



## Resources to Assist Water Utilities with Resilience and Disaster Recovery

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The Environmental Finance Center at the University of North Carolina Chapel Hill (EFC at UNC) has created several free resources that are relevant to water utilities in addressing the challenges and questions related to resilience and disaster recovery. These resources cover a broad range of finance and management topics, including funding, disaster management, partnerships, green infrastructure, energy management, and rates and finances.

Access EFC at UNC tools at <http://www.efc.sog.unc.edu> (search for the tool name) and any of the available resources in the list below by clicking on the resource title.

Available resource types in this list include:



**Tools**



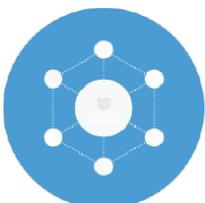
**Blog Posts**



**Publications**



**Past Workshop  
Materials**



**Response Network**

## Funding



### [Funding Matrices for all US States and Territories](#)

Use this interactive map tool to find funding sources for each state and territory. It provides the funding organization, the program, purpose of the funds, applications dates, contact information, and web links.



### [Four Ways Water Utilities Can Weather a Hurricane](#)

When hurricane season arrives, many communities battle unwanted effects. Many lose electric and water service. Utilities struggle to get their systems up and running. This blog post highlights how some utilities are more resilient in the face of natural disasters due to pre-disaster planning.

## Disaster Management



### [Risk Management: Lessons Learned During Disasters](#)

Understanding your utility's assets, insurance, FEMA and State's roles, responsibilities, and requirements are fundamental for pre and post disaster. This presentation from Douglasville-Douglas County Water and Sewer, GA based on experience from a flooding incident addresses topics utilities must be aware of both pre- and post disaster.



### [Sparking Sustainability and Innovation in North Carolina](#)

Local governments play a central role in creating and maintaining vibrant, healthy, and strong communities. This publication discusses sustainability in the broadest possible sense, based on the understanding that sustainable local governments are built by many elements of the unit working together interdependently. This creates the capacity for local governments to survive and thrive over the passage of time.



### [Local Government Financial Resilience and Preparation before a Natural Disaster](#)

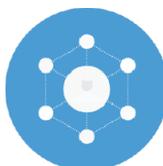
As a result of rapid urbanization, climate change, and population increase, municipalities are becoming extremely vulnerable to natural disasters. This blog post guides local governments on how to be financially resilient in the face of a natural disaster.



### [How Communities can Save Money on National Flood Insurance](#)

Looking at the history of legislation of the National Flood Insurance Program (NFIP), national flood insurance premiums are likely to increase in the coming years. However, this blog post discusses how communities can still use NFIP to their full advantage while bolstering against future price increases and preparing for flood disasters.

## Partnerships



### [Water and Wastewater Agency Response Network](#)

Water and Wastewater Agency Response Network (WARN) is a network of utilities helping other utilities to respond to and recover from emergencies. WARN provides a method whereby water and wastewater utilities that have sustained or anticipate damages from natural/human-caused incidents can provide and receive emergency aid and assistance.



### **Crafting Inter-Local Water Agreements**

This guidance document reviews tips relating to issues utility managers need to be aware of before and while entering into an agreement with another utility. Many of these tips apply to creating a water purchase agreement, whether for regular or emergency use.



### **The Potential for Management Partnerships between Small and Large Local Government Water Systems**

Small systems may benefit from the expertise, experience, and specialization of the managers and staff of larger local government systems. This report assesses the geographic feasibility of management partnerships in North Carolina, but has wider application.



### **Steering Innovation in Water Utility Finance and Management: A Water Research Foundation Leadership Forum**

The Water Research Foundation convened a workshop that discussed innovation in finance and management strategies in the industry around 10 predicted trends to assess their impact and discuss the risk associated with some of the more prevalent trends.

## **Green Infrastructure**



### **Methods and Strategies for Financing Green Infrastructure**

Opportunities to implement green infrastructure practices can arise after a natural disaster has damaged existing gray infrastructure. This report identifies key components of financing mechanisms available to support green infrastructure, including potential sources of capital and revenue. The document references Durham, North Carolina, and while some of the financing mechanisms are specific to state and local conditions, most of the ideas are applicable to communities beyond Durham.



### **Crosswalking between Gray and Green Infrastructure for Budget Officers**

This report aims to provide a budget officer, or watershed proponent who seeks to influence a budget officer, some tools for planning for certain key attributes of green infrastructure in the budget process.



### **Catalog of Green Infrastructure and Stormwater Finance Publications**

This tool is a tabled catalog of 46 publications on green infrastructure for stormwater management that have finance relevance. A user can filter and sort the table according to location, audience, as well as several other criteria.



### **Bottom-Up Financing Options for Green Infrastructure: What Will Your Approach Be?**

As many local governments are making strides in implementing green infrastructure installations, other local governments are still in pilot phase. As these installations become an accepted part of a local government's infrastructure investment portfolio, the inevitable "How to pay for it?" questions will arise. This blog post discusses financing options for green infrastructure.

## Energy Management



### [Ensuring a Sustainable Future: An Energy Management Guidebook for Wastewater and Water Utilities \(EPA\)](#)

Developed by the U.S. Environmental Protection Agency, the Guidebook will show a utility how to set, manage, and achieve energy efficiency goals through the development and implementation of a focused energy management program.



### [Water Batteries: With the Right Rate Structure, Water Utilities Can Back-Up the Electricity Grid](#)

This article, published in the Winter 2014 edition of *The Georgia Operator* discusses how water utilities across the country have an enormous potential to reduce peak load on the country's electricity grid and subsequently save quite a bit of money.

## Rates and Finances



### [Water Utility Revenue Risk Assessment Tool](#)

Use this tool to assess how much revenues might be affected by changing demand patterns. This tool will help compare effects on existing rates and on alternative rate structures.



### [Measuring and Mitigating Water Revenue Variability](#)

Many utilities are subject to factors that can affect revenue variability, including volatile weather patterns and a growing imperative to conserve scarce water resources. This report, in partnership with Ceres, examines real financial and water use data from utilities to demonstrate how rate structures can mitigate or intensify revenue variability.



### [Defining a Resilient Business Model for Water Utilities](#)

The EFC at UNC and the Water Research Foundation partnered to produce a report that helps utilities address the challenges of revenue gaps, which are exacerbated by rising customer expectations, declining water consumptions, aging infrastructure, and necessary integration of utility finance with asset management, environmental justice, and more.



### [Financial Health Checkup for Water Utilities](#)

Use this tool to get a snapshot of your utility's financial health and demonstrate the financial strengths and weaknesses of your utility over the past 5 years. The tool uses your utility's financial data to calculate and visualize 6 financial performance indicators.



### [Plan to Pay: Scenarios to Fund Your Capital Improvement Plan](#)

Use this tool to project your fund balance (revenues, expenses, and reserves), and necessary rate increases for the next 20 years, and more. Data entry requirements are minimal. Intended for small and medium systems.



## **Water and Wastewater Rates Analysis Model**

Use this tool to project your water utility fund balance for the next 20 years under existing rates versus proposed new rates. Uniform and block rate structures for both residential and non-residential customers can be assessed. Designed for small water systems.