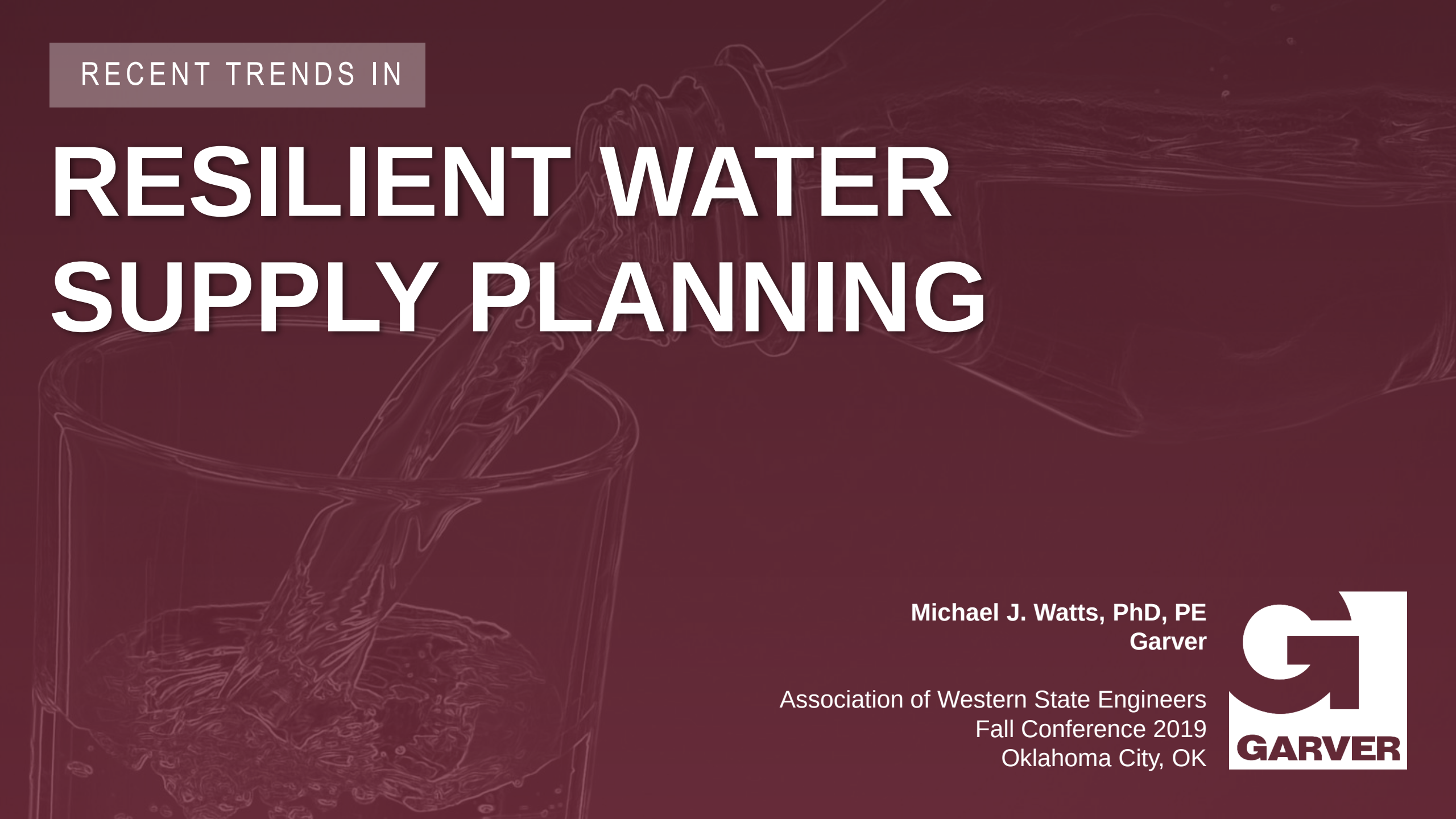
RECENT TRENDS IN

RESILIENT WATER SUPPLY PLANNING



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Association of Western State Engineers
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GARVER

AGENDA

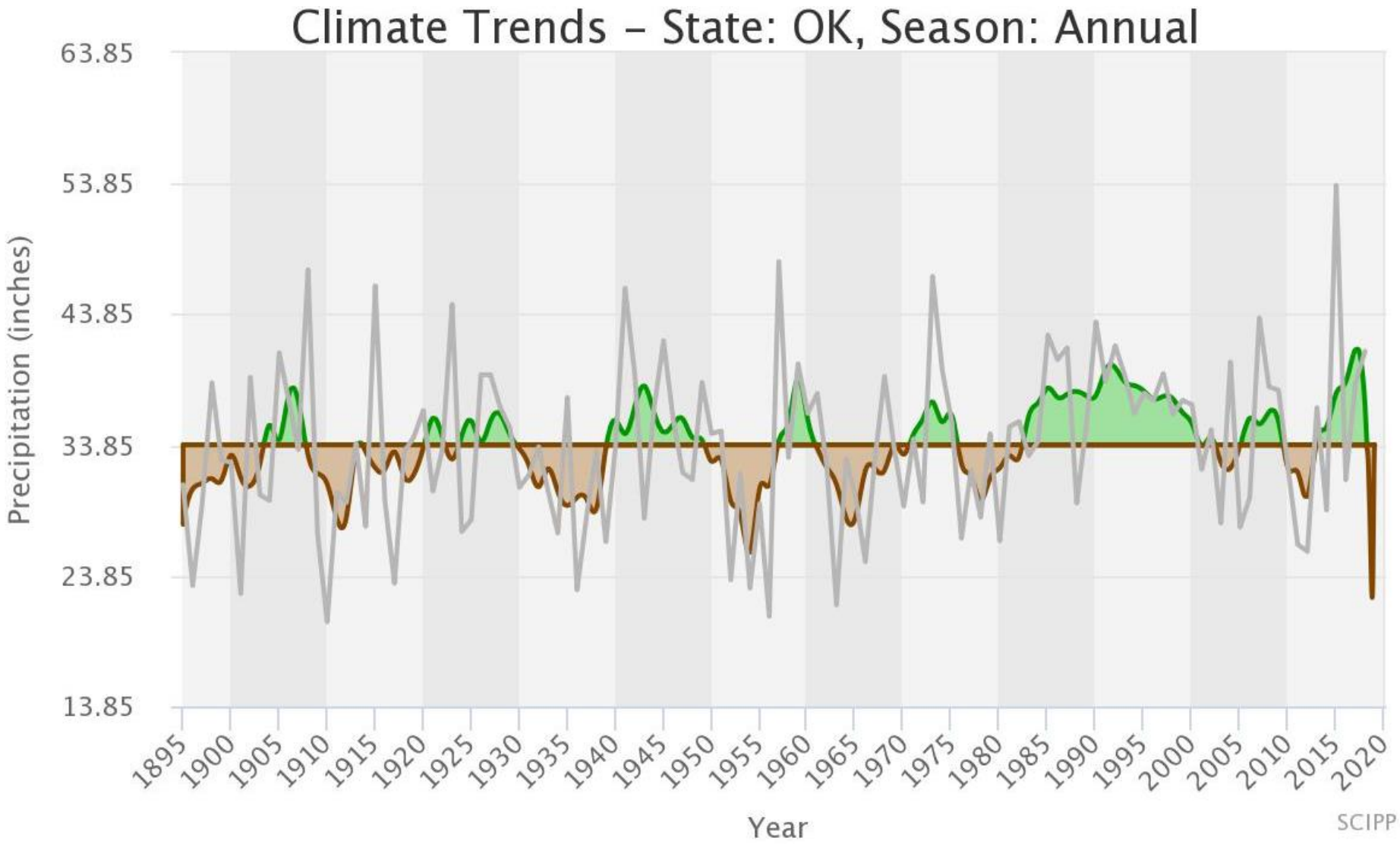
- The Challenge
- A New Definition for *R&D*
- Supply Diversification
- Risk & Resiliency
- Discussion

THE CHALLENGE

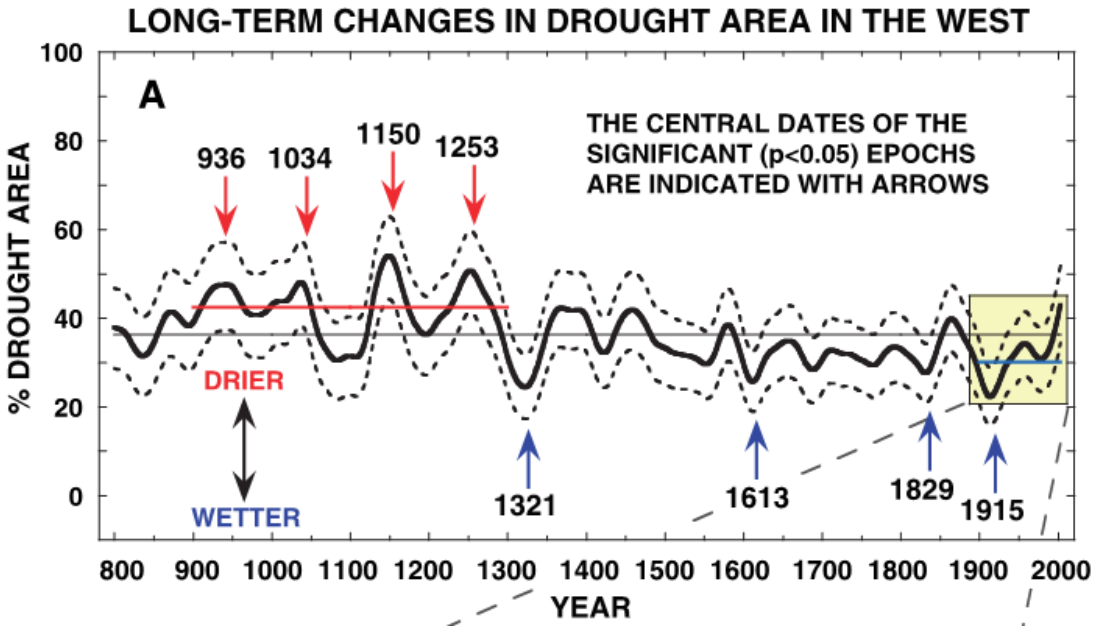
Unlike the Eastern Seaboard, Western States are defined by concentrated, **rapidly growing population centers** (or *Megaregions*).

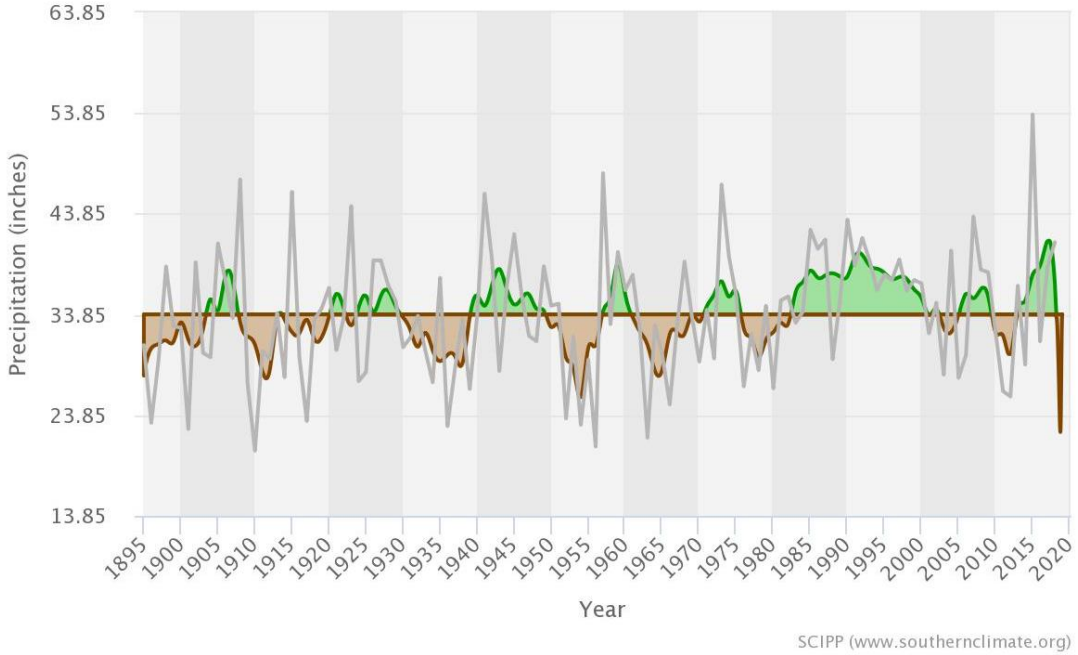
Source:

Water utilities in Western States know the challenge of **consistently meeting a growing water demand**.



However, published historical records for the Western States **indicate that we live in a relatively 'wet' period**.





Edward R. Cook, et al (2004) *Science* 306

A NEW DEFINITION OF R&D

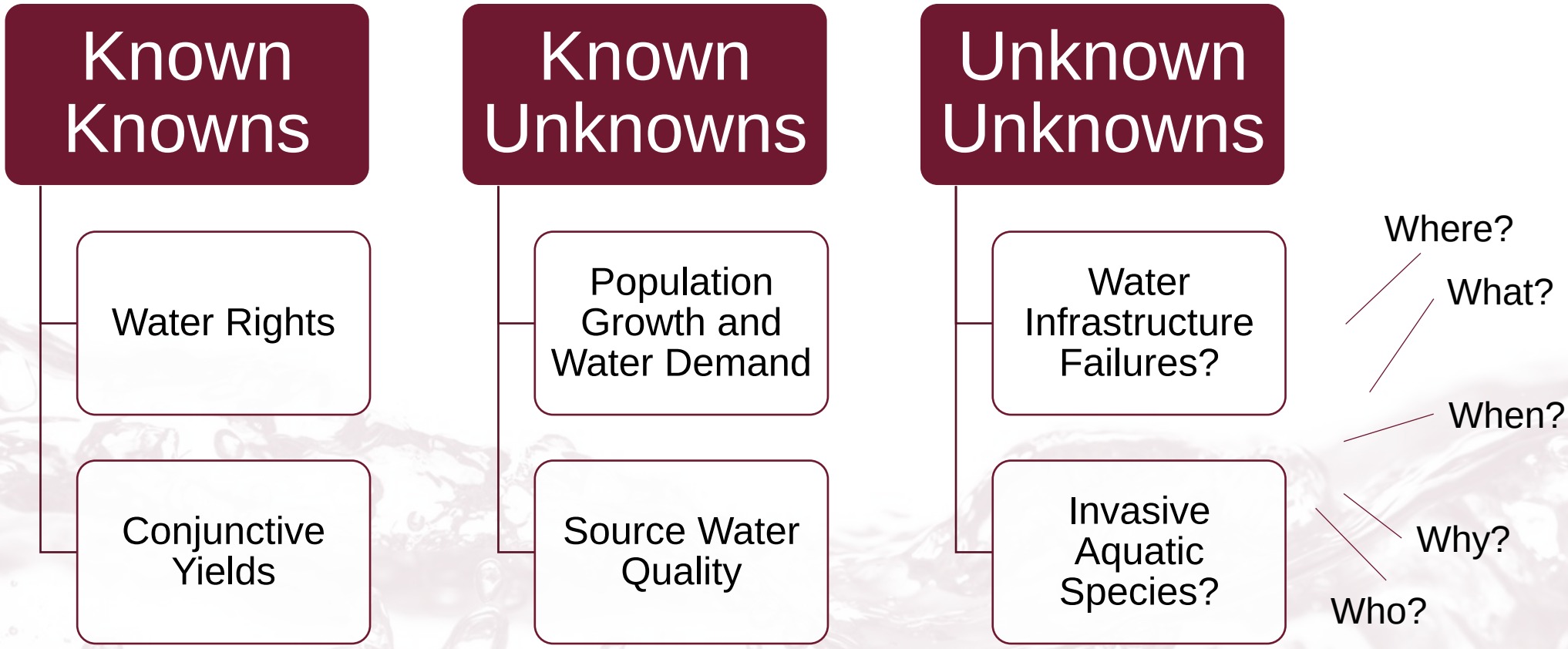
“There are known knowns. **These are things we know that we know.**

There are known unknowns. That is to say, there are things that **we know we don’t know.**

But there are also unknown unknowns. There are things **we don’t know we don’t know.”**

- Donald Rumsfeld

When it comes to water supply, there remain *unknown unknowns*.



Planning for water supply *Resiliency & Diversity* can help utilities solve their known and unknown unknowns.

KNOWN UNKNOWNS

- Portfolio diversification through evaluation of water supply alternatives
- Localized water reuse and reclamation

UNKNOWN UNKNOWNS

- Identify risks and vulnerabilities
- Strengthen for resiliency in key areas

SUPPLY DIVERSIFICATION

Communities in Western States have developed a diverse portfolio of water reuse programs

Residential Irrigation

Public parks / golf course irrigation

Fire protection

Irrigation of food crops (subsurface drip)

Amenity Lakes

Indoor uses (toilet flushing)

Utilities often answer the following key questions when considering the benefits of expanded water reuse:

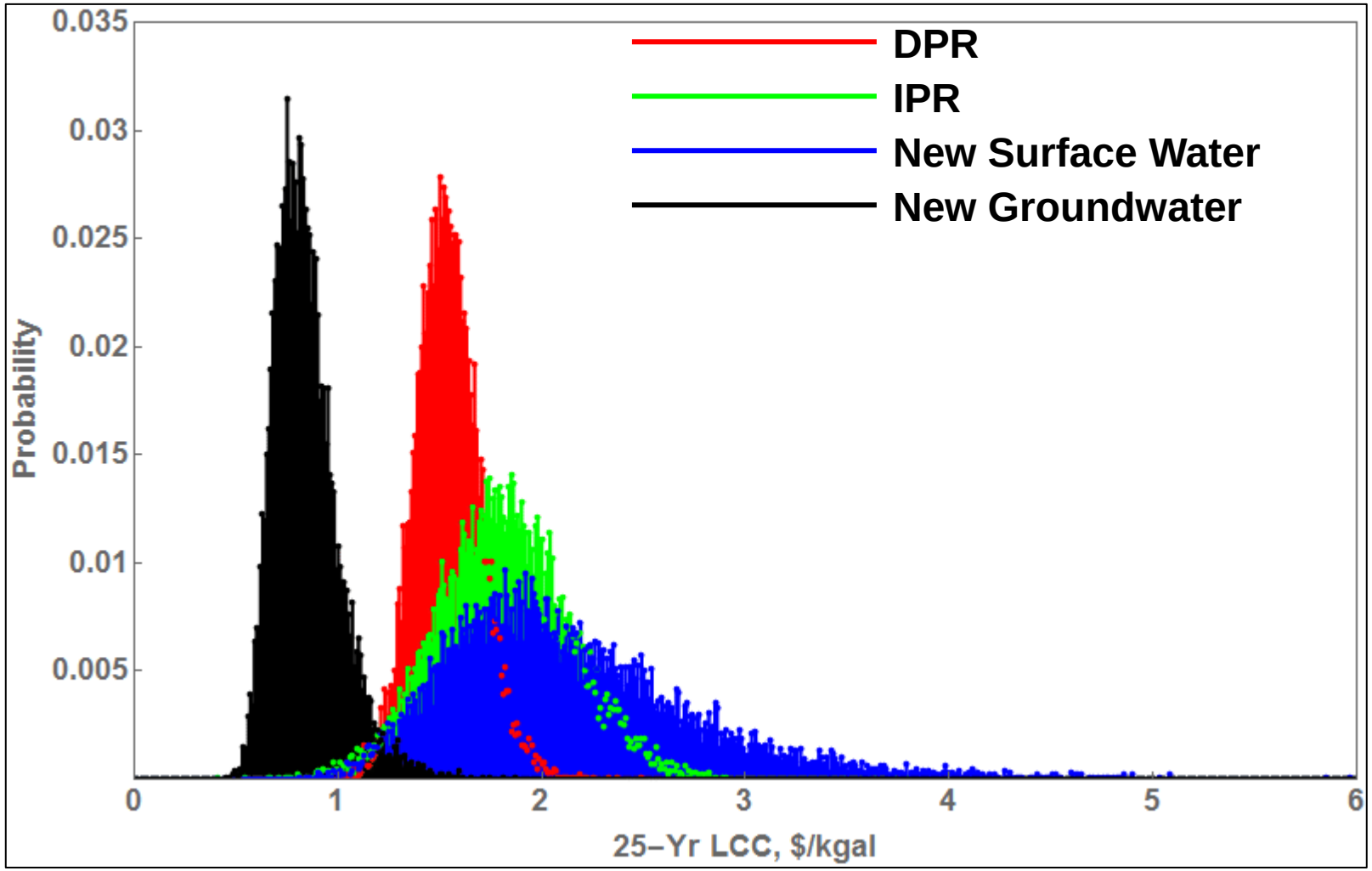
HR Transactions
- HR Compliance

How do you achieve sustainable and cost-effective water reuse?

How do you identify customers and treatment methods to serve your community?

New forecasting tools are assisting utilities when assessing the potential benefits of expanded water reuse

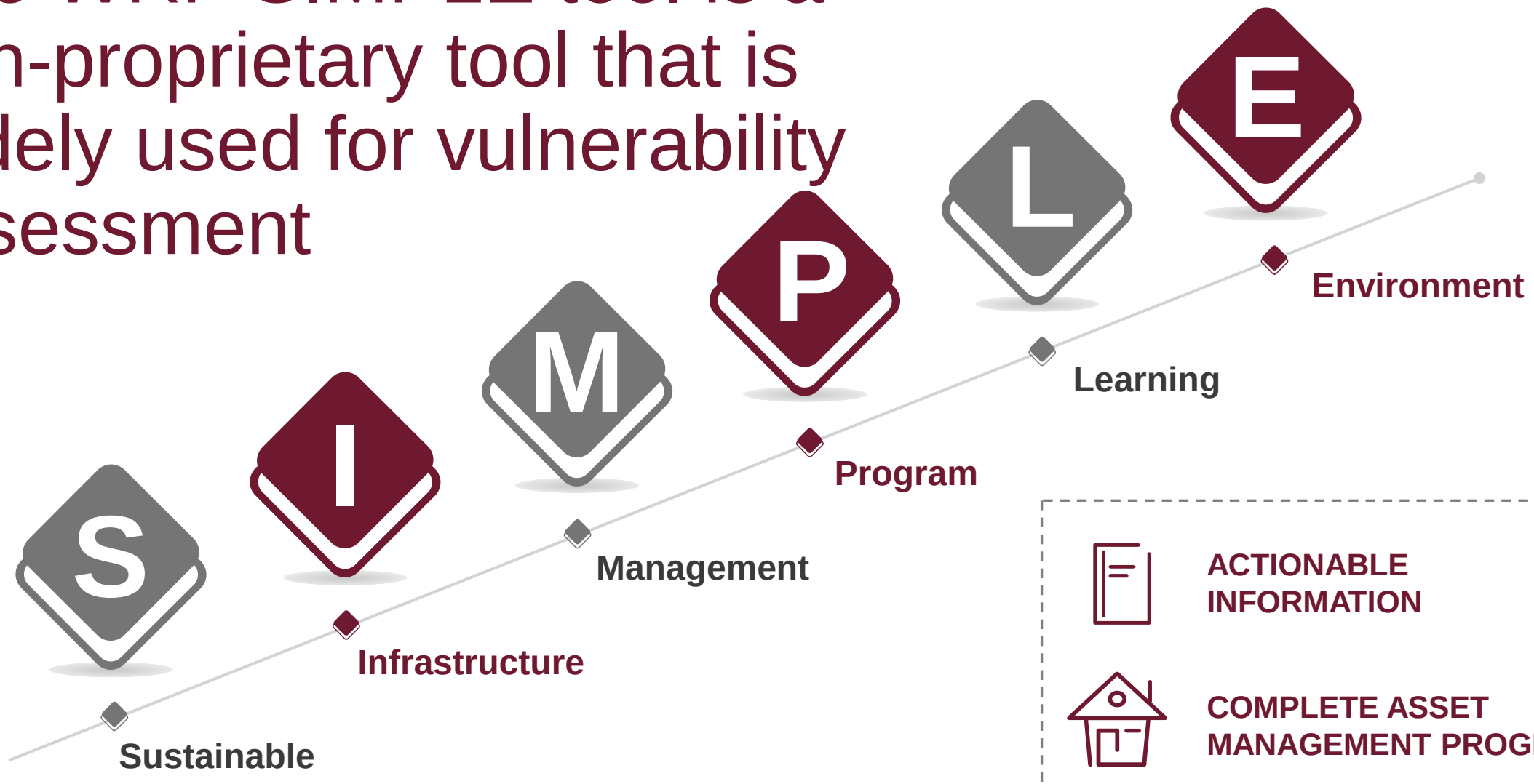
These forecasting tools allow utilities to identify and avoid costly alternative water supply sources



RISK & RESILIENCY

Utilities are also taking pro-active measures to reduce vulnerabilities in existing and future water supplies

The WRF SIMPLE tool is a non-proprietary tool that is widely used for vulnerability assessment

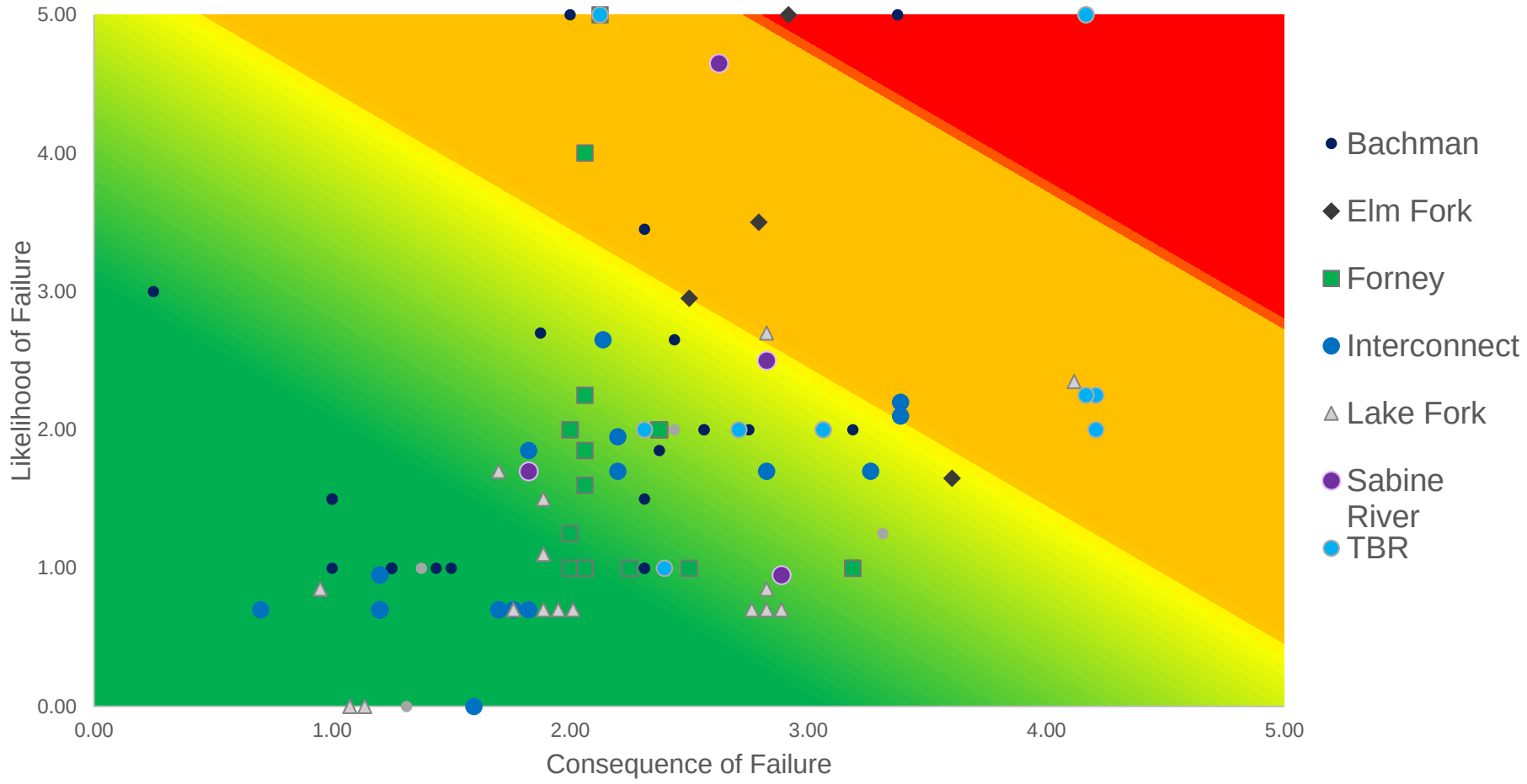


ACTIONABLE INFORMATION

COMPLETE ASSET MANAGEMENT PROGRAM

The WRF SIMPLE Tool considers risk in several key areas

Tools like SIMPLE allow utilities to build System-Wide Risk Maps



The Federal Government is also playing a role in Risk & Resiliency planning

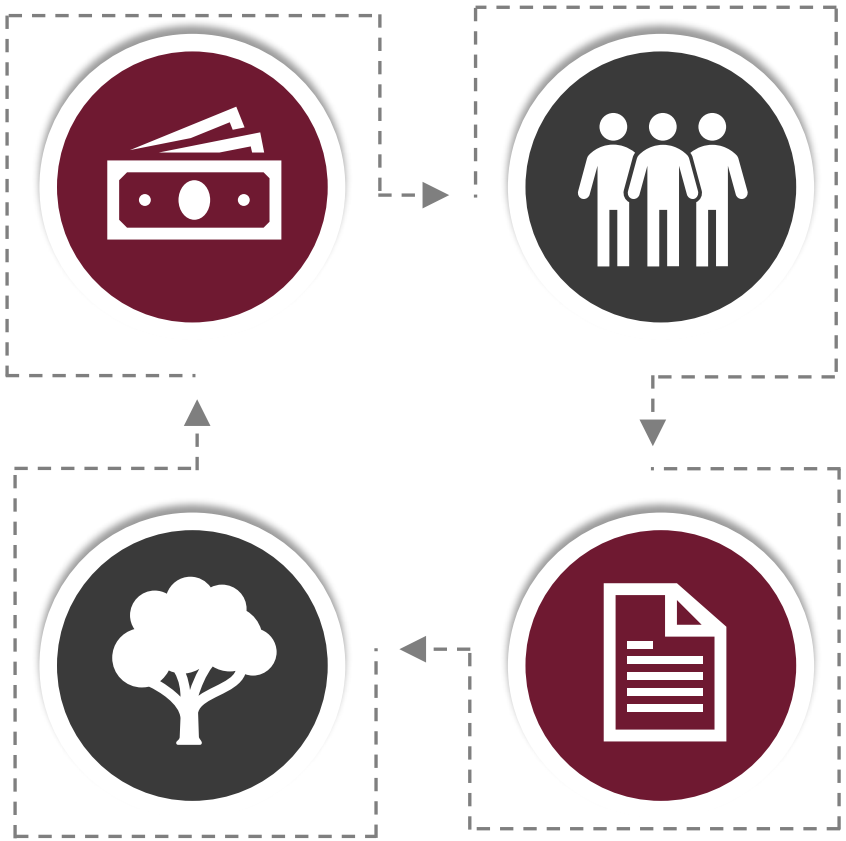
America's Water Infrastructure Act (AWIA) of 2018 was intended to assist with risk mitigation:

Finance

- Authorizes $4.4 billion for DWSRF
- Reauthorizes WIFIA @ $50 million/year

Customers

- Twice/year Consumer Confidence Reports



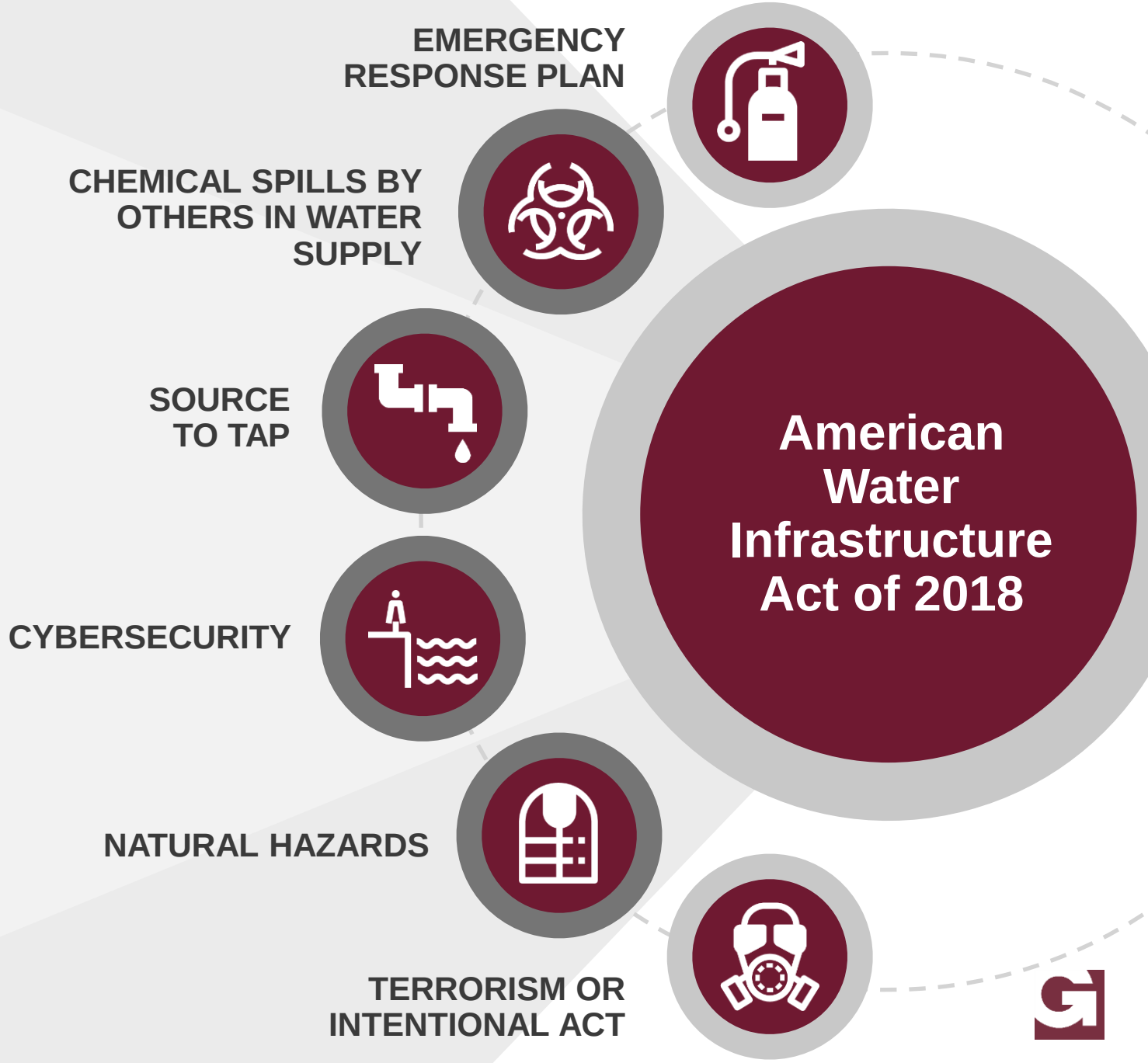
Conservation

- Renewal of WaterSense program

UCMR

- All systems >3,300 will monitor starting in 2022

AWIA 2018 also considers



A public utility must assess the risk & resilience of its system(s) including:

EPA | State | **Public Systems**

- **Malevolent acts & natural hazards**
- **Resilience of assets (including cybersecurity)**
- **Monitoring practices**
- **Financial infrastructure**
- **Chemical use, storage, & handling**
- **System O&M**

**May include an evaluation of capital and operational needs for risk and resilience management*

Public water systems must review, update, & recertify every five years after the initial submittal

Utility Size	Est. # of Community Water Systems	Risk & Resilience Assessment	Emergency Response Plan
>100K	435	March 31, 2020	September 30, 2020
50k – 100k	594	December 31, 2020	June 30, 2021
3,300 – 50k	8, 295	June 30, 2021	December 30, 2021

Thank you

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