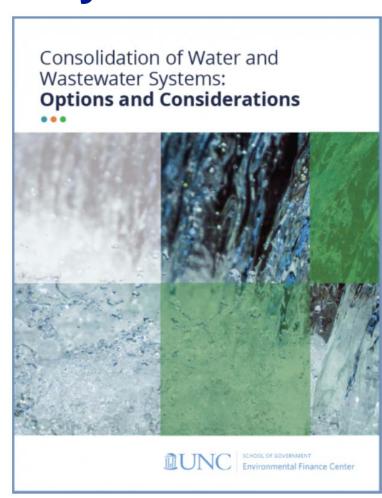
- Work with other water system(s)/communities to create a combined utility that serves a regional area
- Different institutional models available to address governance concerns, including joint ownership
- Receives more favorable consideration of subsidized capital funds
- Receives more favorable outlook by credit rating agencies = lower interest rates

Options and Considerations for Consolidation of Water Systems

Available at

https://efc.sog.unc.edu/project/utility-regionalization-and-consolidation

- Describes variety of "consolidated" water system types and roles/authority of members
- List of questions to consider and advice for systems investigating options for consolidation



Water System Consolidation: Transfer Management or Transfer Ownership

- Could contract out management and operations of the water system to a neighboring (large) utility, perhaps with an interconnection.
- Could divest and transfer the water system to another water system or private entity

Communication

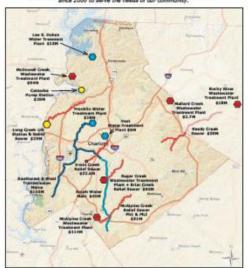
 With staff: recognize the challenges and empower staff to come up with solutions

• With the board: educate on the issues, enable longer-term planning

 With customers: explain why decisions have been made, get buy-in

Communication

Capital Improvement Projects and Investments
This map represents some of the water and sever projects completed
since 2000 to serve the needs of our community.



Water and Sewer Improvemen

Brier Creek Relief Sewer+Sugar Creek Treatment Plant Upgrades	million
Catawba Fump Station Expansion	million
Franklin Water Treatment Plant Expansion	million
Irwin Creek Relief Sewer	million
Lee S. Dukes Water Treatment Plant Improvements	million
Long Creek Lift Station and Relief Sewer	million
Mallard Creek Wastewater Treetment Plant Improvements	million
McAlpine Creek Relief Sewer, Phase I and II	million
McAlpine Creek Westewater Treatment Plant Improvements	million
McDowell Creek Wastewater Treatment Plant Expension	million
New Ready Creek Sewer Line\$39	million
New Rocky River Wastewater Treatment Plant	million
New South Water Main	million
New Southwest Water Main	million
Vest Water Treatment Plant Improvements	

More than \$100 million invested in restoring and maintaining aging water and sewer lines.

Utilities provides weter for fire protection throughout Mecklenburg County and is responsible for repairing 16,000 hydrents and valves.

Cost of Improvements and Investr

Paying for capital and infrastructure projects accounts for 62 cents of every dollar spent by the utility, and is in many ways like a mortgage that has to be paid back over time. Utilities works hard to maintain a AAA-cradit rating. This allows the utility to build new projects at the lowest possible borrowing rate and save millions in interest costs



"Payin (Pay-As-You-Go) uses used for capital project

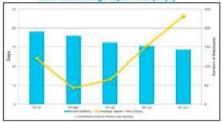
In an effort to maintain lower costs for customers, Utilities has increased its efficiencies in areas like energy management and reduced staffing levels. Utilities has fewer positions today than in 2001.

Water and Sewer Customer Accounts and Staff Positio



The proposed rate increase will put crews back into the field to address water leak backlogs and other maintenance items. Currently, there are 13 pipe repair crews, down from 31. The rate increase will restore 6 additional crews. This would help reduce the service becklog by adding capacity to fix about 16 additional leaks each day on average.

Minor Leak Average Repair Time (Days)



Effective July 1, the proposed rate increase will impact each customer differently based on their water usage. For most residential custom ers, the impact of the new rate structure and tier rates will lead to an incresse from between \$.37 to \$8.99 per month, with most seeing increases between \$4 and \$4.59 per month.



For the typical oustomer who uses 8 Ccf of water each month, the total monthly bill increase will be \$4.59. Of this \$4.59, \$2.85 will pay back

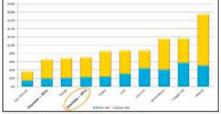
construction loans. The remaining \$1.74 pays for increases for personnel,

A very small percentage of customers will see their total bill decrease because of the reduction in the sewer cap.

Water and Sewer Rates 2011-2012

	2011 (current)	2012 (proposed)
Tier 1 (1-4 Cd)	\$1.45	\$.98
Tier 2 (5-8 Cd)	\$1.64	\$1.96
Tier 3 (9-16 Ccf)	\$2.69	\$3.41
Tier 4 (over 16 Cdf)	\$5.32	\$5.32
Sewer Charges	\$4.31	\$4.14

10 Ccf Customer Bill Comparison to Other Cities



Did you know?

\$1 purchases 400 gallons of water from Utilities.



By comparison, \$1 purchases a single 16.90z bottle of water from the store.

For the same \$1, Utilities delivers 400 gallons of water to customers any time, day or night.

Source: Charlotte Water

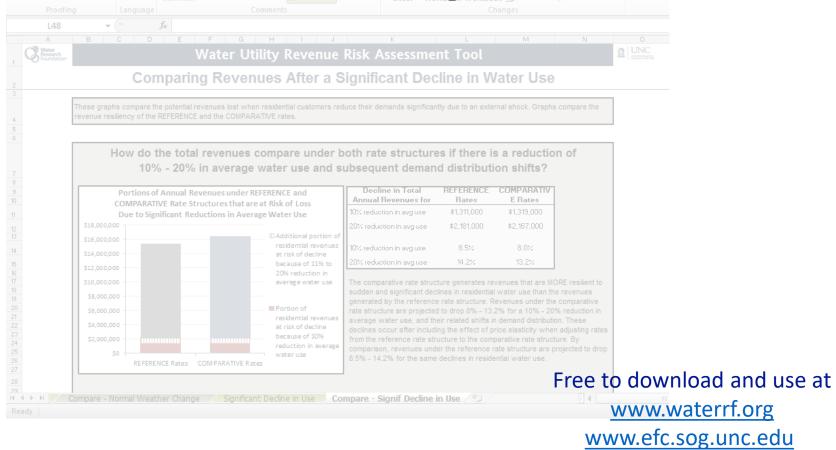
Summary of Structural and Managerial Strategies

- Planning and adjusting demand forecasts
- Know your (biggest) customers
- Assist with economic development efforts
- Partnerships with other water systems
- Communication

Resources

Water Utility Revenue Risk Assessment Tool

Compare the resiliency of current to proposed rate structures from the effects of changes to water use



Defining a Resilient Business Model for Water Utilities

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

Chapter 4: Strategies and Practices for Revenue Resiliency





Defining a Resilient Business Model for Water Utilities



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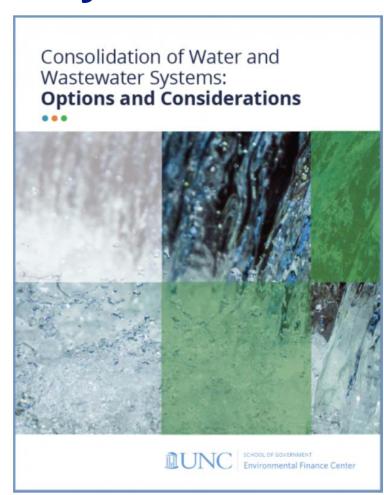


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Visit the EFCN Website – www.efcnetwork.org

for more information on upcoming events, funding, and resources.









http://efcnetwork.org

Resource Library

Select "Resource Library" under the Resources Tab off the EFCN homepage.



For an overview of some of the tools and resources available in our Resource Library, please view our Tools and Resources flyer.

What does your system need help with?

+ We treat more water than we sell.

http://efcnetwork.org

Small Systems Blog

Learn more about water finance and management through our Small Systems Blog! Blog posts feature lessons learned from our training and technical assistance, descriptions of available tools, and small systems "success stories."

efcnetwork.org/small_systems_blog/



Blog



Magdalena, New Mexico: A Success Story from the Smart Management for Small Water Systems Project

Written by: Allison Perch Allison Perch is a Program Coordinator with the Environmental Finance Center at the University of North Carolina. What can a small town do when the financial health of its water system is at risk? This is the question that Stephanie Finch, the town clerk and treasurer for the ...



The Virtuous Cycle: Internal Energy Revolving Funds for Small Water Systems

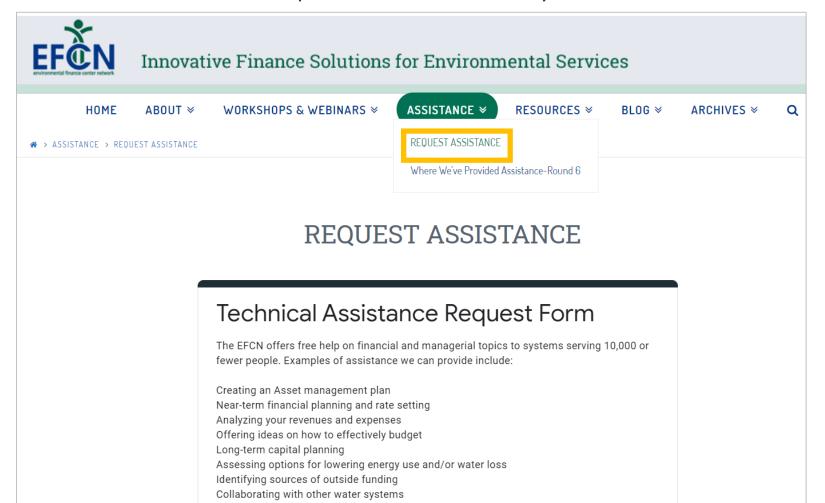
Written by: David Tucker David Tucker is a Project Director with the Environmental Finance Center at the University of North Carolina. How can small (and large) water systems pay for energy efficiency and renewable energy, helping cut utility costs? As energy is often the largest variable expense in a water system's operating _



Smart Management for Small Water Systems Program Newsletter I Fall 2015

Request Technical Assistance

Select "Request Assistance" under the Assistance Tab off the EFCN homepage to access and submit the TA request form electronically. http://efcnetwork.org



Questions?

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eskaf@sog.unc.edu
919.962.2785

Financial Strategies

- Reduction and management of operating costs
- Management of capital expenditures
- Build up reserves
- Revenue enhancement
- Rate adjustment approaches
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Other Strategies

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