



# **Managing Climate Hazards and Improving Utility Resilience: Lessons Learned and EPA Tools**

Curt Baranowski

U.S. Environmental Protection Agency  
Office of Ground Water and Drinking Water  
Creating Resilient Water Utilities (CRWU) Initiative

# Speakers

- Presentations from:
  - **Michael Ruppel**, South Monmouth Regional Sewerage Authority and **Rina Dalal**, T&M Associates
  - **Andy Kricun**, Camden County Municipal Utilities Authority
- Brief Q&A with each panelist
- Discussion with all presenters

# Resilience Building Process



# CREAT Overview

- Web-based tool for conducting **risk assessment** of potential impacts at your utility
- Multiple scenarios provided to help **capture uncertainty**
- Assessments will help inform **planning**
- Results from CREAT help utilities compare **risk reduction and implementation costs**

# CREAT – Getting Started & Scenarios to Consider



## CLIMATE AWARENESS

Provide basic utility information  
Increase awareness of climate impacts

- Which utility **type and size** best describes your system?
- Which **current concerns** are important to your system?



## SCENARIO DEVELOPMENT

Understand utility risk  
Design scenarios of threats based on climate data

- Which **threats**, related to current and future concerns, should be assessed first?
- Would a specific set of **climate conditions** be critical to defining these threats?

# CREAT – Critical Assets & Plans to Protect Them



## CONSEQUENCES & ASSETS

Outline potential consequences  
Catalog critical assets

- Which types of **consequences** represent the value of assets to your utility and community?
- Which **assets** are both critical and vulnerable to threats being assessed?

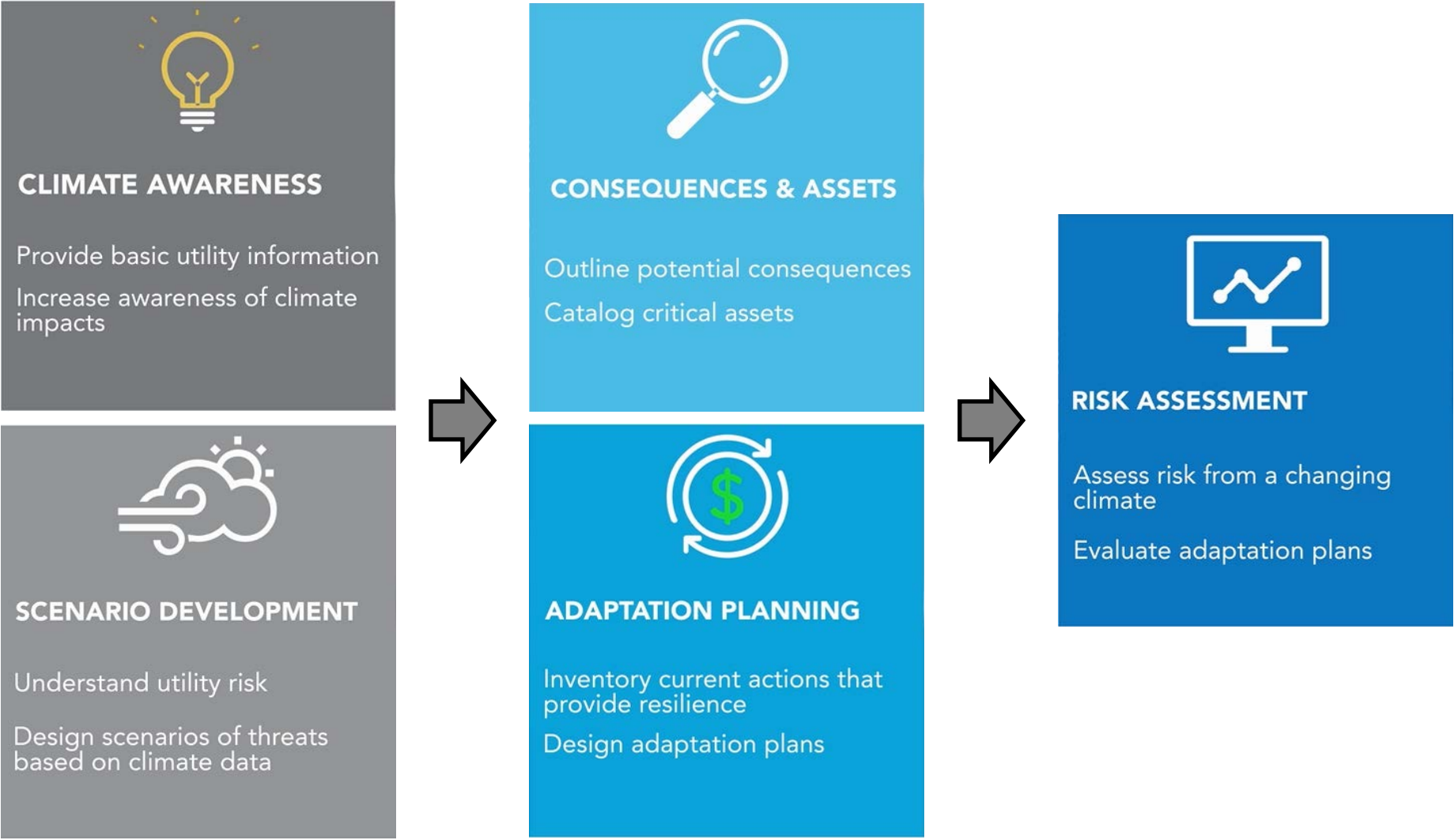


## ADAPTATION PLANNING

Inventory current actions that provide resilience  
Design adaptation plans

- Are there **current measures** already in place to provide resilience to threats?
- What **adaptation plans** could be implemented to increase resilience?

# CREAT Process



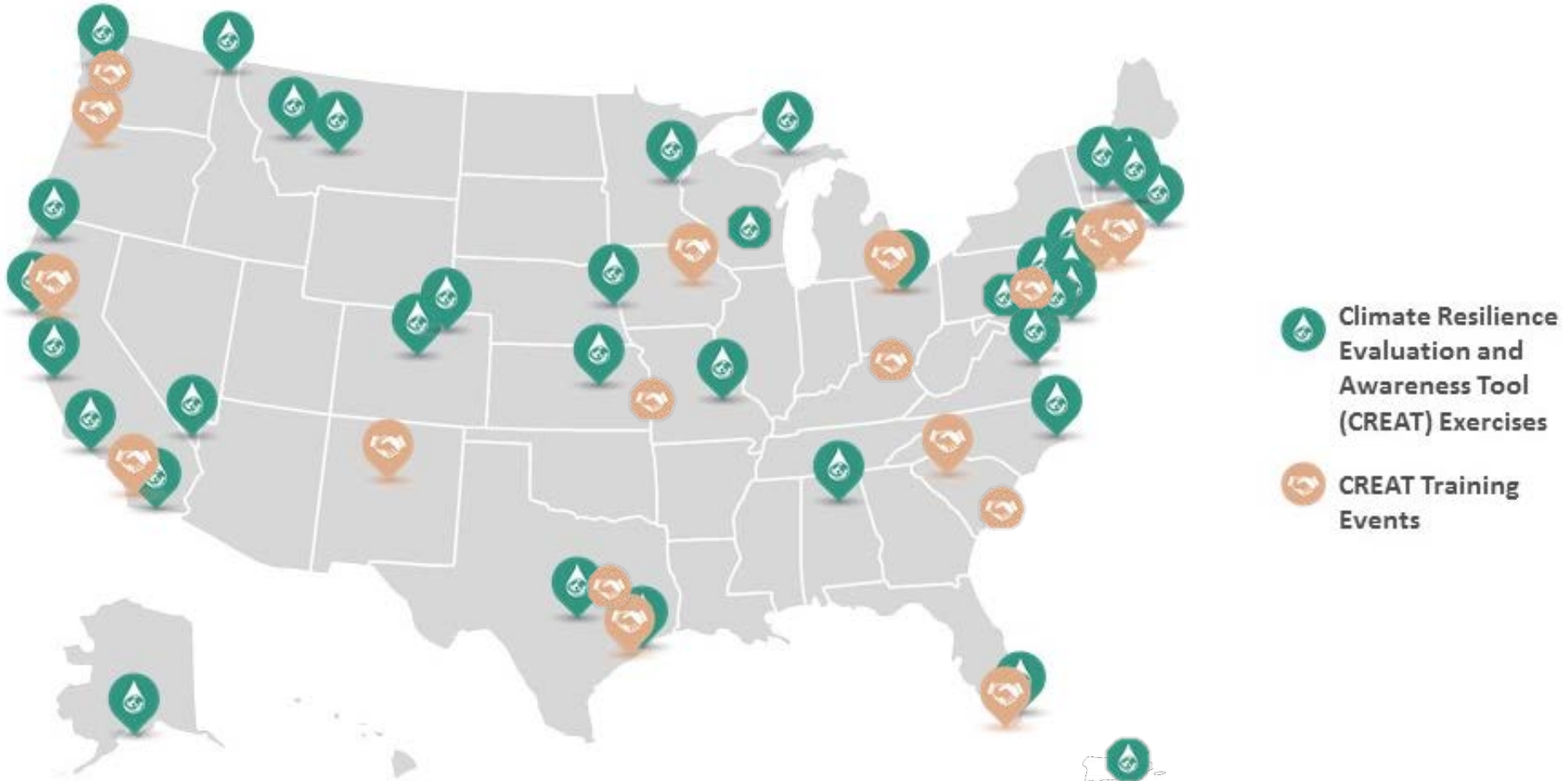


# Applications of CREAT

- Opportunity to inform communications with decision-makers, customers, and funders on potential risks and response options
- Process supports evaluation and prioritization of current plans or more prospective options for building resilience
- Results can be integrated to build out plans based on common climate scenarios and economic assumptions
  - Multiple consequence categories for a single system
  - Multiple systems or sectors serving a single community/municipality
  - Multiple communities with shared watershed/resources



# Water Utility Climate Resilience Support Projects



# Panelists

- **Michael Ruppel, Executive Director**
  - South Monmouth Regional Sewerage Authority
    - Belmar, NJ
  - **Rina Dalal**, T&M Associates
  
- **Andy Kricun, Executive Director**
  - Camden County Municipal Utilities Authority
    - Camden, NJ

# Adaptation Case Study and Information Exchange

## Adaptation Case Study and Information Exchange

Creating Resilient Water Utilities



Welcome and Case Studies

Drought

Floods

Ecosystem Changes

Service Demand

Water Quality

Videos

Welcome to the U.S. Environmental Protection Agency's (EPA) Adaptation Case Study and Information Exchange, which has been developed under the Creating Resilient Water Utilities (CRWU) initiative.

This tool provides brief stories of adaptation planning efforts being conducted by water utilities across the United States. These utilities have shared their experiences and lessons learned to assist other water sector utilities currently responding to natural hazards and adapting to extreme weather.

EPA encourages utilities that are pursuing adaptation efforts of their own to share their story using this map.

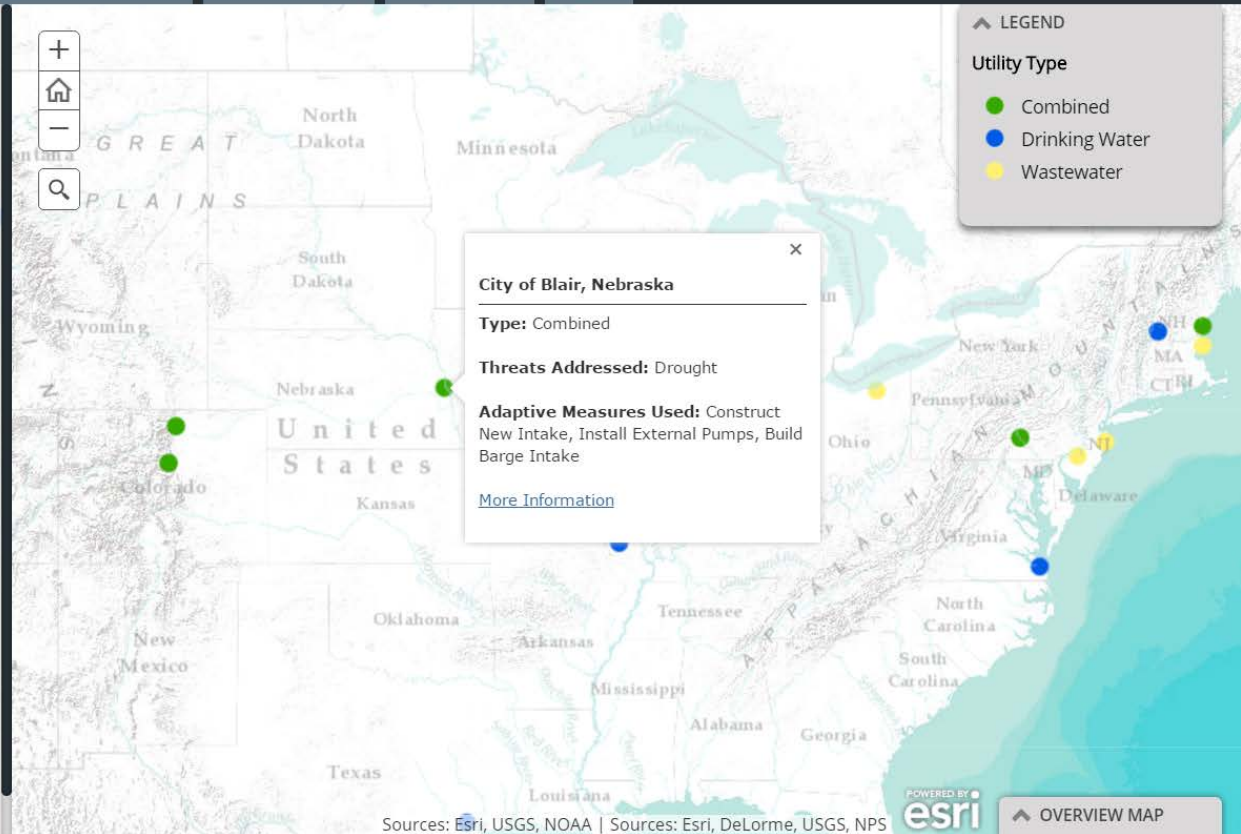
[Click here to contact us if you would like to share your story](#)

### How to use this map

Each point on this map represents a drinking water, wastewater or combined utility that has shared their story. Clicking on a point generates a pop-up box that provides the name, type and applicable climate threats facing a particular utility, as well as the corresponding actions that the utility plans to implement. Click on the tabs located at the top of the page to filter the utilities by priority concern.

If you'd like to know more and connect with any case study, click the 'More Information' link near the bottom of the pop-up to access a brief summary of the utility's story, including contact information for the utility.

To learn more about building resilience at your utility, please visit [epa.gov/crwu](http://epa.gov/crwu).



# Adaptation Case Study and Information Exchange

## Case Study: Water and Wastewater Utilities Planning for Climate Change



### CITY OF HOUSTON, TEXAS

#### Background

The city of Houston's Public Works and Engineering Department provides drinking water to the Houston area. Historically, the city of Houston's drinking water has been sourced from groundwater. However, due to local subsidence from groundwater extraction, surface water from Lake Houston and Lake Conroe – now provide 80 percent of the area's water supply.

The city of Houston owns a significant volume of surface water rights in the San Jacinto River basin. Although the city may not be immediately threatened by water scarcity, the city is planning appropriately and anticipating potential changes in water demand and availability.

#### Climate Threats

The city of Houston has evaluated the potential impacts of a multi-year drought in the 1950s, as well as a long-term version of the 2011 drought. The impacts of these droughts include:

- Impacts to treatment infrastructure from lowered lake levels.
- Increased stress on groundwater sources.
- Increased demand on the city's raw water system, which could be coupled during hot and dry weather as seen during the 2011 drought. During this drought, the city experienced system-wide water main breaks that were nearly ten times normal.

#### Planning Process

## Case Study: Water and Wastewater Utilities Planning for Climate Change



### CITY OF BLAIR, NEBRASKA

#### Background

The city of Blair, Nebraska provides drinking water and wastewater services to residential, industrial and commercial customers. The city of Blair owns and operates the entire municipal water system, including a 20 million gallons per day (MGD) water treatment plant that draws from the Missouri River. Drinking water demand for residential, commercial and industrial customers is described in Table 1. The city of Blair has an interconnection with Omaha through a rural system that can provide up to 1 MGD in case of an emergency.

**Table 1. City of Blair Drinking Water Demand**

CUSTOMER	WATER DEMAND
Residential	Average: 1 MGD; Peak demand: 4 MGD City of Blair: population 8,000 Additional small rural systems outside the city: population of 2,000 – 4,000
Industrial – Cargill biocampus	10-15 MGD; higher demand in summer months
Industrial – Omaha Public Power Plant (OPPD) nuclear power plant	0.4 MGD OPPD switches over to the city of Blair's water source in warmer months when the temperature in their usual source water is too high and could cause the nuclear plant to



# Thank you!

**Visit us on the web  
and register for CREAT:**  
[www.epa.gov/crwu](http://www.epa.gov/crwu)

Curt Baranowski, [Baranowski.Curt@epa.gov](mailto:Baranowski.Curt@epa.gov)

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Sewerage Authority

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