Water Utility Resilience Readiness Tool

Updated May 2025

Overview:

U.S. EPA has developed many resources to assist water and wastewater utilities with preparation for dealing with risks to drinking water service continuity. Achieving such resilience is more than a matter of natural hazards and sudden emergencies alone.

This resource tool gives you:

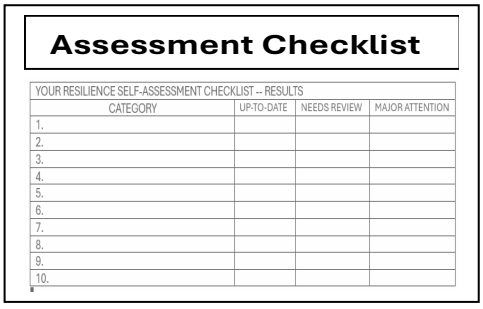
1. A quick overview of all the different aspects of resilience; Resilience means business!
2. A checklist to "map" out any areas where your utility may want to assess and improve readiness for specific functions and topics;
3. A few initial suggestions of free training and assistance, including the Small Water Utility assistance available from the Environmental Finance Centers Network (EFCN) sponsored by USEPA; Many resources come from several EPA offices and programs within the Office of Water and other units, including the Water Infrastructure and Cyber Resilience Division, The Creating Resilient Water Utilities Program, and the Office of Research and Development.

Resilience: The ability to return to normal function after a disruption—or as utilities know, to continue vital public services with little or no delay.

Using this Tool:

This tool only asks a few key questions about your current preparation for and attention to each area of resilience. You make a preliminary judgment about whether the area needs a minor check-up or much greater attention. This is just a quick starting point and you and likely others at your utility will need to further look into your situation for each area you flag for attention. The idea is to get an agenda or initial punch-list. Initial resource links are given, when possible, where you can find information about best practices and needs, to help with your effort.

CASE EXAMPLE: For example, in the cybersecurity area, if you have some preparations, but not based on current knowledge, an update check may be needed. If your utility has given little or no attention to cyber threat preparation, then training and/or technical assistance is needed now. A VERY minimal level of resilience preparation would be staff trained not to click on any suspicious posts or attachments. But what if you DO have an incident? Is there a response procedure? Who would you contact for help? Are any of your critical data files such as customer records (or worse, operational control system hardware or software) open to the internet? Do you have an inventory of all your digital resources and know which may be vulnerable? This would be your initial quick-assessment.



There are several ways to seek follow-up help:

- Self-help planning and information tools from USEPA, especially in vulnerability assessment, emergency planning, cybersecurity, and climate adaptation;
- Selected free technical assistance from USEPA in certain areas.
- Free training and technical assistance from the Environmental Finance Centers Network's Small Water Systems Program through 2026; Especially applies to hazards,

cybersecurity, general financial resilience for O&M and capital, and community-based water resilience, as well as selected operations technical areas.
- Your Rural Water Association and/or Rural Community Assistance Program (RCAP);
- Non-traditional partners such as your regional economic development district or council of governments for topics such as workforce development.

Emergency Management is the beginning point, as you see in the center of the graphic shown, but developing resilience happens before and after any incident as an ongoing business practice in all the areas surrounding that, as shown.

This quick resilience assessment covers the following:

1. Vulnerability Assessment
2. Emergency Response Planning and Basic Mutual Aid
3. Climate Planning—Adaptation
4. Critical Operating—Plant Resilience
5. Workforce Operating Resilience
6. Cybersecurity Risk Reduction and Incident Response
7. Financial Resilience—Emergency
8. Financial Resilience—Long-Term
9. Community-Based Water Resilience—Beyond Mutual Aid

#1. Vulnerability Assessment

Explanation and Rationale

AWIA—the American Water Infrastructure Act of 2018, requires risk and resiliency assessments and Emergency Response Plans (ERPs) by utilities serving more than 3300 persons. USEPA provides several tools for making assessments of both natural hazards and malevolent human act threats including cybersecurity threats. The online-only Vulnerability Self-Assessment Tool (VSAT) is appropriate for any utility, but a pencil-and-paper small utility vulnerability checklist is very adequate for smaller utilities and also those rural utilities not required under AWIA.

Key Questions for Your Assessment**

Have you recently identified your threats to service continuity—physical and human? If you have not recently identified them, do you have a previous assessment you can review and update? If not assessed, consider beginning a vulnerability assessment now. Consider that insurers, as well as liability claimants, are increasingly looking for this evidence of basic due diligence.

***Key questions in this quick assessment are not exhaustive, only a starting point and suggestive, to help you judge if you need to follow-up.*

Action Resources

Limited training guidance is available from EPA for VSAT, but there is online guidance as well as access to the tool at: https://www.epa.gov/waterresilience/vulnerability-self-assessment-tool-conduct-drinking-water-or-wastewater-utility

The Small System Risk and Resilience Assessment Checklist is available at:

https://www.epa.gov/waterresilience/small-system-risk-and-resilience-assessment-checklist

The online Vulnerability Self-Assessment Tool can be found at:

https://vsat.epa.gov/vsat/

EPA also provides a Resilient Strategies Guide (RSG) that ties specific threats to risk-reduction actions, and this can help you understand what threats should be considered. The RSG is included under climate planning resources in section 3.

The EFC Network can also provide training and technical assistance for small systems.

#2. Emergency Response Planning—ERP—and Basic Mutual Aid

Explanation and Rationale

AWIA requires Emergency Response Plans (ERPs) by utilities serving more than 3300 people. USEPA provides multiple tools and templates for developing the ERP as well as for aiding in emergency response, such as incident-specific SOP checklists. Plans are to be updated every five years for utilities serving more than 3300 people, but all utilities need such preparations. Also vital is that emergency planning today (and under AWIA) includes readiness to deal with human-caused threats, especially cyber attacks. Effective emergency preparedness also includes arrangements for mutual aid. This includes with neighboring water utilities for personnel and equipment and in some cases interoperability, and participation in your state's WARN network—the Water/Wastewater Agency Response Network. Later in this tool, mutual aid from other kinds of community arrangements is discussed. Finally, certification deadlines for updates under AWIA begin in 2025 for large utilities and in 2026 for small utilities. See: https://www.epa.gov/ground-water-and-drinking-water/americas-water-infrastructure-act-2018-awia

Key Questions for Your Assessment

Do you have an ERP? Have you reviewed your ERP in the last few years with staff? With your governing body for due diligence? Does your ERP preparedness cover new or heightened hazards you may have experienced more recently? Do you have mutual aid agreements? Do you participate in WARN? Have all staff participated in exercises or other work to keep emergency procedures

effective? As with any of these resiliency indicators, there are further layers to think about, beyond this overall scan. As an example, and one that has been important to other utilities in a disruption, are your administrative and office staff prepared to provide important support services that will be important to the speedier resumption of service?

Action Resources

USEPA provides incident checklists for a wide range of natural hazards, operational incidents such as algal blooms in source water, and cybersecurity. These checklists themselves are a good review of what preparation you may need:

https://www.epa.gov/waterutilityresponse/incident-action-checklists-water-utilities

Some years ago, USEPA developed an online "Route to Resilience" tool. The R2R tool takes a system step-by-step through developing preparations to respond to operational emergencies. For example, one section reviews recommended steps to make sure you have access to testing if your normal resource is disabled. Basic and more detailed action steps are presented for each topic. The R2R tool helps review what emergency-phase preparations may need to pay more attention.

https://rtor.epa.gov/

Every water utility should make sure they have developed contact with their county level emergency management agency (EMA) and that your ERP is integrated into your area's emergency operations plan. The local EMA is a vital partner in areawide emergencies and disasters during and after immediate response, and for pursuing disaster financial assistance.

The Environmental Finance Center Network (EFCN) Small System TMF Program can assist with reviewing these options and developing an action work plan.

#3. Climate Planning -- Adaptation

Explanation and Rationale

Traditionally emergency planning has focused on looking back at known and experienced hazards. But changing natural conditions demand new efforts to look ahead at how impacts may grow in size, location, and behavior. Altered preparations may be needed. New impacts affect not only water systems, but also stormwater management, areawide fire hazards, and other infrastructure water and wastewater systems rely on.

Climate information is needed for the added vulnerability analysis needed to look at trends in future conditions of temperature, precipitation and storm behavior. This helps create an alertness to more intense or even formerly unseen conditions that may occur. That is the basis for any new preparedness or hazard reduction actions. Action on emerging, future conditions is called adaptation.

What does this mean in practice? For example, systems in some regions with warmer and wetter trends are already experiencing new flooding of infrastructure where it had been none or a seasonal nuisance, both on coasts and inland. Elsewhere, wildfire patterns have grown where rainfall has become more variable. Changes in temperature in some cases are affecting source water stream-flows and water chemistry, affecting source needs for filtration and other treatment adjustments.

Key Questions

Has your water system used any information on regional climate trends to identify new or changing vulnerabilities? Are climate considerations part of your Risk and Resilience Assessment and Emergency Response Plan? Have you acknowledged attention to climate planning at the governing body level for recognition by insurers and capital fund sources? Is your system developing a climate adaptation strategy or plan? These are just the beginning questions to ask.

Action Resources

USEPA has developed substantial resources to assist the water sector with climate information for resilience management. A good starting place is to look are the resources available from EPA's Creating Resilient Water Utilities (CRWU) program. Basic climate trend maps and information are available CRWU helps put your general future risk situation in perspective. A Resilient Strategies Guide (RSG) provides a programmed tool for identifying threats, possible risk reduction actions and an introductory level look at possible costs, benefits, and funding options. A more extensive tool with a focus on costs is called CREAT, the Climate Resilience Evaluation and Awareness Tool. Starting with basic climate trends, CREAT carries the user through risk identification and risk reduction action to a strategy-specific cost-benefit analysis providing information on whether the action is likely to pay off with loss-avoidance in the future. The CREAT tool requires some training and EPA's CRWU unit has also been able to provide direct technical assistance using it for a limited number of systems each year.

Information on all of the CRWU resources is available at:

https://www.epa.gov/crwu

A companion document from EFCN, "Tools for Utility Risk and Resilience Planning:
A Guided Inventory" contains further links to resources. See:
https://efcnetwork.org/tools-publications/tools-for-utility-risk-and-resilience-planning-a-guided-inventory/

#4. Critical Operating/Plant Resilience

Explanation and Rationale

Water and wastewater utilities strive to be prepared to maintain services in the face of operational problems or external impacts. Each system must identify where their operational and plant vulnerable points may exist, but a few are fundamental to any system. These key questions are a good starting point on plant resilience:

Key Questions

There are many different physical plant and operations features and functions that merit preparatory attention, and there are different solutions depending on specific situations. Critical parts and equipment will vary, but does your system have provisions for them? Two critical benchmarks for drinking water resilience are emergency power and meeting minimum daily demand (MDD). Do you have robust provisions for at least 24 hours of backup electrical power and ability to meet your minimum daily demand for at least 24 and desirably 72 hours in the face of disruptions you may expect in your situation? Thinking more broadly, do you engage in asset management, a key tool for monitoring and acting on plant and operational vulnerabilities and maintenance?

Resources

The Environmental Finance Center Network's Small Systems TMF program can provide free training and some technical assistance in asset management and selected technical process subjects (e.g., multiple barrier strategies, nutrient removal improvement, etc.). A list of all topics is at:

https://efcnetwork.org/get-help/

Your state water resources and/or state health agencies as well as RCAP and RWA are also sources of technical support. Interconnection opportunities continue to be an often-sought short-term response and innovative alternatives, like mobile water treatment and supply with Water-on-Wheels carts, have emerged.

#5. Workforce Operating Resilience

Explanation/Rationale and Key Questions (Combined)

An industry strategy and standard for resilience is cross-training (XT) of enough personnel to provide critical backups in the face of emergencies, illness (such as from a pandemic) and other disruptions. Each system must decide where XT opportunities are possible. Limited staff and resources are a challenge. In fact, among small and rural systems in many states, succession due to retirements in the experienced and long-term workforce is a major issue. Consider what your shorter-term and long-term actions are. Have you:

(Short-term): Cross-trained personnel for the most critical operations? Arranged mutual aid with nearby systems to backstop short-term personnel needs?

(Long-term): Connected with workforce development programs at your regional planning/economic development district, or council of governments, and/or with community college and high school programs through the Future Water Leaders program, to "fill the pipeline" with potential operating staff?

Action Resources

Workforce development training is available from the EFCN Small Water Systems program as well as technical assistance, and also may be available from the Rural Water Association in some states. Non-traditional approaches to workforce needs may be available from your regional economic development district (EDDs) or council of government s (COGs). Regional organizations often work with programs and partners, such as community colleges, which can create opportunities for growing the pipeline for your workforce.

#6. Cybersecurity-Risk Reduction and Incident Response

Explanation and Rationale

Even some of the most rural and small water utilities around the nation have now been subjected to cyber attacks such as ransomware-based denials of service and hacking. Not only is this a hassle for anyone, but for water utilities it could threaten health and life. It is not just a big water system problem. To be resilient, every water utility should take steps to both prevent and prepare to act in response to such cyber threats.

Key Questions:

Has your system adopted any best practices for cybersecurity? That can include procedures every employee with digital access should follow; providing training for employees as well as conducting table exercise rehearsals for how to respond cyber threats; identifying and securing any interconnection vulnerabilities (especially if your system uses SCADA-controls) and creating backups for critical records if digital access is lost to an incident. Asset management, a best practice for any size water system, can also include the vital assessment of all digital resources you use, and the crucial internal and external connections involved.

Action Resources

The EFCN Small Systems TMF program, along with partner Government Finance Officers Association (GFOA) can assist with basic information and education to improve cybersecurity. The USEPA Water Infrastructure and Cyber Resilience Division (WICRD) provides training and technical assistance and can assist with access to other federal resources such as the Cybersecurity and Infrastructure Security Agency (CISA). Other private and nonprofit organizations include WaterISAC and the Water Security Alliance.

#7. Financial Resilience—Emergency

Explanation and Rationale

An extensive set of best practices for preparation and response to short-term emergency disruptions of your utility's financial operations is included in the NIMS/ICS national incident management system framework. Each is a common-sense step to protect resilience in your supply chains with vendors and payroll operations. The aim is to avoid an inability to make payments just when time is of the essence and support of your personnel is essential. Waiting until the disruption is too late to prepare.

Key Questions

As a first assessment, do you have procedures and provisions to rapidly make expenditures in a disruption? Are necessary emergency contracts in place for use? Are critical records backed up? Can you maintain a payroll on a short-term emergency basis? Do you have any reserve funds available for short-term emergencies?

Action Resources

USEPA provides useful information on best practices,. Start with this site:

https://www.epa.gov/fedfunds/prepare-funding-maintain-your-water-or-wastewater-utilitys-financial-business-operations

The EFCN Small Water Systems TMF program can assist with reviewing financial health in general and as it relates to emergency needs, as well providing education on financial emergency preparedness.

It is vital to recognize that cybersecurity preparedness is part of financial resilience.

#8. Financial Resilience—Long-Term

Explanation and Rationale

All drinking water systems should build long-term financial resilience by setting rates that support operating, maintenance and longer-term investment needs. Most water systems will need capital funds at some point in a long life to improve or expand infrastructure. Both aspects are part of long-term resilience. On the capital side, one new trend is that bond funders and raters, as well as insurers, are now looking at whether a system has paid attention to the multiple aspects of resilience including those covered in #1-7 here. Rating agencies for bonds will pay attention to whether plans and procedures appear in place for vulnerabilities from natural hazards to cybersecurity. Some will look for evidence of management or governing body commitments, such as annual attention reflected in board minutes. All of this can make a difference to having the funds needed. Scrutiny by insurers is even more likely.

Key Questions

Rate studies to maintain sustainable revenues for both O&M and future capital needs are the oldest assistance provided by the Environmental Finance Centers. Today, when seeking bond funding, rating agencies are as noted above paying more attention to all aspects of resilience. Providing visible evidence of investment in resilience can materially improve ratings and hence financial capacity for capital investment as well as support insurance access.

#9. Community-Based Water Resilience—Beyond Mutual Aid

Explanation and Rationale

The water sector is paying more attention to "Community-Based Water Resiliency" (CBWR). Every water utility should have mutual aid agreements with emergency response resources appropriate to their needs. This is readily accomplished by joining their state WARN (Water and Wastewater Agency Response Network), which is free in almost all states. In some states, WARN membership will also facilitate access to assistance in federally declared disaster events. Increasingly complex and multi-faceted hazards and risks have led to recognition that a water utility needs to go "beyond the billing relationship" and beyond traditional incident-focused mutual aid arrangements to engage both those that depend on them in the community (e.g., customers and institutions like hospitals) and those they depend on for critical resources (e.g., electric power providers, key vendors, and other public agencies) on a regular basis.

Interdependency is the vital idea when it comes to Community-Based Water Resiliency. One example is how safe drinking water utilities must engage cooperation from their customers to manage demand during both short-term supply shortfalls and extended ones due to drought or other impacts. More than just one-way communication, this requires an ongoing relationship that cannot be created overnight. Some utilities have begun to meet annually with key community organizations as well as providers or vendors the utility itself will depend on for help in some situations. This can build understanding and robust lines of communication.

Key Questions

Consider how you connect with community partners for communications to water users and key facilities; with emergency response partners for mounting short-term alternative water supply and distribution efforts; and with partners your own system must depend on (power, manpower, supply vendors).

Action Resources

A good starting point is USEPA's a Community-Based Water Resiliency Guidebook. The EFCN Small Water project can assist with holding the recommended community workshop in some cases.

Next Steps:

In conclusion, you can use the checklist in the table below to make a quick, beginning selfp-assessment of follow-up needs. Whether started by one available and knowledgeable staff members or done with several from the start, it is important to review these needs with staff from all functional areas at your system including office and administrative and management and boards.

Check Your Own System's Resilience Readiness & Plan to Follow-Up

YOUR RESILIENCE SELF-ASSESSMENT CHECKLIST -- RESULTS			
CATEGORY	UP-TO-DATE	NEEDS REVIEW	NEEDS MAJOR ATTENTION
1. Vulnerability Assessment			
2. Emergency Response Planning			
3. Climate Planning—Adaptation			
4. Critical Operating—Plant			
5. Workforce Operating Resilience			
6. Cybersecurity			
7. Financial Resilience—Emergency			
8. Financial Resilience—Long Term			
9. Community-Based Water Resilience			