

Congratulations and Welcome

EI would like to recognize the following employees for their milestone anniversaries with the company:

5 Yrs: **Brandon Stahl, E.I.**
Project Engineer

15 Yrs: **Stephen Dennison, P.E.**
Senior Project Manager

EI would like to congratulate **Chris Ott, P.E., CPII** and **Chris Walton, P.E.** on being promoted to Senior Project Engineer II.

Welcome to our newest employees in our Municipal and Environmental Groups:

- **Doug Keppy, P.E.**
- **Kamelia Afshinnia, Ph.D., E.I.**
- **Brandon Kramer**
- **Ali Ghassemi, Ph.D., E.I.**



The Challenge of Improving Resilience

*Outstanding Service
Every Client
Every Day*

Have you sensed an increase in the number of natural “disasters” lately? If you have, you are not alone. And, you are correct. There are more natural disasters occurring these days. Not only are there more, but they are more severe as well. According to the National Oceanic and Atmospheric Association (NOAA), there has been about a fivefold increase in the number of billion-dollar disasters (CPI-adjusted) over the last 40 years (see graph). Most of these disasters are categorized as severe storms, which includes high winds, hail and tornados. Geographically, Illinois ranks second. Texas is first. (Source: <https://www.ncdc.noaa.gov/billions/mapping>)

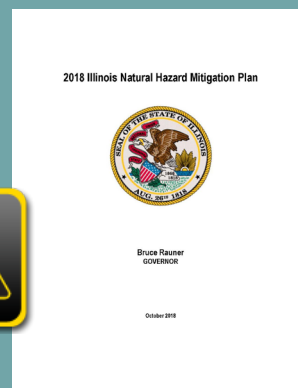
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Did You Know?

The hazards most likely to affect the State of Illinois are floods, severe storms, winter storms, drought, earthquakes and hazardous materials.

For more information related to the above topics visit:

www2.illinois.gov/iema/mitigation/pages/hazardinfo.aspx



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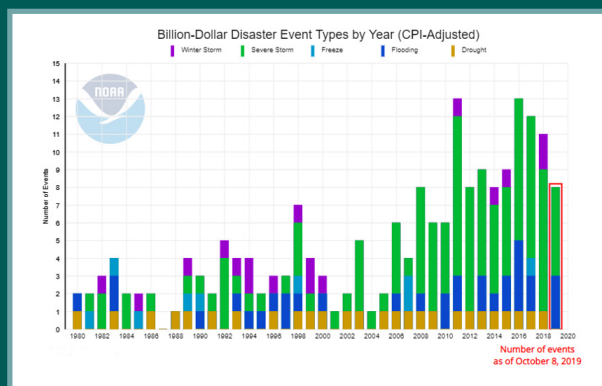
Did You Know?

Enterprises Trivia Challenge

Enterprises Trivia Challenge

Q: According to the Illinois List of Water Systems in SDWIS how many communities with a population of 3,301-49,999 will need to complete an RRA by June 30, 2021?

Send your answer to eei@eeiweb.com by February 28th to be entered in a drawing for a \$50 gift card!



Engineering Enterprises, Inc. (EEI), founded in 1974, is an award-winning consulting engineering firm providing services throughout northeastern Illinois. Our expertise includes water, wastewater, transportation, stormwater, construction management, land surveying, GIS and municipal consulting.

www.eeiweb.com

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Enterprises



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The Challenge of Improving Resilience, Cont'd.

The increase in number and severity of natural disasters is one of the reasons that National Infrastructure Advisory Council (NIAC) identified Severe Weather as one of three high-priority risks in its "Water Sector Resilience Final Report" (2016). You are most likely familiar with the other two high-priority risks, Aging Infrastructure and Cyber Dependency.

The NIAC report also concludes that "other critical sector services degrade quickly without a functioning water sector." This reliance on water is not news to us in the industry. What may be news, however, is the converse, that the water sector is reliant on other lifeline services such as chemical, energy, communications, and transportation sectors. This dependence upon critical service sectors represents another major risk to water utilities.

The need to address the risks described above was one of the primary drivers for Congress to pass the American Water Infrastructure Act (AWIA) of 2018, which is arguable the most significant amendment of the Safe Drinking Water Act since 1996. Thus, one of the most important objectives of AWIA is to improve the resilience⁽¹⁾ of our nation's water infrastructure. This portion of the regulation is an update and expansion of the Vulnerability Assessment and Emergency Response Plan requirements of the Bioterrorism Act of 2003. Whereas, the Bioterrorism Act sought to improve the security of water system relative to man-made hazards (terrorism), the new regulations require "all-hazards" be considered. This approach broadens the

(1) AWIA defines Resilience as "the ability of a community water system or an asset of a community water system to adapt to or withstand the effects of a malevolent act or natural hazard without interruption to the asset's or systems' function, or if the function is interrupted, to rapidly return to a normal operating condition." Natural hazard means "a natural event that threatens the functioning of a community water system, including an earthquake, tornado, flood, hurricane, wildfire, and hydrologic changes."

regulations requirement "all-hazards", be considered. This approach broadens the regulation to include natural disasters, cyber security, dependencies, and other hazards.

AWIA specifies two primary activities designed to reduce risk and increase resilience - the Risk and Resilience Assessment (RRA) and the Emergency Response Plan (ERP). All Community Water Systems serving populations of more than 3,300 must undertake these activities as specified by the regulation according to the schedule shown.

Population served	Population served	Population served
≥100,000	50,000-99,999	3,301-49,999
March 31, 2020	December 31, 2020	June 30, 2021
Emergency Response Plans		
- Certify ERP not later than 6 months after completion of the Risk and Resilience Assessment		

Undoubtedly, improving our ability to withstand and recover from a disaster (i.e. improving resilience) is a good thing. But, how exactly are we going to accomplish this goal and how much is it going to cost? The answer to the first part of the question is not straight forward. The regulation is very broad and non-specific, which is a bit of a double-edge sword. It is favorable in that there is flexibility to customize the approach to meet the needs of a particular water system. However, it is unfavorable because it does not provide a clear path to what is required for improving resilience. A little research on the topic of water infrastructure resilience reveals why the regulation may not be specific. The idea of infrastructure resilience is relatively new. In the United States, most of the research on water infrastructure resilience is less than 10 years old. Needless to say, the idea of improving resilience is even newer.

Fortunately, AWWA has developed a consensus standard (ANSI/AWWA J-100-10(R13)) that provides guidance for conducting an RRA. The document is entitled "Risk and Resilience Management of Water and Wastewater Systems". Note that the title of this standard includes wastewater. Interestingly, the USEPA is currently working on regulations like those found in AWIA, but for the wastewater industry. In addition, AWWA has developed a 10-hour training curriculum for meeting the requirements of AWIA. The training includes a review of Security Practices, Cyber security, and Emergency Response Planning.

The J-100 AWWA standard describes a seven-step process that can be used to identify and prioritize select hazard mitigation measures that will result in the greatest benefit/cost ratios for reducing risks and improving the resilience of a water/wastewater system. The seven-step process is commonly referred to as the RAMCAP (Risk Analysis and Management for Critical Asset Protection) Plus method. The outputs of the RAMCAP Plus method do not directly correspond to the items required by AWIA. Therefore, the method must be modified to address these requirements. The topics not directly addressed by RAMCAP but required by AWIA include financial infrastructure; monitoring practices; use, storage and handling of chemicals; and operation and maintenance practices. The output of the RAMCAP Plus method is a plan with specific actions and investments aimed at reducing credible risks to critical assets and improving the resilience of those assets.

Now, to the second part of the question - how much will it cost? The answer here is also not straight forward. Because there are a number of variables that influence the cost, the choices made concerning those variables ultimately determines the cost.

These variables include the:

1. Level of involvement by the utility versus outside help,
2. Number, type and level of involvement of stakeholders groups,
3. Size and complexity of the utility assets and supporting infrastructure,
4. Number and history of real and perceived threats

In some instances a utility may be inclined to perform the RRA using internal resources only. In this case, the lead (champion) for the effort will likely spend 25 to 50% of their time over a six-month period (250 to 500 hours) learning the regulation, preparing for and documenting meetings, organizing, and completing documentation of the RRA. The exact level of effort will depend on the factors listed above. The effort to develop an ERP will be less intense, but, will still require up to 10 to 25% of the lead person's time over a six-month period. It is important to recognize that other staff should participate in both the RRA and ERP. Stakeholders outside the utility also need to be involved including information technology, finance, public safety department, and a representative of the County Local Emergency Planning Committee.

Going outside of your utility for assistance may require adding a line item to the upcoming budget. For budgeting purposes, most utilities should plan on spending \$50,000 to \$100,000 for consulting fees. That range can be narrowed by defining the scope of the program that the utility desires. EEI has developed a scoping questionnaire that helps us define the utility's preferences and expectations for the program. That information is used to provide a customized proposal for the utility. Please contact **Tim Holdeman at tholdeman@eeiweb.com** to discuss your utilities needs.

President's Message



Peter G. Wallers, P.E., CFM

Risk and Resilience

I recently participated in an advisory board meeting for the Illinois State Water Survey (ISWS).

While we covered many areas much of our focus was on water supply planning and the challenges faced across the State. The discussion quickly led to the topic of climate change.

Much of what we use to predict the future is based on the past. In January a new version of Bulletin 70 will go from provisional to final. Rainfall amounts for the 24-hour 100-year design storm increased 13% over the previous version of Bulletin 70. This revision is based on a statistical review of past data, from 1948 to 2017.

In 2015, ISWS issued a report for the Urban Flooding Awareness Act. The report indicated that over a 10-year period, IDNR documented \$2.3 billion dollars in damages. \$1.6 billion dollars in damages resulted from five major storms. More than 90% of these damages occurred in areas outside the mapped 100-year floodplain.

Risk and Resilience analysis and assessment has never been more needed. Past predictive models are becoming outdated quickly and reliable climate models are years away.

All of us have now witnessed storms that exceeded past designs and I am no longer surprised when residents and elected officials express frustration over having multiple 100-year storms in the same season.

We are at the point when it is not if disaster will hit, but when. The public, while sympathetic to extreme weather, just wants to know when services and facilities will be back on-line.

Often Federal mandates don't coincide with what Utilities need to focus on and are often just unfunded mandates. Risk and Resilience plans may be unfunded, but the reality is that they will prove to be an essential tool.

After a disaster you will be asked to do the impossible. A Risk and Resilience Plan will give you the tools to deliver on the impossible!

