



Smart Management for
Small Water Systems

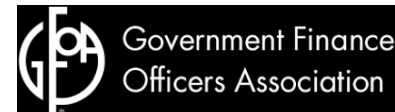
Integrating Sustainability into Daily Decision Making

Wednesday, October 9, 2019

www.efcnetwork.org



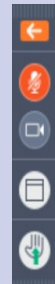
ENVIRONMENTAL
FINANCE CENTER



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

Logistics

Opening the control panel



← Show your control panel

← All phones/microphones are muted

← for the duration of the webinar
Toggle between full screen/window screen view

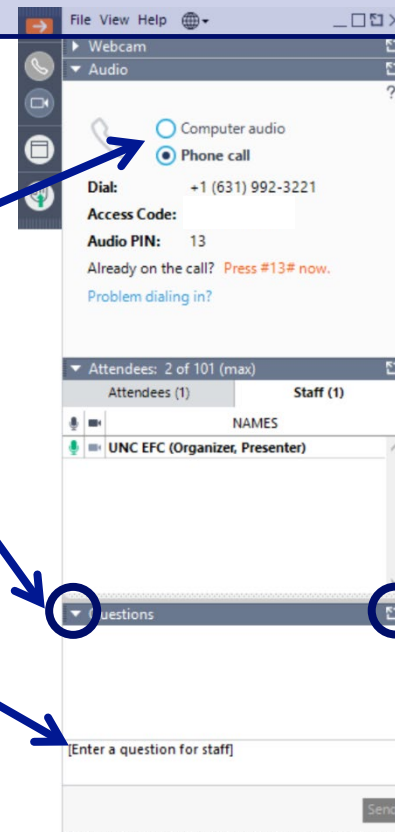
Using the control panel

Audio: please choose between computer audio or phone call

If you do not hear audio right now, please check your speaker volume or enter #[your Audio PIN]# if using phone

Click  to open in Control Panel

Submit **questions** in the Questions box at any time, and press [Send]



Click  to open in separate box and resize



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If you have questions or need assistance, please contact smallsystems@syr.edu.



About Us

The Environmental Finance Center Network (EFCN) is a university-based organization promoting innovative and sustainable environmental solutions while bolstering efforts to manage costs.

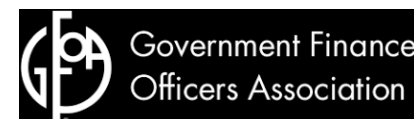


**Smart Management for
Small Water Systems**

The Smart Management for Small Water Systems Program works in every state, territory, and the Navajo Nation. All small drinking water systems are eligible to receive free training and technical assistance.

The Small Systems Program Team

- Environmental Finance Center at The University of North Carolina at Chapel Hill
- Environmental Finance Center at Wichita State University
- EFC West
- Government Finance Officers Association (GFOA)
- Great Lakes Environmental Infrastructure Center
- National Association of Development Organizations (NADO)
- New England Environmental Finance Center at the University of Southern Maine
- Southwest Environmental Finance Center at the University of New Mexico
- Syracuse University Environmental Finance Center
- Environmental Finance Center at the University of Maryland
- Rural Community Assistance Corporation
- Environmental Finance Center at California State University, Sacramento



Areas of Expertise



Asset Management



Rate Setting and Fiscal Planning



Leadership Through Decision-making and Communication



Water Loss Reduction



Energy Management Planning



Accessing Infrastructure Financing Programs



Workforce Development



Water Conservation Finance and Management



Collaborating with Other Water Systems



Resiliency Planning



Managing Drought



Agenda

Orange Water and Sewer Authority

- Case study on Integrating Sustainability into Daily Decision Making

Other Frameworks for Sustainable Utility Management

- Overview of tools and resources

Q&A

Wrap up



Frameworks for Sustainable Utility Management

Tools and Resources



Rural and Small Systems Guidebook to Sustainable Utility Management

Ten Key Management Areas



Self Assessment

Rate Achievement for Each Management Area

"How are we doing?"



Rank Importance of Each Management Area

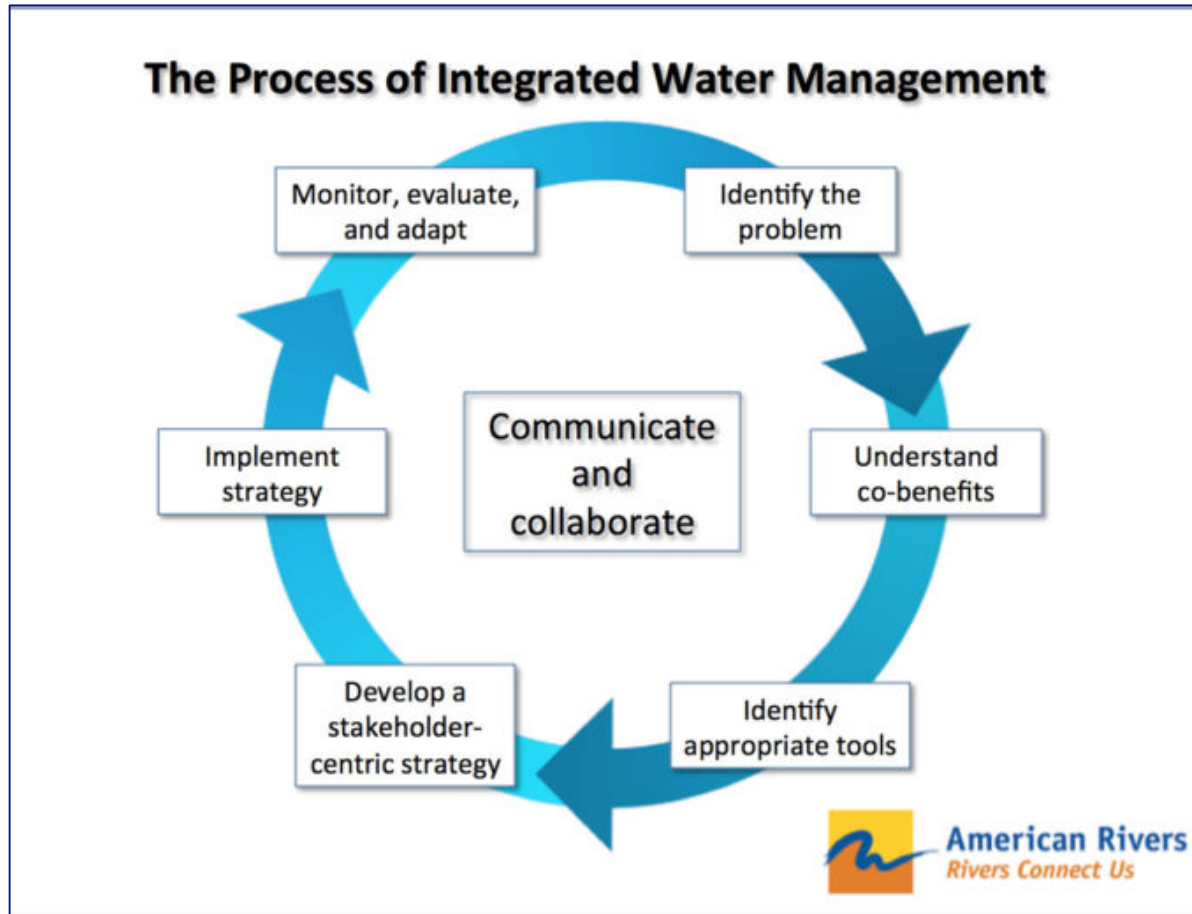
"How important is this to our system?"



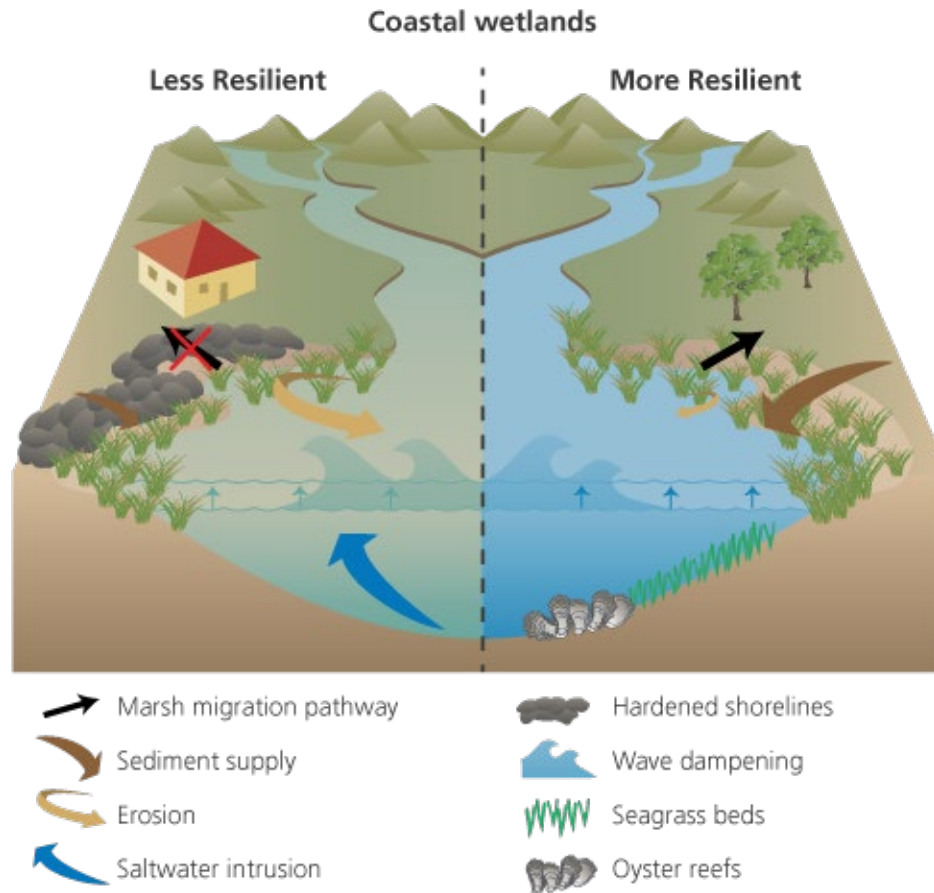
Plot Results to Identify Critical Areas for Improvement

"What are the most important areas for us to focus on as we move forward?"

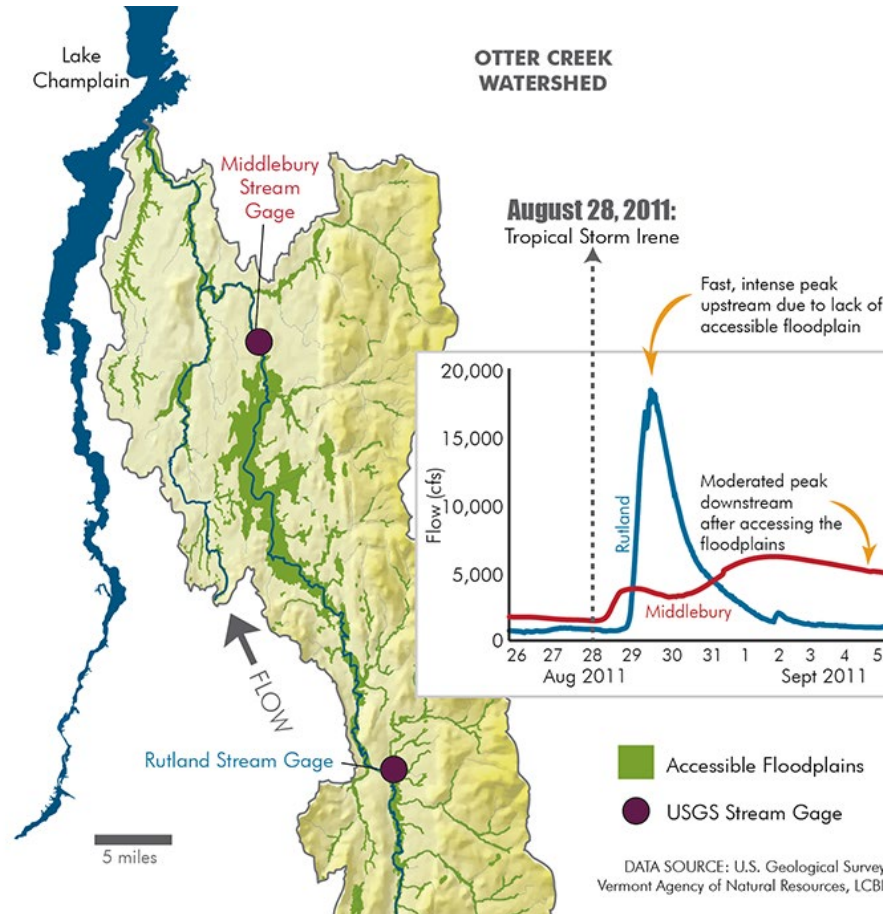
“One Water” Approach



A Tale of Two Towns



Rutland vs Middlebury Vermont



Mean daily flow for Otter Creek in Rutland and Middlebury (McDavitt, 2012)



Flood Resilience: A Basic Guide for Water and Wastewater Utilities

Berwick, Maine



FLOOD RESILIENCE

A Basic Guide for Water and Wastewater Utilities

Select a menu option below.
First time users should start with the Overview.





Flood Resilience: A Basic Guide for Water and Wastewater Utilities

STEP 1

- Understand the Threat of Flooding



STEP 2

- Identify Vulnerable Assets & Determine Consequences



STEP 3

- Identify & Evaluate Mitigation Measures



STEP 4

- Develop Plan to Implement Mitigation Measures

Easy-to-use worksheets

FLOOD RESILIENCE: A Basic Guide for Water and Wastewater Utilities

EPA

Worksheet

STEP 1: Worksheet (page 1 of 2)

To better understand the threat of flooding, your utility should first examine historical flooding data and review Federal Emergency Management Agency (FEMA) Flood Maps. Below are instructions for evaluating the threat of flooding at your utility.

The tables below have sample data. Use the blank tables (double click icon) to input your utility's data.

1.1 Have you reviewed utility records of past flooding events? ☐ Yes ☐ No

If no, review how past flooding events have threatened your utility. Use various sources, including utility records, newspapers, websites and hazard mitigation experts, to collect previous flooding data. Enter your utility's past flooding information into Table 1.

EXAMPLE OF COMPLETED TABLE 1 – PAST FLOODING EVENTS

Event Information (e.g., Date, Name, Type*, Flood Elevation)	Description of Damage (Operational, Public Health and Economic Impacts)
April 2007, "Patriot's Day Storm," Nor'easter, 238.5 ft	Collapsed water storage tank and damage to pump stations and chemical storage. Operated on backup power generator. Boil water notice issued for several days. Financial impacts were roughly \$100,000.

* Tropical storm, hurricane, spring thaw/snowmelt, levee failure, etc.

1.2 What potential sources of flooding could impact your utility?

☐ Swollen rivers/streams ☐ Flash floods ☐ Levee/dam failure

☐ Spring thaw ☐ Coastal flooding ☐ Non-natural causes (e.g., main breaks)

1.3 Have you obtained FEMA Flood Maps? ☐ Yes ☐ No

If no, go to the [Map Service Center](#) to find FEMA Flood Maps, categorized by community. Flood Maps show areas that will be affected by both 100-year and 500-year floods. A "100-year flood" is a flood event that has a one percent chance of occurring in a given year. A "500-year flood" is a flood event that has a two tenths percent chance of occurring in a given year. Click on the icon to learn more about interpreting a Flood Map. If your Flood Map is not up to date, talk with your local community planning department or floodplain manager.

Guide to Interpreting FEMA Flood Maps

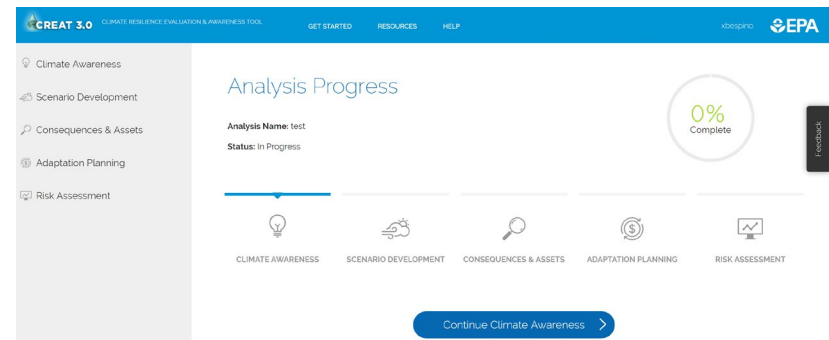
1.4 Identify which floodplains your utility systems are located within.

Locate your utility systems, such as intake, treatment, distribution, storage tank and pump stations, on your community's Flood Map to determine which floodplains they are located within. Summarize your findings in Table 2.

Previous Main Menu Next

Climate Resilience Evaluation and Awareness Tool (CREAT)

- Risk assessment tool
- Helps utilities in adapting to extreme weather events through a better understanding of current and future climate conditions.



Adaptation Strategies Guide for Water Utilities

GROUP		DW	WW
Drought	Reduced groundwater recharge	💧	
	Lower lake & reservoir levels	💧	
	Changes in seasonal runoff & loss of snowpack	💧💧	
Water Quality Degradation	Low flow conditions & altered water quality		💧💧
	Saltwater intrusion into aquifers	💧	
	Altered surface water quality	💧	💧
Floods	High flow events & flooding	💧💧	💧💧
	Flooding from coastal storm surges	💧💧	💧💧
Ecosystem Changes	Loss of coastal landforms / wetlands	💧💧	💧💧
	Increased fire risk & altered vegetation	💧	💧
Service Demand & Use	Volume & temperature challenges	💧💧	💧💧
	Changes in agricultural water demand	💧	
	Changes in energy sector needs	💧	
	Changes in energy needs of utilities	💧💧	💧💧



HIGH FLOW EVENTS AND FLOODING (DW)

[Return to Introduction](#)

Intense precipitation events may occur more frequently, concentrating the annual total rainfall into episodes that may challenge current infrastructure for water management and flood control. When these protections fail, inundation may disrupt service and damage infrastructure such as treatment plants, intake facilities and water conveyance and distribution systems. Episodic peak flows into reservoirs will strain the capacity of these systems. Furthermore, inflow will be of lesser quality due to soil erosion and contaminants from overland flows, leading to treatment challenges and degraded conditions in reservoirs.

CLIMATE INFORMATION

- Since 1991, the amount of rain falling in very heavy precipitation events has been above average across most of the United States (USGCRP 2014). This observed trend has been greatest in the Northeast, Midwest and Great Plains – projections for these regions indicate that 30% more precipitation will fall in very heavy rain events relative to the 1901-1960 average (Karl et al. 2009).
- Heavy downpours are increasing nationally, with especially large increases in the Midwest and Northeast (Kunkel et al. 2012, USGCRP 2014). Precipitation intensity (e.g., precipitation per rainy day) is projected to continue to increase by mid-century for most of the U.S. This change is expected even for regions that are projected to experience decreases in mean annual precipitation, such as the Southwest (Kunkel et al. 2012, Wehner 2013, USGCRP 2014).
- The increasing intensity of precipitation events can be expected to lead to more flooding and high flow events in rivers. For example, by the end of the century, New York City is projected to experience almost twice as many days of extreme precipitation that cause flood damage (Ntelekos et al. 2010). For the U.S. overall, a recent assessment of flood risks found that the odds of experiencing a 100-year flood are expected to double by 2030 (USGCRP 2014).
- The intensity, frequency and duration of North Atlantic hurricanes has increased in recent decades, and the intensity of these storms is likely to increase in this century (USGCRP 2014).

[Click to left of name to check off options for consideration: \\$'s \(\\$-\\$5\\$\) indicate relative costs](#)

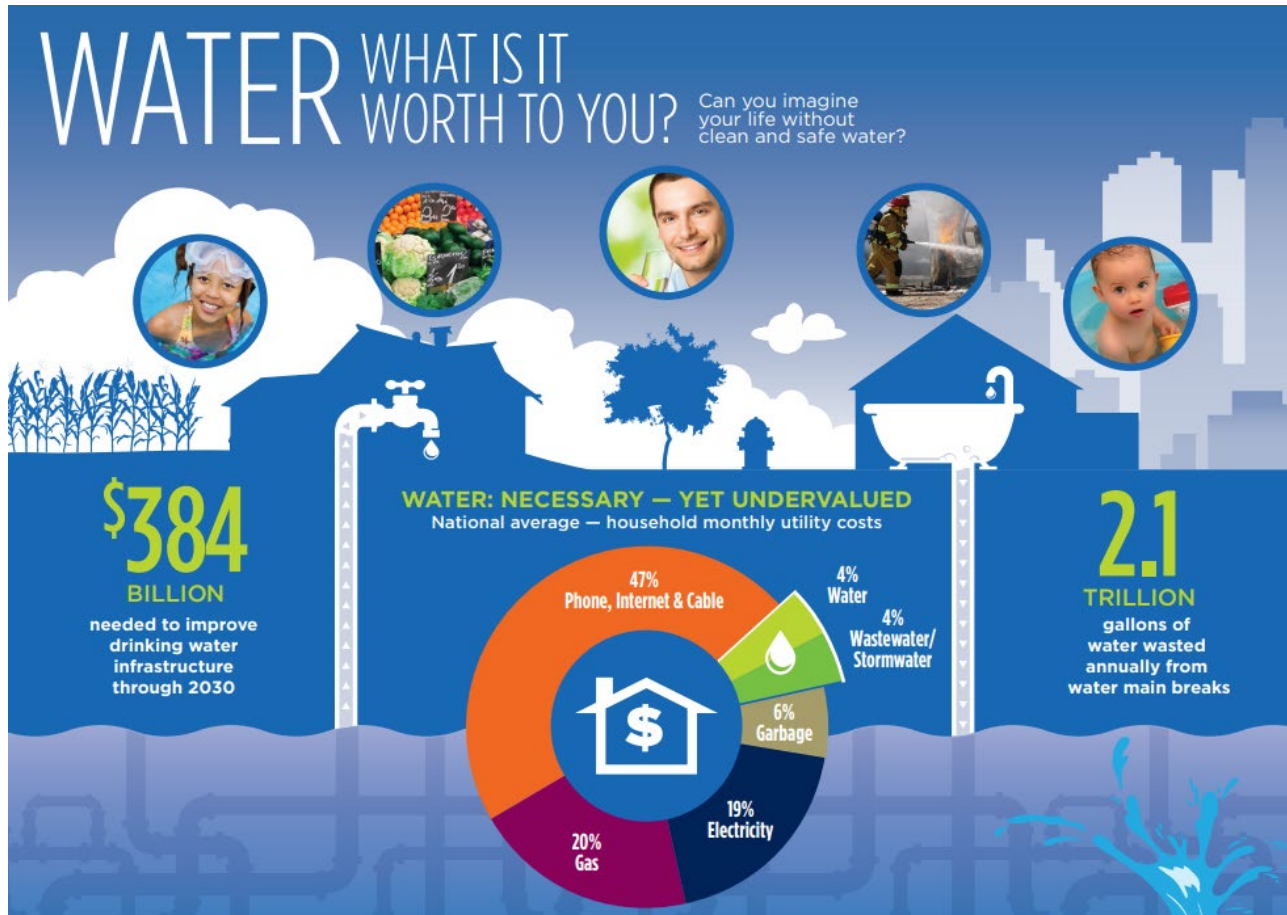
[Click name of any option to review more information in the Glossary](#)

ADAPTATION OPTIONS **No Regrets options** - actions that would provide benefits to the utility under current climate conditions as well as any future changes in climate. For more information on No Regrets options, see Page 11 in the Introduction.

[Click on the icon or icon to review the relevant Sustainability Brief.](#)

✓	PLANNING	COST
<input type="checkbox"/>	Integrate flood management and modeling into land use planning.	\$
<input checked="" type="checkbox"/>	Develop models to understand potential water quality changes (e.g., increased turbidity) and costs of resultant changes in treatment.	\$
<input type="checkbox"/>	Expand current resources by developing regional water connections to allow for water trading in times of service disruption or shortage.	\$\$-\$\$\$
<input type="checkbox"/>	Plan for alternative power supplies to support operations in case of loss of power.	\$
<input type="checkbox"/>	Adopt insurance mechanisms and other financial instruments, such as catastrophe bonds, to protect against financial losses associated with infrastructure losses.	\$
<input type="checkbox"/>	Conduct training for personnel in climate change impacts and adaptation.	\$
<input type="checkbox"/>	Ensure that emergency response plans deal with flooding contingencies and include stakeholder engagement and communication.	\$
<input type="checkbox"/>	Establish mutual aid agreements with neighboring utilities.	\$

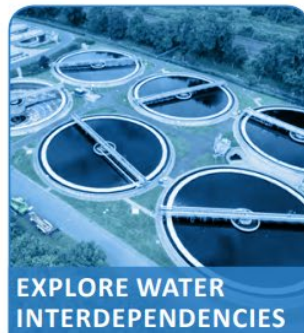
Water Utility Public Awareness Kit





COMMUNITY-BASED WATER RESILIENCY GUIDE

Select a menu option below. New users should start with Overview.



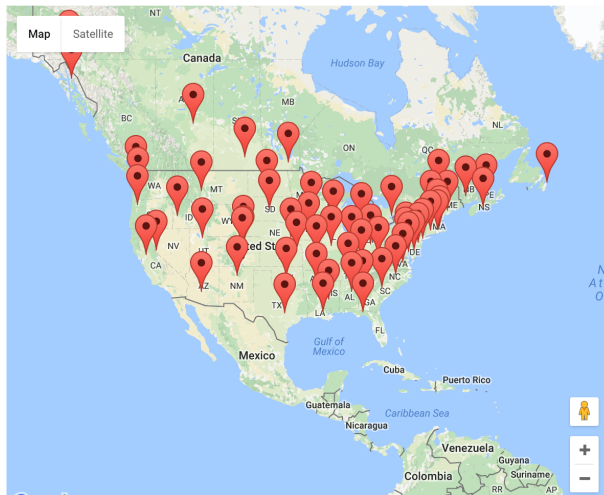
Information Sharing to Support Resilience

Water/Wastewater Agency Response Network (WARN)

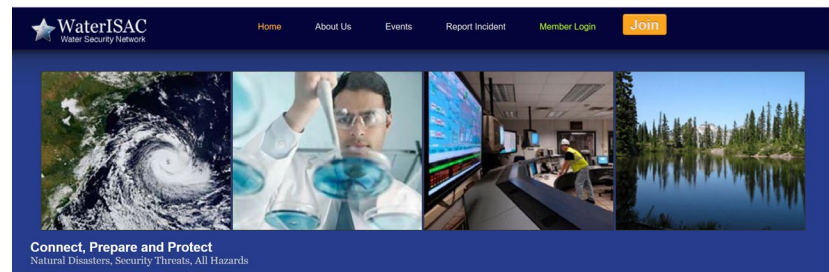


A Water and Wastewater Agency Response Network is a network of utilities helping other utilities to respond to and recover from emergencies. The purpose of a WARN is to provide a method whereby water/wastewater utilities that have sustained or anticipate damages from natural or human-caused incidents can provide and receive emergency aid and assistance in the form of personnel, equipment, materials and other associated services as necessary from other water/wastewater utilities.

Click a pin to view contact information for the local WARN representative, with a link to more information about that state and region. You can also view current [Situation Reports](#).



Water Information Sharing and Analysis Center (WaterISAC)



<https://www.waterisac.org/>

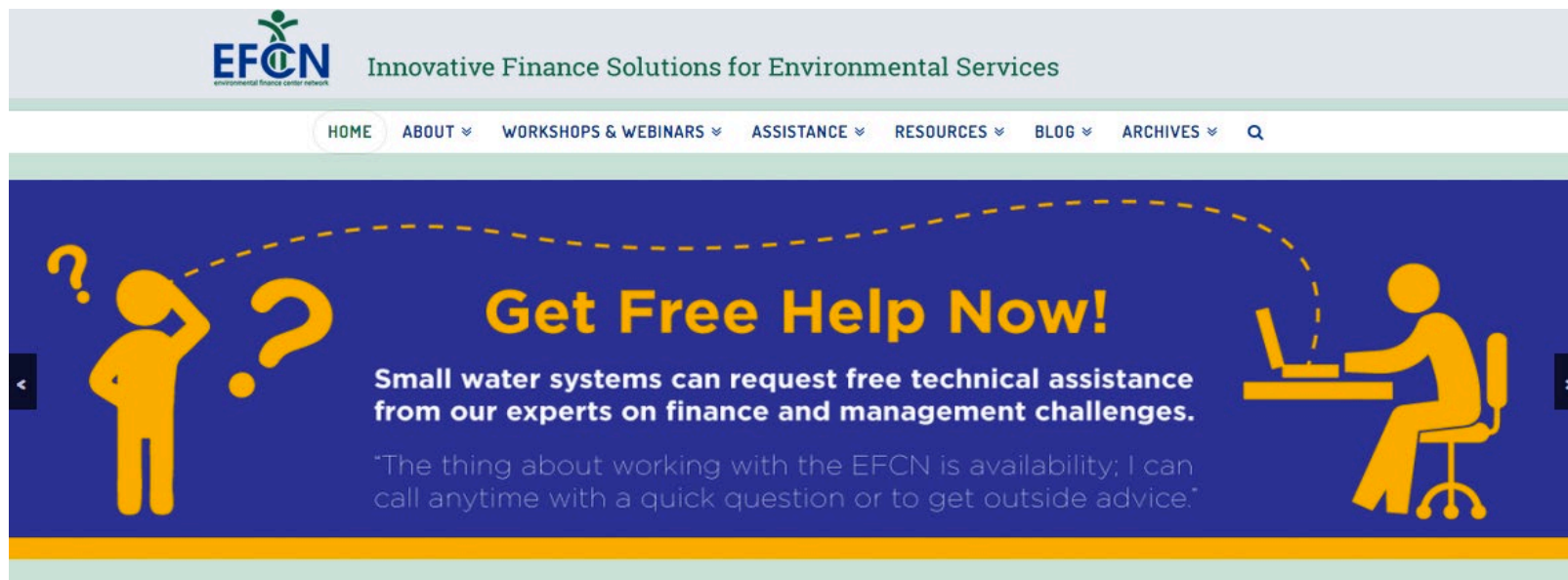
https://www.epa.gov/sites/production/files/2016-03/documents/150611_states_warns_flyer_final.pdf

<https://www.awwa.org/resources-tools/water-knowledge/emergency-preparedness/water-wastewater-agency-response-network.aspx>



Visit the EFCN Website – *www.efcnetwork.org*

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



The screenshot shows the EFCN website header with the logo and tagline "Innovative Finance Solutions for Environmental Services". Below the header is a navigation menu with links: HOME, ABOUT, WORKSHOPS & WEBINARS, ASSISTANCE, RESOURCES, BLOG, ARCHIVES, and a search icon. The main banner features a blue background with yellow text and graphics. On the left, a yellow stick figure stands with a question mark above its head. On the right, a yellow stick figure sits at a desk with a laptop. A dashed yellow line connects the two figures. The text in the center reads: "Get Free Help Now! Small water systems can request free technical assistance from our experts on finance and management challenges." Below this, a quote states: "The thing about working with the EFCN is availability; I can call anytime with a quick question or to get outside advice."

EFCN
environmental finance center network

Innovative Finance Solutions for Environmental Services

HOME ABOUT WORKSHOPS & WEBINARS ASSISTANCE RESOURCES BLOG ARCHIVES Q

Get Free Help Now!

Small water systems can request free technical assistance from our experts on finance and management challenges.

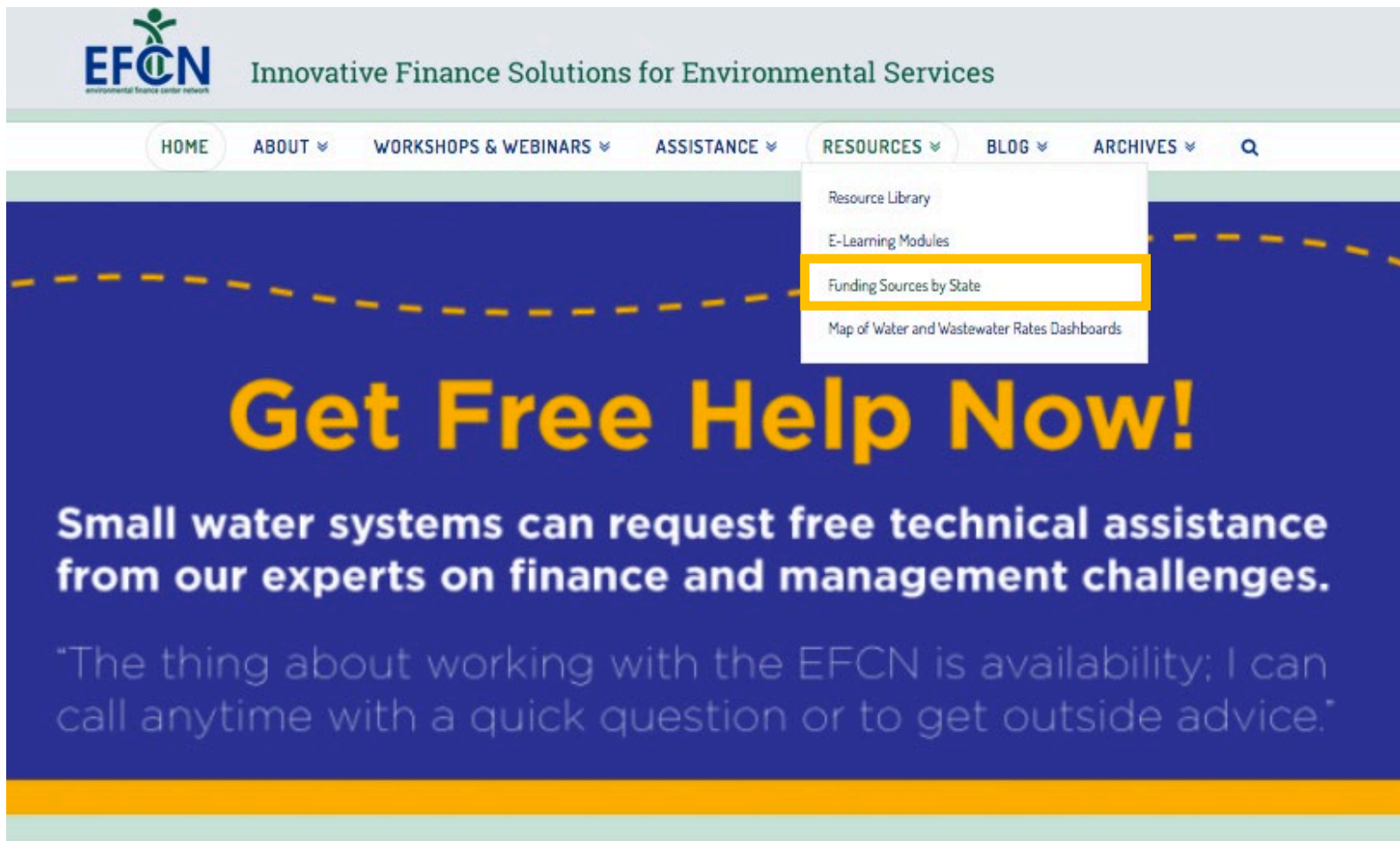
"The thing about working with the EFCN is availability; I can call anytime with a quick question or to get outside advice."





Funding Tables By State

Select “Funding Sources by State” under the Resources Tab.



The screenshot shows the EFCN (Environmental Finance Center Network) website. The header includes the EFCN logo and the tagline "Innovative Finance Solutions for Environmental Services". The navigation menu contains links for HOME, ABOUT, WORKSHOPS & WEBINARS, ASSISTANCE, RESOURCES, BLOG, and ARCHIVES. The RESOURCES dropdown menu is open, and the option "Funding Sources by State" is highlighted with a yellow box. Below the navigation bar, there is a large blue banner with the text "Get Free Help Now!" in yellow, followed by a white text box stating: "Small water systems can request free technical assistance from our experts on finance and management challenges." and a quote: "The thing about working with the EFCN is availability; I can call anytime with a quick question or to get outside advice."

EFCN Innovative Finance Solutions for Environmental Services
environmental finance center network

HOME ABOUT WORKSHOPS & WEBINARS ASSISTANCE **RESOURCES** BLOG ARCHIVES

- Resource Library
- E-Learning Modules
- Funding Sources by State**
- Map of Water and Wastewater Rates Dashboards

Get Free Help Now!

Small water systems can request free technical assistance from our experts on finance and management challenges.

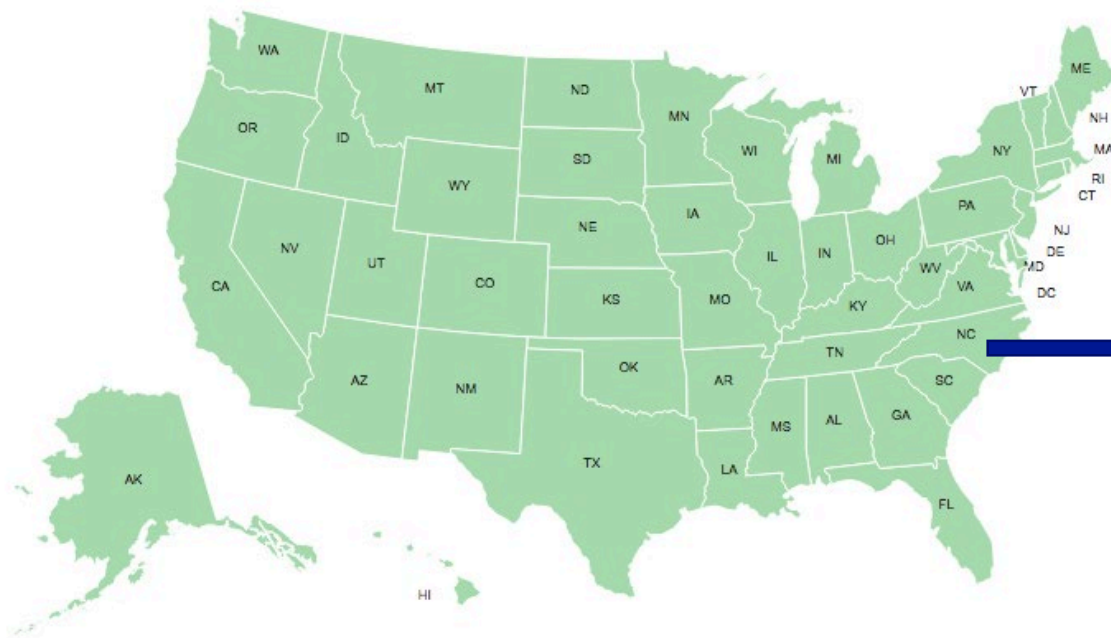
"The thing about working with the EFCN is availability; I can call anytime with a quick question or to get outside advice."



Funding Sources by State

Note: Some states may have additional resources listed below the map.

Click on the map below to view funding sources for each state:

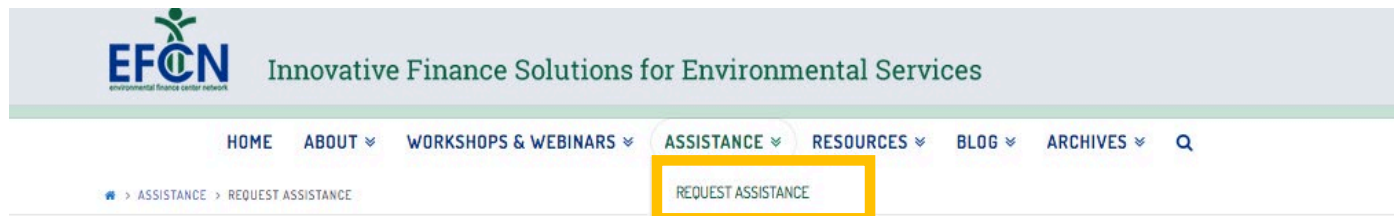


Click on an individual state to view funding table.

Oregon Water and Wastewater Funding Sources (updated by the EWU, March 2018)					
Organization	Program (if available)	Purpose or Use of Funds	Application Dates	Website	Contact
Oregon Health Division	Safe Drinking Water Monitoring and Assessment	Financial and public health resources to monitor water quality and health risks associated with drinking water. Includes funding for water quality monitoring, water safety planning, and water safety training.	For the Safe Drinking Water Act (SDWA) monitoring and assessment program, applications are accepted on a rolling basis. For the Safe Drinking Water Act (SDWA) monitoring and assessment program, applications are accepted on a rolling basis.	http://www.ohd.org/programs/sdwam/	John Hargrave Program Manager john.hargrave@ohd.state.or.us
Environmental Protection Agency	National Sanitation Foundation Grant	Financial and public health resources to monitor water quality and health risks associated with drinking water. Includes funding for water quality monitoring, water safety planning, and water safety training.	For the Safe Drinking Water Act (SDWA) monitoring and assessment program, applications are accepted on a rolling basis. For the Safe Drinking Water Act (SDWA) monitoring and assessment program, applications are accepted on a rolling basis.	http://www.epa.gov/sdwam/	John Hargrave Program Manager john.hargrave@epa.gov
	National Sanitation Foundation Grant	Financial and public health resources to monitor water quality and health risks associated with drinking water. Includes funding for water quality monitoring, water safety planning, and water safety training.	For the Safe Drinking Water Act (SDWA) monitoring and assessment program, applications are accepted on a rolling basis. For the Safe Drinking Water Act (SDWA) monitoring and assessment program, applications are accepted on a rolling basis.	http://www.epa.gov/sdwam/	John Hargrave Program Manager john.hargrave@epa.gov
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Oregon Department of Environmental Quality	Safe Drinking Water Monitoring and Assessment	Financial and public health resources to monitor water quality and health risks associated with drinking water. Includes funding for water quality monitoring, water safety planning, and water safety training.	For the Safe Drinking Water Act (SDWA) monitoring and assessment program, applications are accepted on a rolling basis. For the Safe Drinking Water Act (SDWA) monitoring and assessment program, applications are accepted on a rolling basis.	http://www.deq.state.or.us/sdwam/	John Hargrave Program Manager john.hargrave@deq.state.or.us
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Request Technical Assistance

Select “Request Assistance” under the Assistance Tab off the EFCN homepage to access and submit the TA request form electronically.



REQUEST ASSISTANCE

A screenshot of the "Technical Assistance Request Form" page. The page has a dark blue header with a banner image showing water treatment equipment. Below the header, the title "Technical Assistance Request Form" is displayed in green. The text explains that EFCN offers free help on financial and managerial topics to systems serving 10,000 or fewer people. A list of services is provided, including creating an asset management plan, near-term financial planning, analyzing revenues and expenses, budgeting, capital planning, energy/water loss assessment, identifying funding sources, collaborating with other systems, and resiliency planning. At the bottom, it states that interested parties should fill out the form below to help EFCN understand their water system and needs.

Technical Assistance Request Form

The EFCN offers free help on financial and managerial topics to systems serving 10,000 or fewer people. Examples of assistance we can provide include:

- Creating an Asset management plan
- Near-term financial planning and rate setting
- Analyzing your revenues and expenses
- Offering ideas on how to effectively budget
- Long-term capital planning
- Assessing options for lowering energy use and/or water loss
- Identifying sources of outside funding
- Collaborating with other water systems
- Resiliency Planning

If you are interested in requesting assistance from our experts, please fill out the form below. You will be asked a few questions to help us understand your water system and what kind of assistance you need.



Q&A

- Brandy Espinola
 - Program Manager, University of Maryland Environmental Finance Center
 - bespinol@umd.edu
 - 301.314.9491





Smart Management for
Small Water Systems

**Thank you for participating today.
We hope to see you at a future workshop!**

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