

Dealing with Disruption: Operationalizing
Resilience in the Water Sector

Resilience & Smart Communities

December 5, 2019 | 2:00 PM – 3:30 PM ET



Co-hosted by:



Speakers



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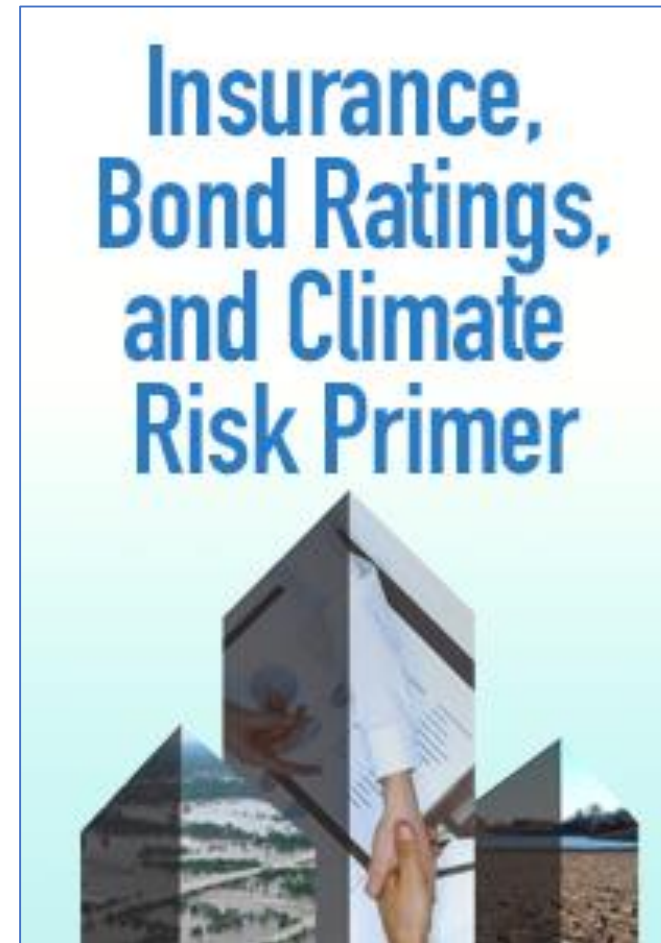
Erica Brown

**Chief Strategy and
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Association of Metropolitan
Water Agencies



Available now:
[amwa.net/
climateprimer](https://amwa.net/climateprimer)



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Credit Agencies and Climate Resilience

- Measured as part of rating agencies' bond ratings assessment
 - Operational risk management assessment
 - Financial management assessment
- S&P's 2016 ratings criteria for operational risks assessment for U.S. municipal waterworks, sanitary and drainage utility systems
 - Criteria consider specific climate risk assessment strategies, such as supply planning and flood protection



Environmental, Social, Governance (ESG) factors are...

- Embedded in most credit rating agencies' criteria already
- Part of a credit ratings initiative facilitated by the UN Principles for Responsible Investing (PRI) - aimed at aligning understandings between credit rating agencies and investors
- Of growing importance to private sector investors and governing boards, e.g. Nov. 2019 Ceres report calling on corporate boards to oversee ESG issues

Examples of ESG factors considered in credit ratings

Environmental	Social	Governance
Environmental compliance	Affordability programs	Sound financial management practices
Source water/watershed protection	Exposure to unrest (labor, political)	Board structure/Organizational effectiveness
Extreme event impacts	Change in demographics affecting need for infrastructure	Transparency of policies and decision making



What can utility managers do?

1. Manage risk

- Enterprise risk management
 - Operational management
 - Asset management
- Environmental stewardship
 - Climate adaptation
 - Energy management
- Financial management
 - Cash flow
 - Reserves or insurance
 - CIP

2. Tell your story



CLIMATE CHANGE AND RESILIENCY

Implications for Enterprise Risk Management & Financial Impacts



Paul Fuller, CPCU / CEO, Allied Public Risk
Lorilee Medders, PhD / Appalachian State University



2019 Resilience Webinar Series
December 5, 2019



CLIMATE CHANGE IMPACT ON INSURANCE INDUSTRY

Perspective on Underwriting & Investment Portfolios

- ▶ Evolution in our Thinking
- ▶ Laggard to Thought Leader
- ▶ Elevated Threat
 - Underwriting
 - Investments
 - Regulator & Rating Agency Concurrence
 - Heightened Climate Change Weight on Stress/Solvency Tests
- ▶ Climate Change = Grey Rhino
 - Our New Normal
 - Industry Solutions



CLIMATE CHANGE IMPACT ON WATER & WASTEWATER UTILITIES

Perspective on Insurance Policies and Municipal Bonds

- ▶ Insurance Carrier-to-Policyholder Relationship
 - Tightening Property Marketplace
 - Transformational Liability Changes
 - Insurance Industry as Institutional Buyer of Municipal & Utility Revenue Bonds
 - \$500 Billion Portfolio
- ▶ Climate Change vs Conventional Wisdom
 - Heightened Buyer Scrutiny
- ▶ Climate Change = Grey Rhino
 - Your New Normal
 - Bond Competition



CLIMATE CHANGE IMPACT ON RATING AGENCIES

Perspective on Municipal Bond Rating Agencies

- ▶ Credit Ratings
 - Purpose & Meaning
- ▶ Impact of ESG
 - Definition
 - Application
 - New or Existing Concept?
- ▶ Weight of Water/Wastewater Utility Actions
 - Operations
 - Risk Management
 - Financial Management
 - Bond Competition



SUGGESTED NEXT STEPS FOR WATER & WASTEWATER UTILITIES

Action Items

- ▶ Develop Resiliency
 - Preparations & Adaptations
- ▶ Establish Holistic Enterprise Risk Management Program (ERM)
 - Structure & Purpose
 - Integration of Risk & Finance
 - Identification of Blind spots
- ▶ Communicate Plan with Stakeholders
 - Ratepayers
 - Insurers
 - Bond Buyers
 - Rating Agencies



QUESTIONS & ANSWERS



Albert Cho
**Vice President and
General Manager**
Advanced
Infrastructure Analytics
Xylem, Inc.



December 2019



Driving Resilience with Decision Intelligence

Xylem – a global water technology company based in New York



WE ARE A WATER INDUSTRY LEADER WITH GLOBAL REACH ...

- Leading global water technology provider
- Approximately 16,800 global employees
- Headquarters: Rye Brook, NY; ~350 global locations
- Doing business in 150+ countries on 6 continents
- \$5.2 billion in combined sales in 2018

**...UNIQUELY POSITIONED TO HELP OUR PARTNERS
SOLVE THE WORLD'S WATER CHALLENGES**

Resilience: definitions



re·sil·ience

/rəˈzɪljəns/

noun

1. the capacity to recover quickly from difficulties; toughness.
"the often remarkable resilience of so many British institutions"
2. the ability of a substance or object to spring back into shape; elasticity.
"nylon is excellent in wearability and resilience"

Similar:

flexibility

pliability

suppleness

plasticity

elasticity



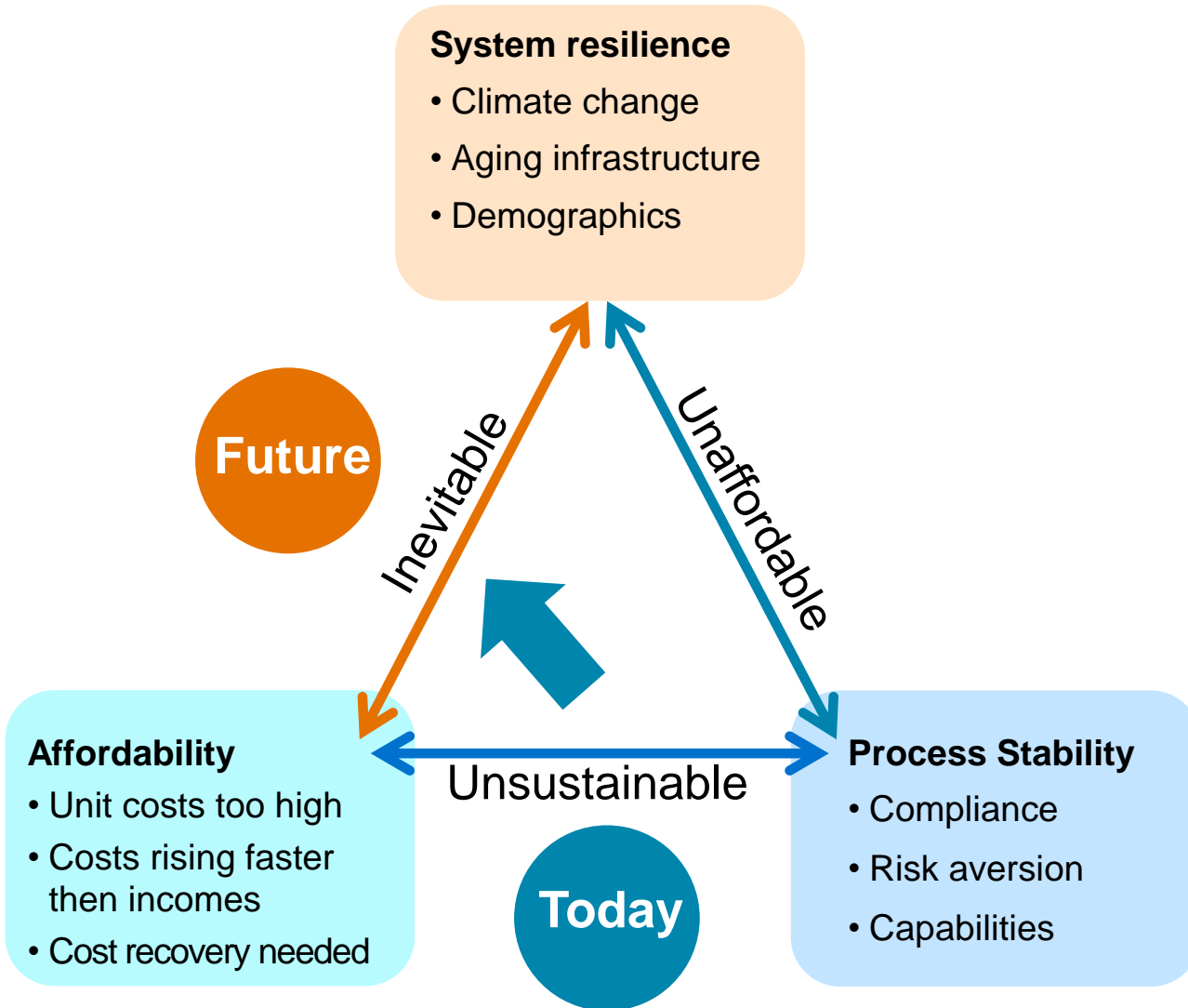
Climate resilience is the ability to anticipate, prepare for, and respond to hazardous events, trends, or disturbances related to climate. Improving climate resilience involves assessing how climate change will create new, or alter current, climate-related risks, and taking steps to better cope with these risks.



Resilience: a complex, localized, highly context-specific challenge

Source: C2ES; Oxford English Dictionary

Water infrastructure's policy trilemma



GOVERNING

THE STATES AND LOCALITIES

Cities Should Invest Now to Reduce Climate Change Depreciation

Cities are beginning to worry that a susceptibility to climate change could reduce the chance that partners will invest in them. No financial support means no funds for the infrastructure to protect against the climate.

BY ALEX BROWN, STATELINE.ORG | NOVEMBER 26, 2019 AT 3:01 AM

THE AVENUE

As fire ravages California, our infrastructure is still not equipped to handle climate change

THE WALL STREET JOURNAL.

U.S.

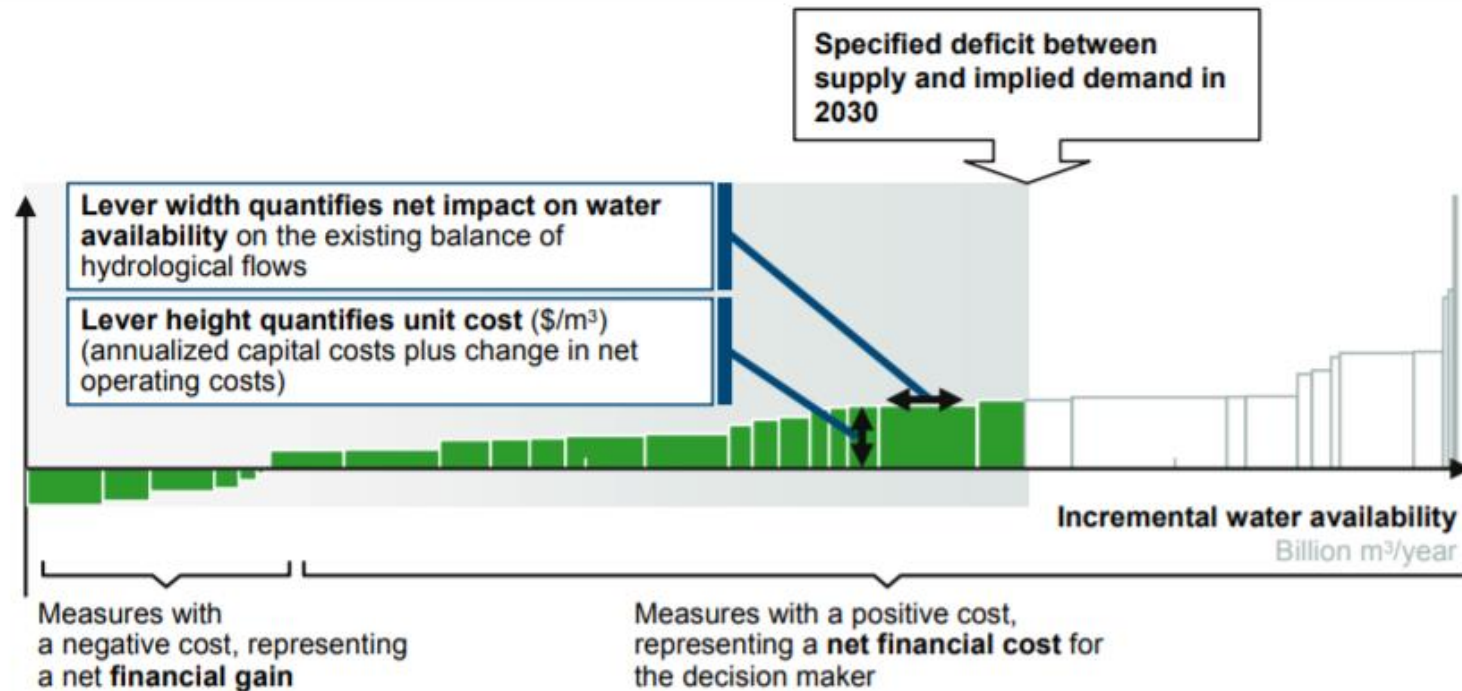
Why Your Water Bill Is Rising Much Faster Than Inflation

Rate increases average 5.5% a year as utilities race to fix corroded pipes and overflowing sewers

Resilience: managing supply portfolios

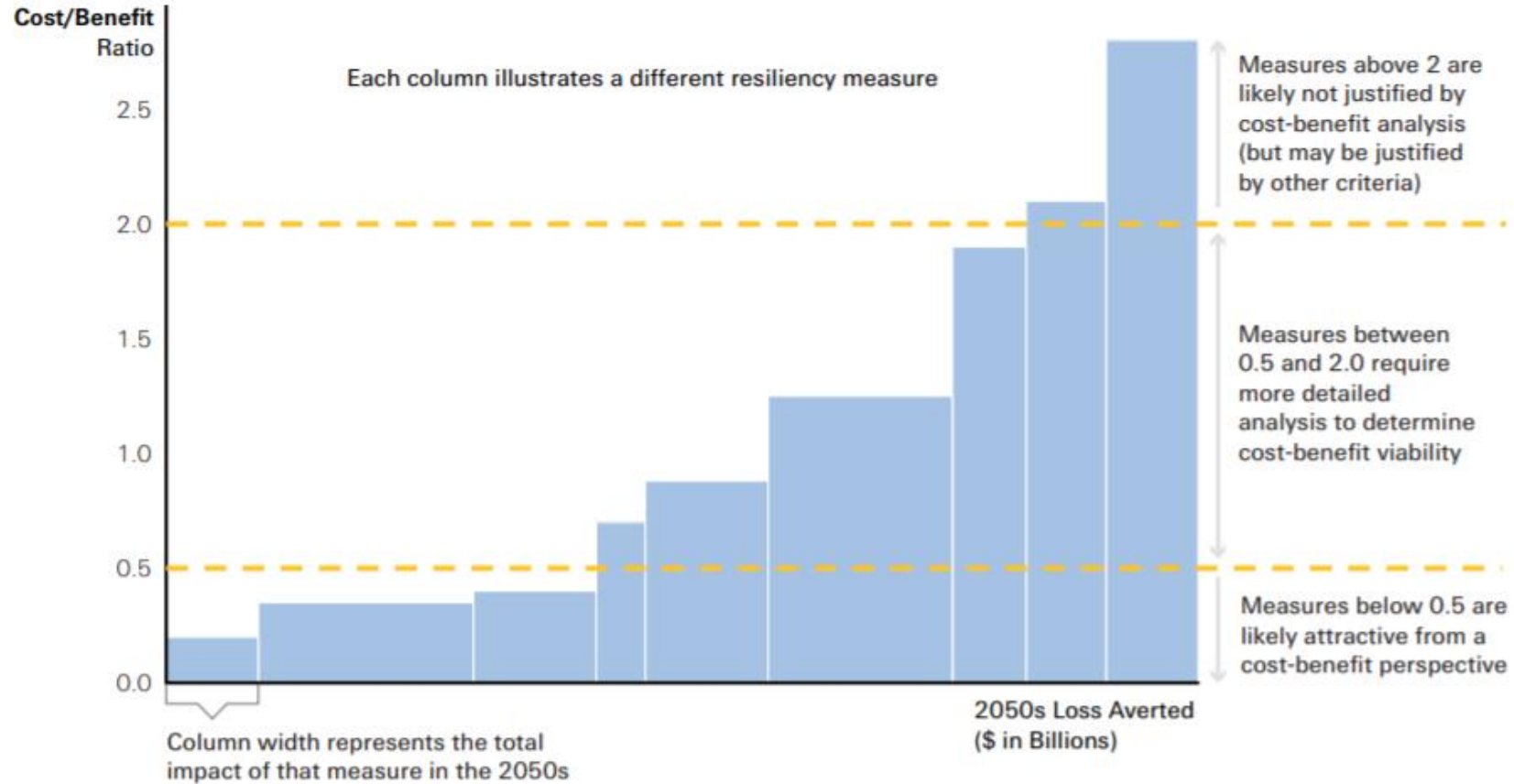
The water availability cost curve and specified supply-demand deficit

Net marginal cost in 2030
\$/m³



SOURCE: 2030 Water Resources Group

Resilience: managing risks and expected losses



Source: Swiss RE

Resilience: managing community impacts



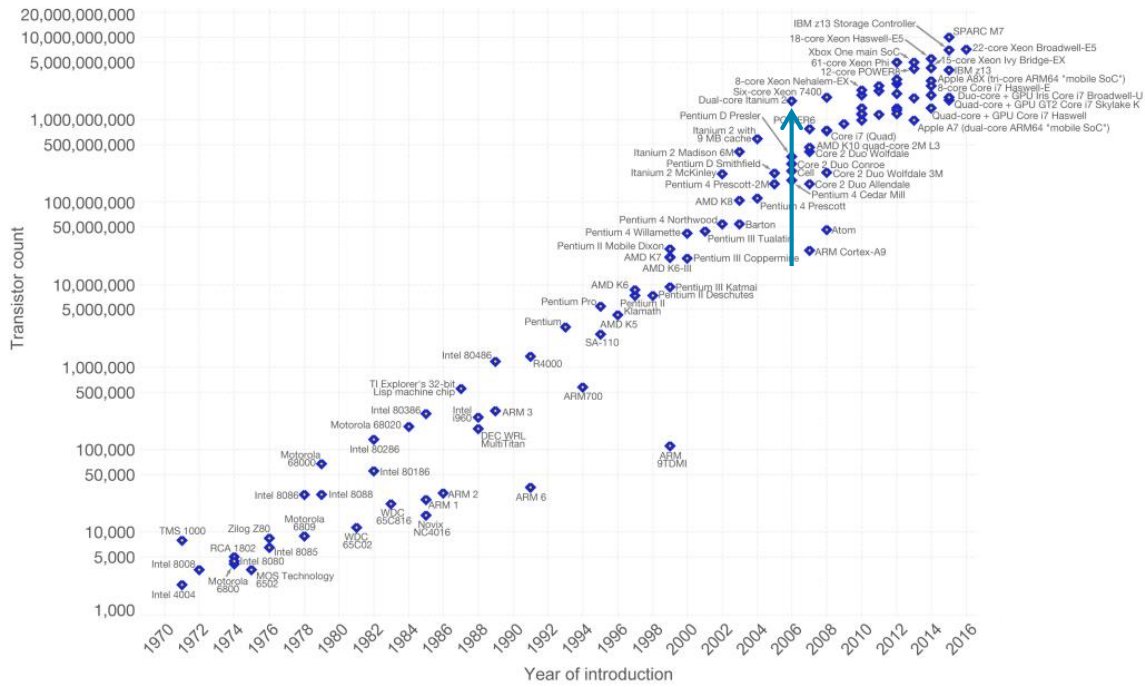
Have access to safe, clean, affordable drinking water and wastewater services

Share in the economic, social, and environmental benefits of water systems

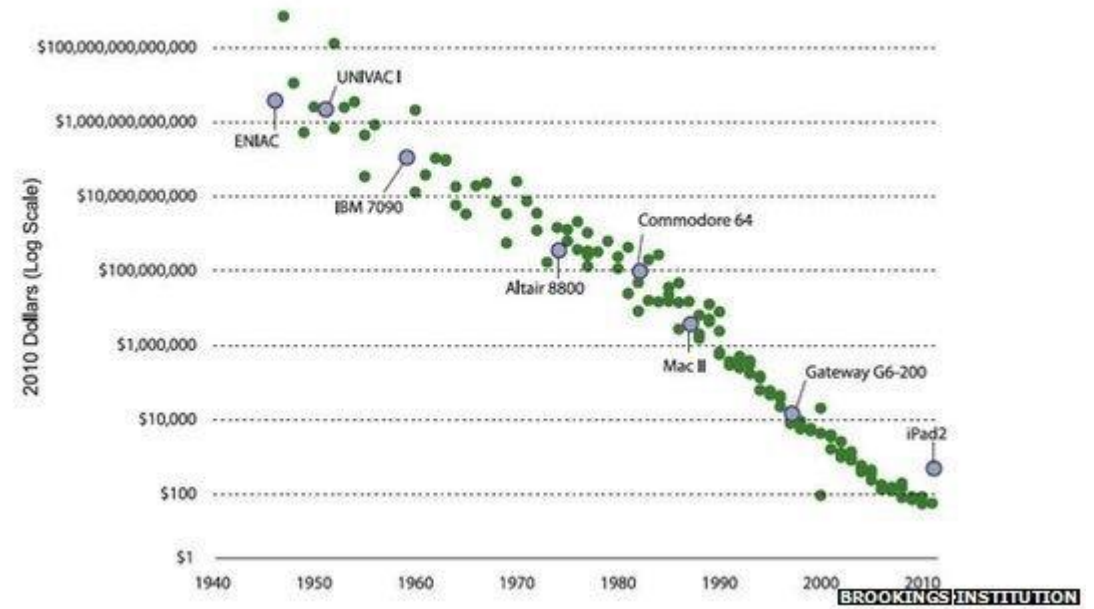
Are resilient in the face of floods, drought, and other climate risks

“ Lower-income communities are often the most vulnerable in the face of a changing climate. They are more likely to live in low-quality housing, lack insurance, and have fewer resources to rebuild and recover. As government agencies develop climate action plans, incorporating equity concerns into planning, funding, and implementation can create more resilient communities. ”

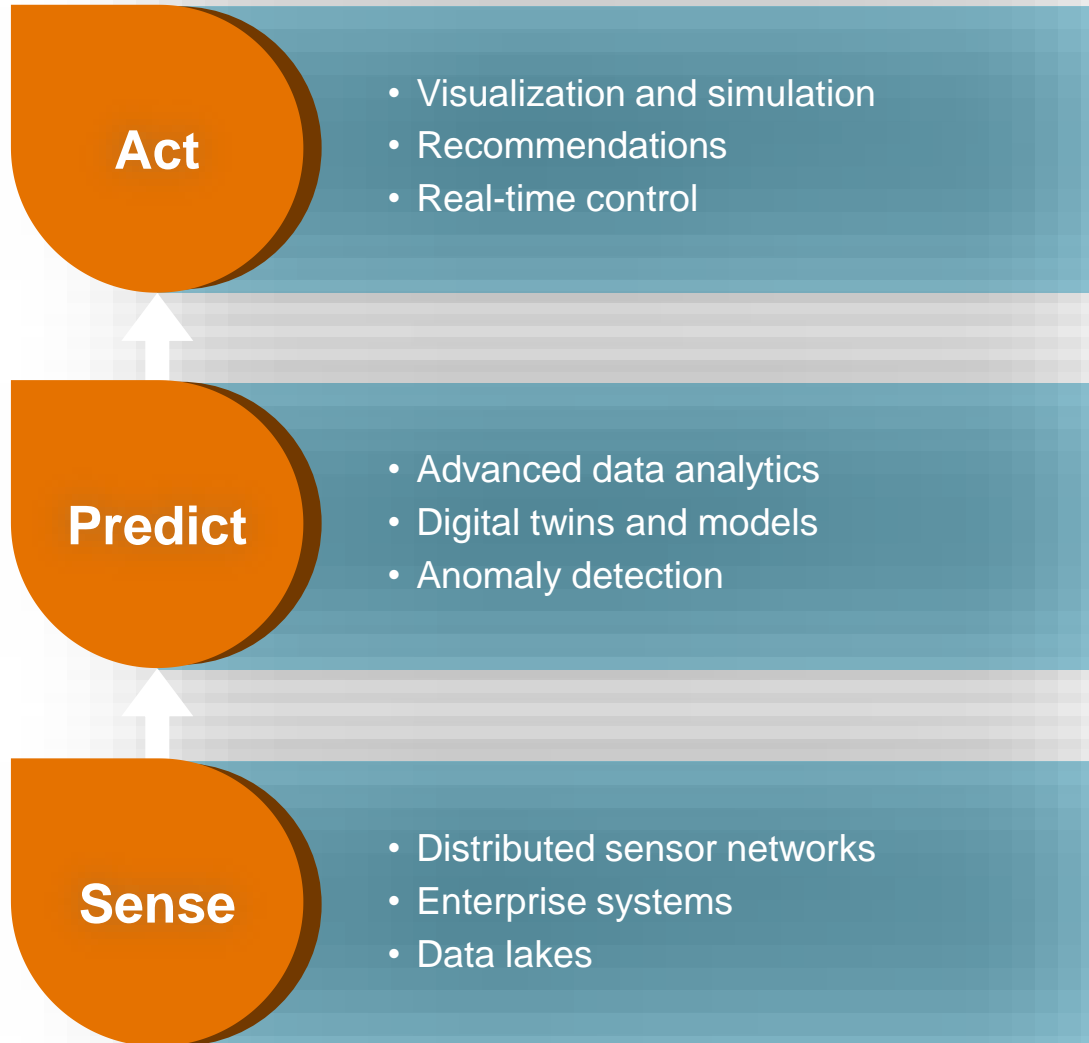
Sources of cost reduction



Cost of Computing Power Equal to an iPad 2



Decision intelligence



- How can I optimally...

Reduce system leakage?

Reduce likelihood of flooding?

Understand distributional impacts?

- And how can I do this fast enough to create real community benefits?

Resilience through decision intelligence

South Bend, Indiana

- Population: 101,000
- Annual Median Household Income: \$34,000
- Long Term Control Plan: US\$1 Billion
- Sewer flooding: 2 Billion Gallons per Year

Decision support



Tier 3: Operate the network

Implement and run Global RTC
Empower operations with RT-DSS
Maximize Performance and Resiliency



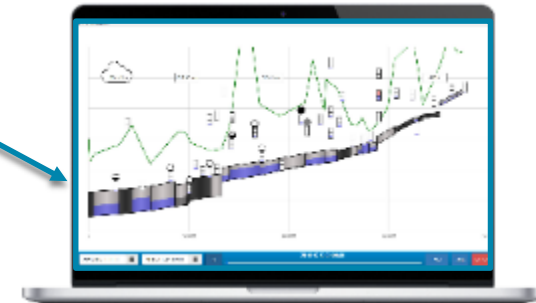
Tier 2: Create Digital Copy

Cognitive Hydraulic Models
Host and run real time models
Compare/contrast sensor and model data

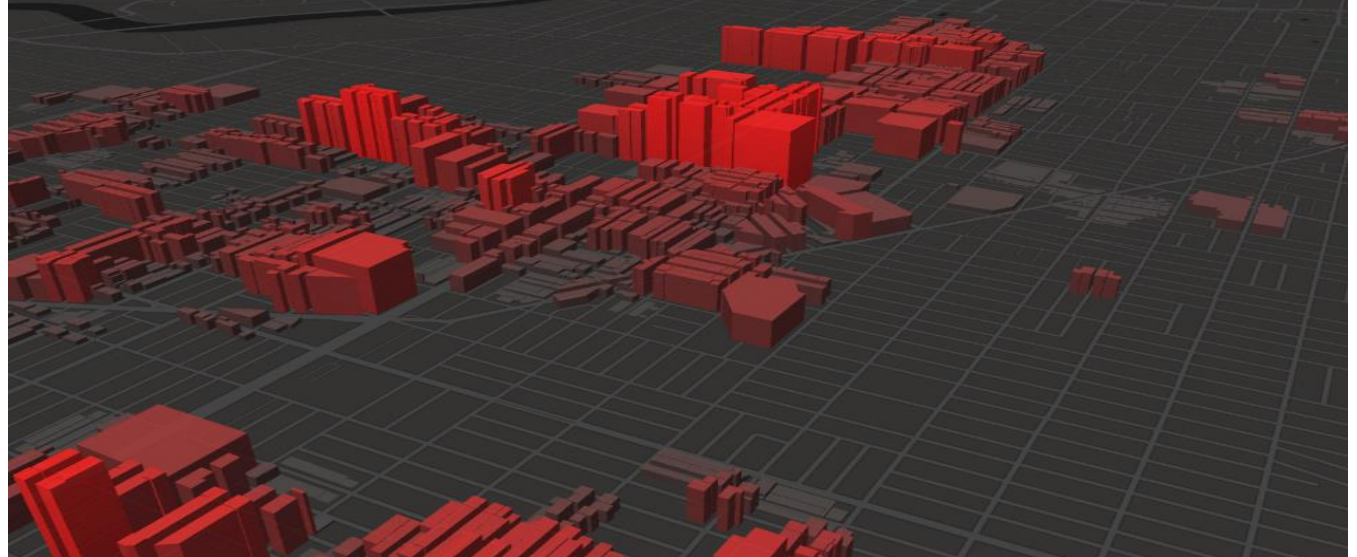
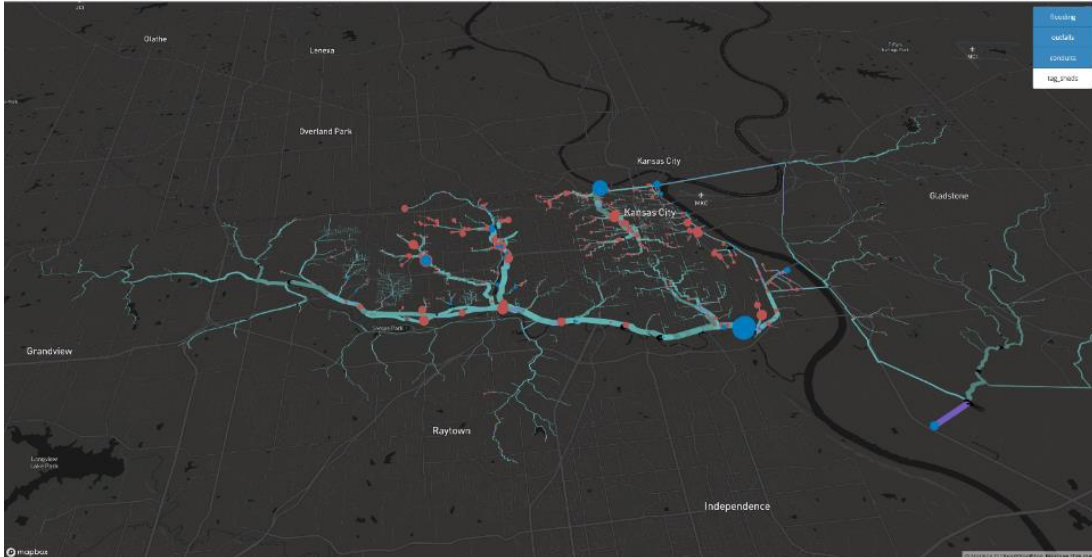
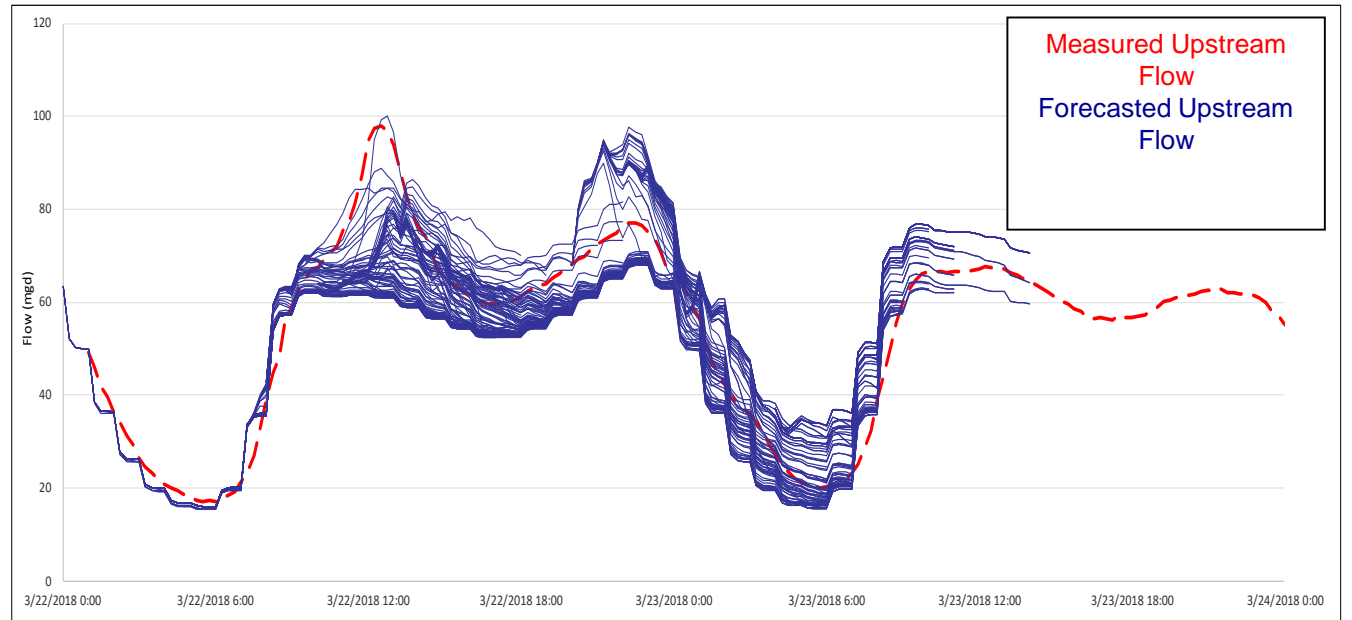
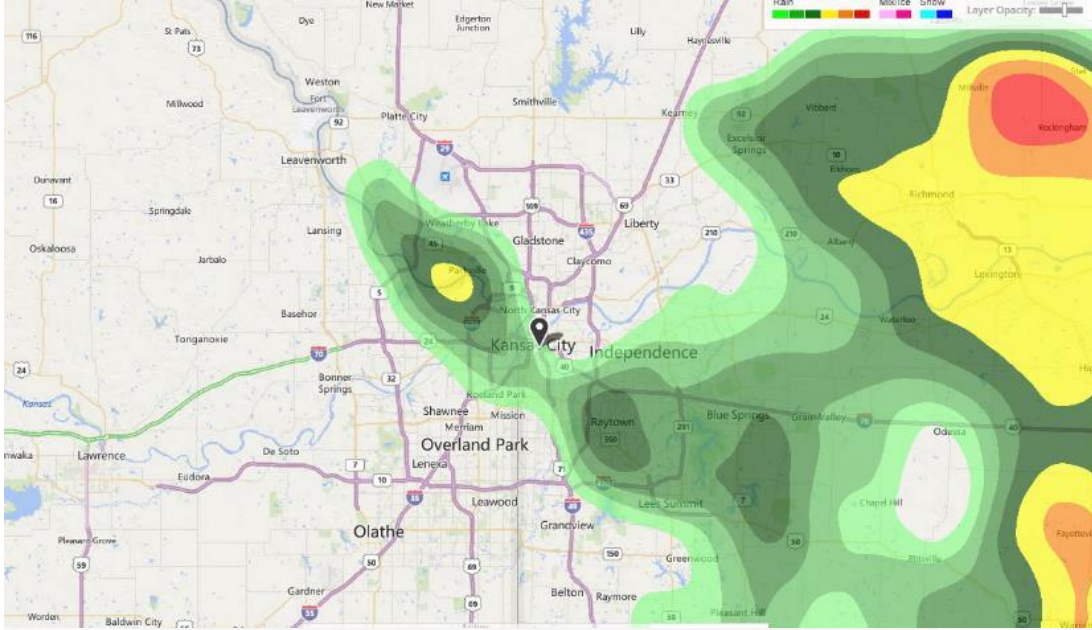


Tier 1: Turn On the Lights™

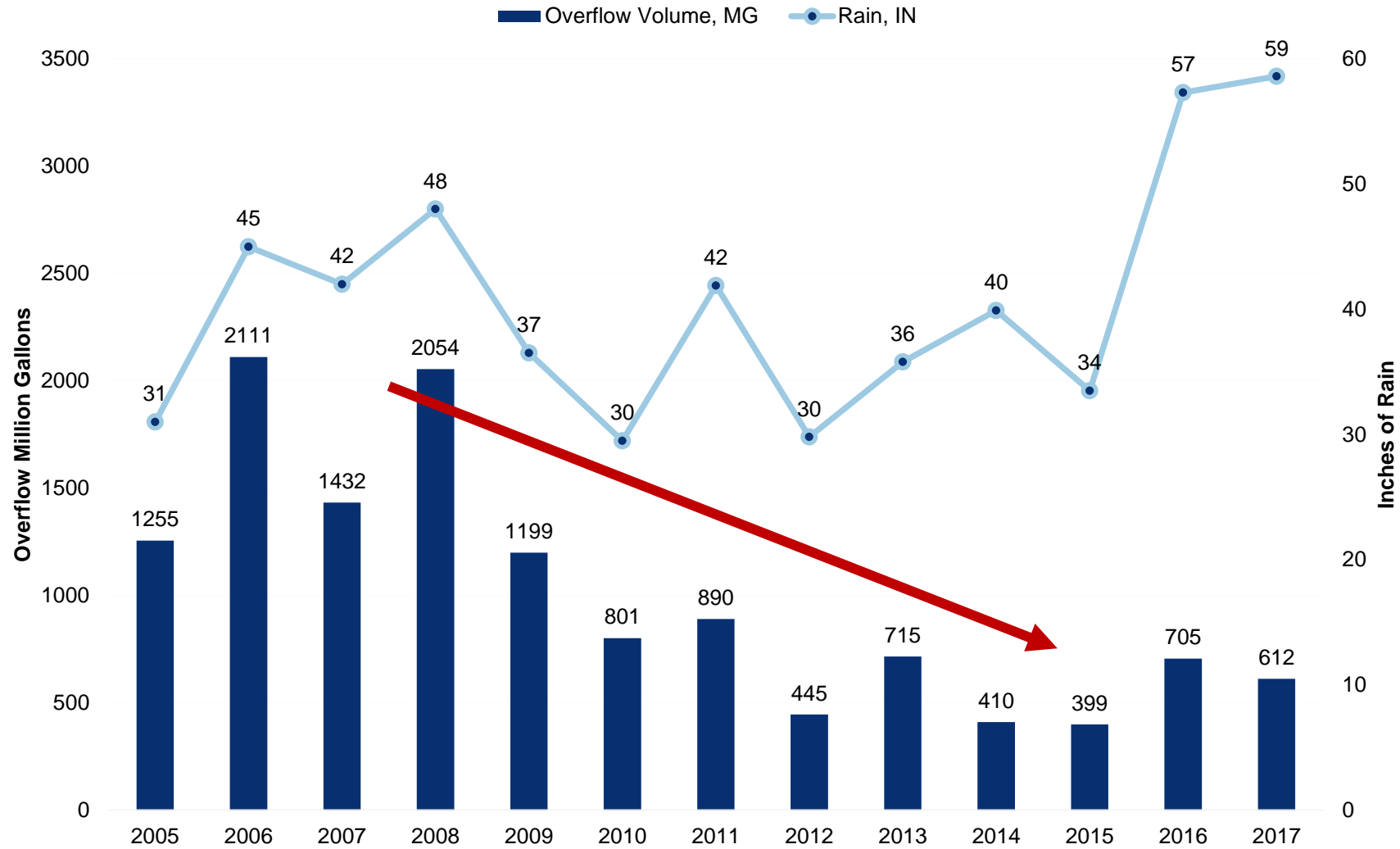
Data Collection Software
Database & Data Analytics Tools
Full SCADA Integration



Future-casting



Driving impact



Thank you

Questions or comments?

Albert Cho

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QUESTIONS & ANSWERS



Resources

- Insurance, Bond Ratings and Climate Risk: A Primer for Water Utilities: www.amwa.net



Upcoming Webinars

Part 3: February 26, 2020 | 2:00 PM - 3:30 PM ET

Part 4: June 3, 2020 | 2:00 PM - 3:30 PM ET

Learn more by visiting nacwa.org/19rw

