



AMERICAN WATER

Innovations in Desalination, Water Reuse, and Emerging Contaminants at American Water

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Technology and Innovation

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American Water – History and Operations



- Heritage dates back to 1886
- Largest U.S. water and wastewater services provider
- Serves an estimated 15 million people in more than 1,500 communities
- Approximately 6,400 employees
- Treat and deliver more than 1 Billion Gallons /Day

Issues facing American Water systems are representative of those impacting water industry as a whole

Addressing the Water Community's Greatest Challenges

- Water Supply
- Water Quality
- Infrastructure
- Customer Expectations



ABOUT US NEWS KEY ISSUES RESEARCH CONSUMER GUIDES SUPPORT OUR WORK EWG VERIFIED

**JUST RELEASED:
EWG'S NATIONAL TAP
WATER DATABASE**

What's in your water? Is it harmful? Search your zip code and find out.

The Latest From EWG

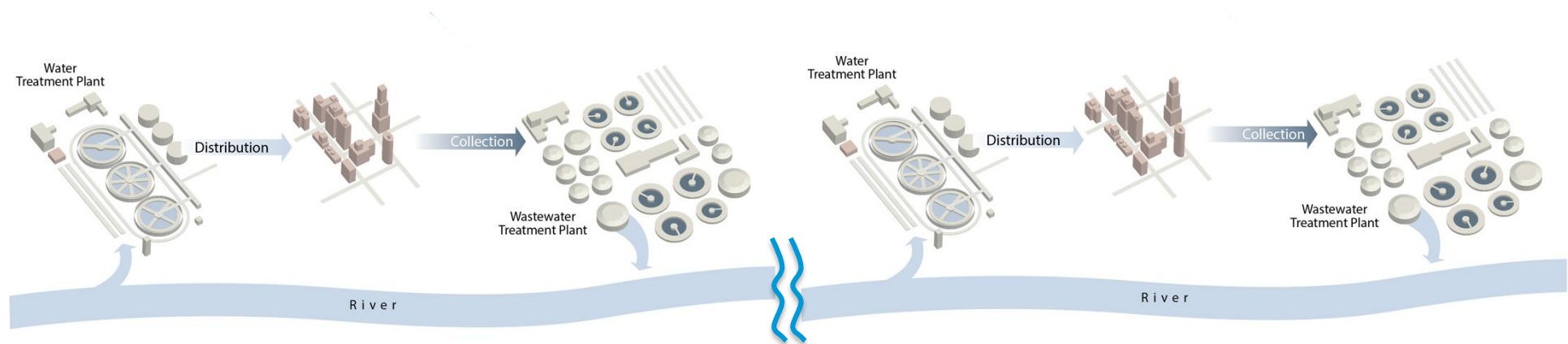
Rise in Imports of Personal Care Products May Pose Health Risk
AUGUST 2, 2017
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Using EWG's Water Filter Buying Guide
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Disinfectant Mix in Cleaning Products Linked to Birth Defects in Lab Animals
JULY 31, 2017
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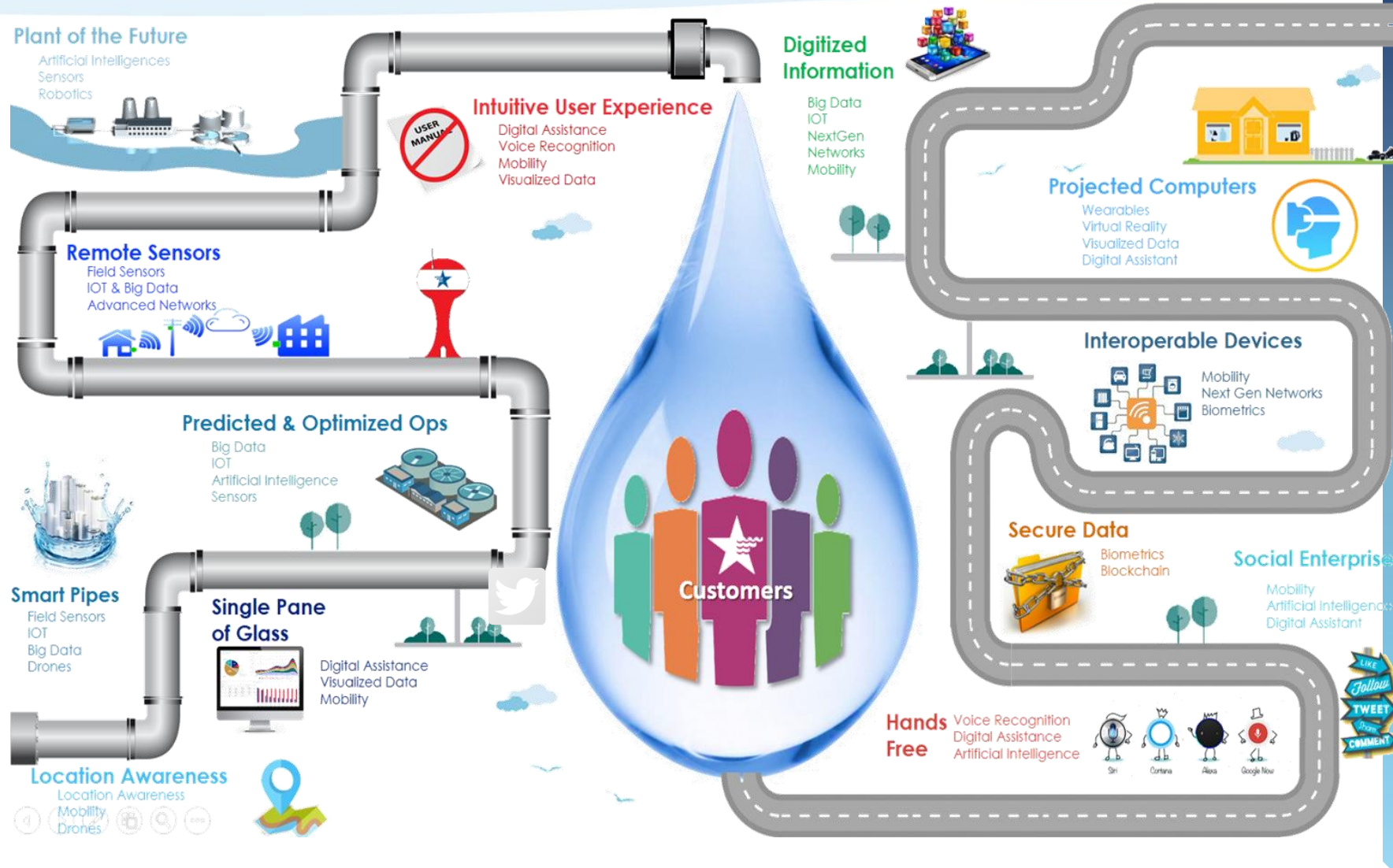
We Produce Innovations to Meet the Challenges of Now and the Future



Clean, Safe, Reliable Water for a Sustainable Future

DIGITAL ENTERPRISE

DIGITAL LIFESTYLE



Commercial Technologies

Consumer Technologies

- GIS
- Voice Recognition
- IoT
- Internet of Things
- A.I.
- Big Data
- Visualized Data
- Mobile Device

- Digital Assistant
- Blockchain
- Wearables
- Social
- Mobile Device
- Voice Recognition
- Biometrics

Distribution

- Solutions for pipe renewal (polymer coatings) to combat aging infrastructure
- Improved infrastructure longevity through advanced pipe replacement materials

- UV Drone technology to disinfect pipes after repairs and installation without chemicals and residuals

Treatment

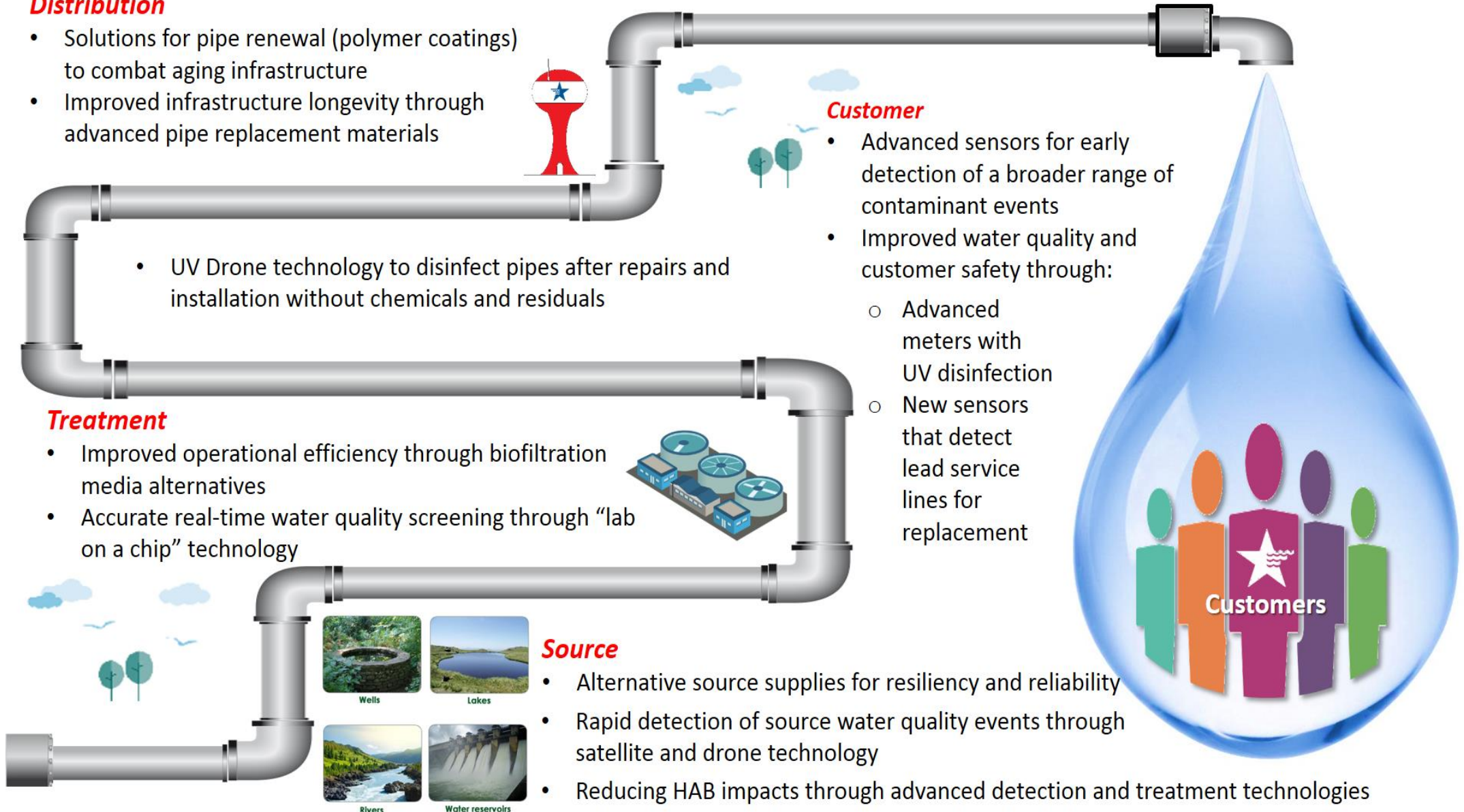
- Improved operational efficiency through biofiltration media alternatives
- Accurate real-time water quality screening through “lab on a chip” technology

Source

- Alternative source supplies for resiliency and reliability
- Rapid detection of source water quality events through satellite and drone technology
- Reducing HAB impacts through advanced detection and treatment technologies

Customer

- Advanced sensors for early detection of a broader range of contaminant events
- Improved water quality and customer safety through:
 - Advanced meters with UV disinfection
 - New sensors that detect lead service lines for replacement



2017 OUTCOMES



Contaminant Monitoring

Developed analytical methods and tested over 2,000 samples to support American Water's proactive monitoring of emerging contaminants



Public Outreach

Developed public outreach and education materials on the American Water legionella website to help customers manage water quality in buildings



Treatment Technologies

Tested new technologies for treatment of nitrate, perchlorate, chromium 6, cyanotoxins, and PFOS/PFOA

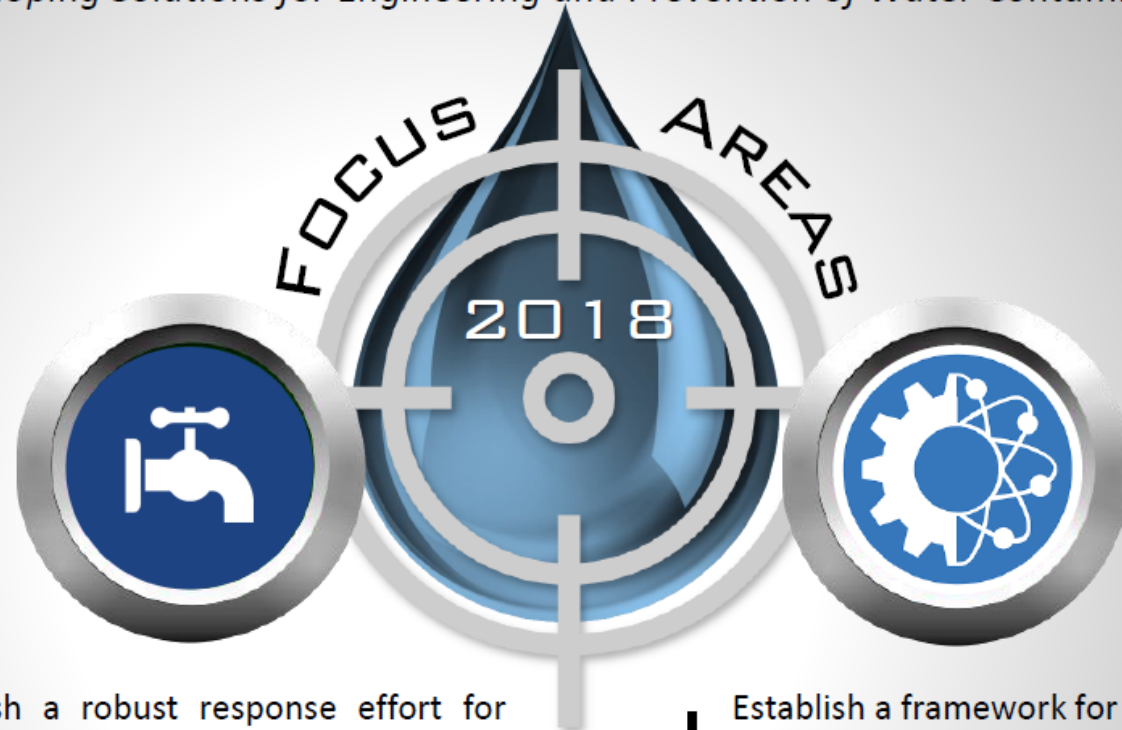


Guidance

Provided guidance & recommendations to states in technology selection and implementation for emerging contaminants

RESEARCH & DEVELOPMENT

Developing Solutions for Engineering and Prevention of Water Contamination



1

Establish a robust response effort for emergency water quality incidents through analytical instrumentation, data analytics, method development, training and support.

Develop and test advanced sensors and analytics to detect multiple priority contaminants rapidly or in near-real time
Establish capabilities to identify taste and odor compounds, then develop & implement strategies to prevent taste and odor events

2

Establish a framework for tight integration of R&D activities to support state and corporate engineering optimization efforts

Identify key challenges that impact operational performance
Develop treatment process solutions and provide support/training

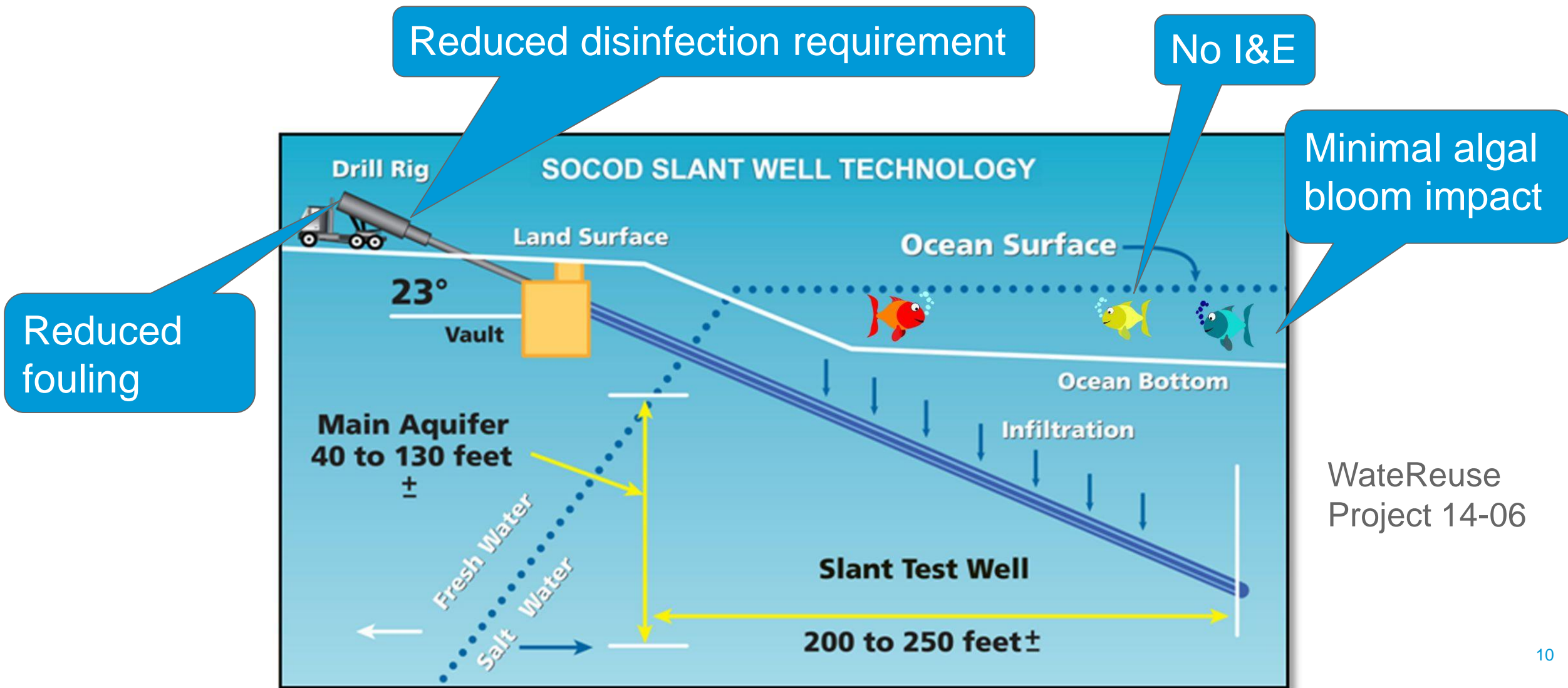
Example Innovations in Water and Water Reuse

Open Ocean Intakes Are of Concern Because of Potential Impact to Wildlife and Susceptibility to Algal Blooms



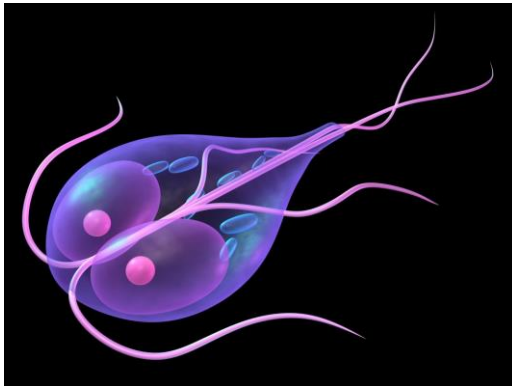
- Algal blooms
- Impingement and entrainment (I&E)
- Pumping 45.1 mgd => 10.2 million fish larvae entrained/yr (W. Basin; Tenera Environmental)
- Subsurface intakes required where feasible (CA Ocean Plan, 2015)

Slant Wells Provide Resiliency, Disinfection, and Minimizes I&E



Supporting Safety and Reliability of Potable Reuse: Research Grants

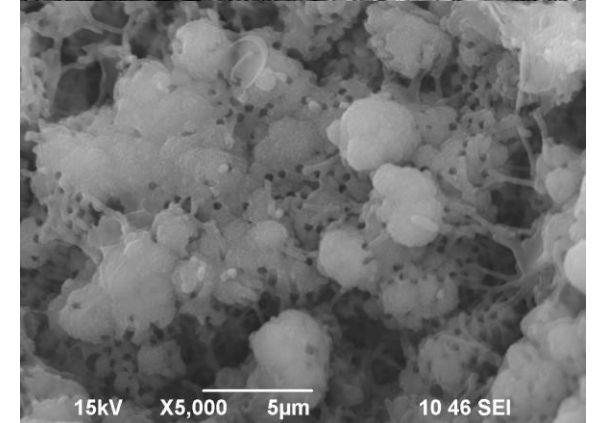
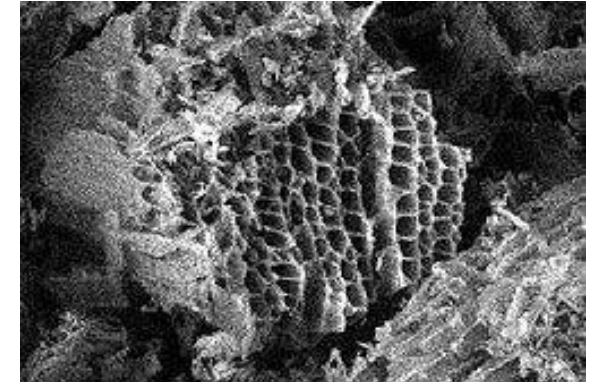
- Evaluation of Pathogen Reduction



- Ozone-Biofiltration for Contaminant Removal

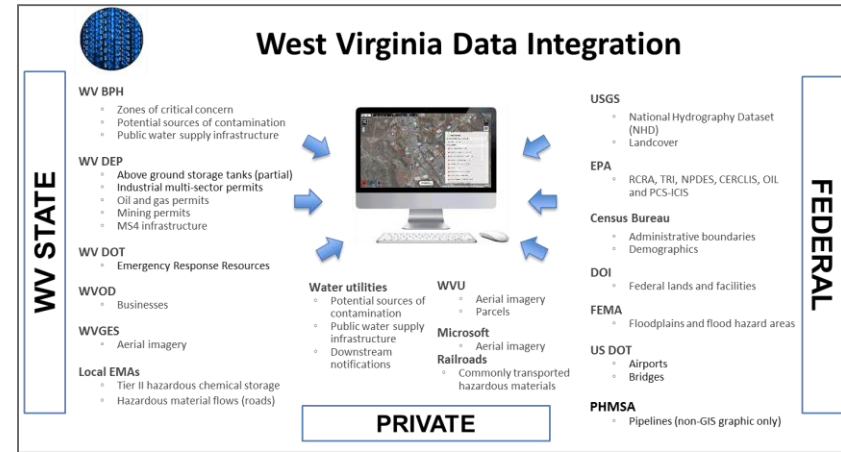


- Activated Carbon and Biofiltration for Regulated and Emerging DBP Control



Source Protection Through Inventory, Sensors, and Response Planning

Define critical area

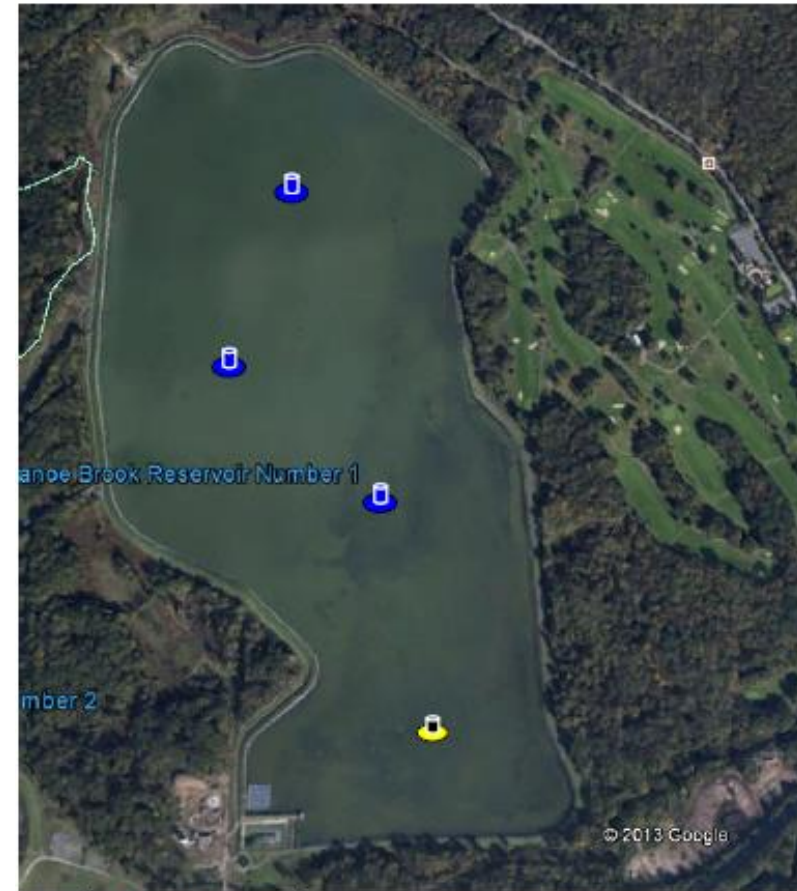


Identify potential sources of pollution

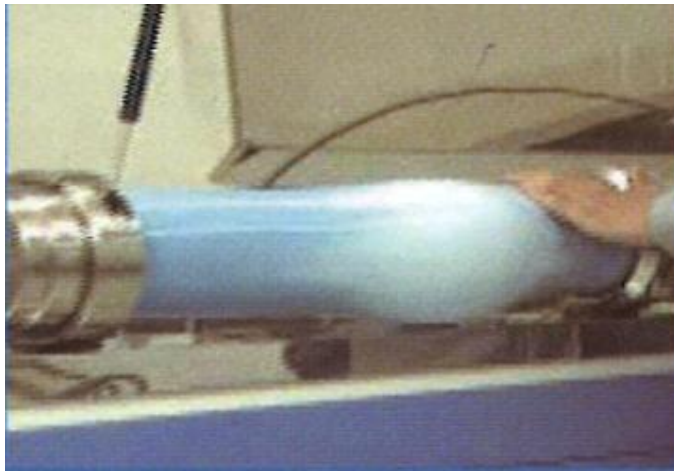
Employ early warning systems



Algae/Cyanobacteria Control with Ultrasonic Systems



iPVC Pipe for water main replacement offers greater resiliency for water main replacement





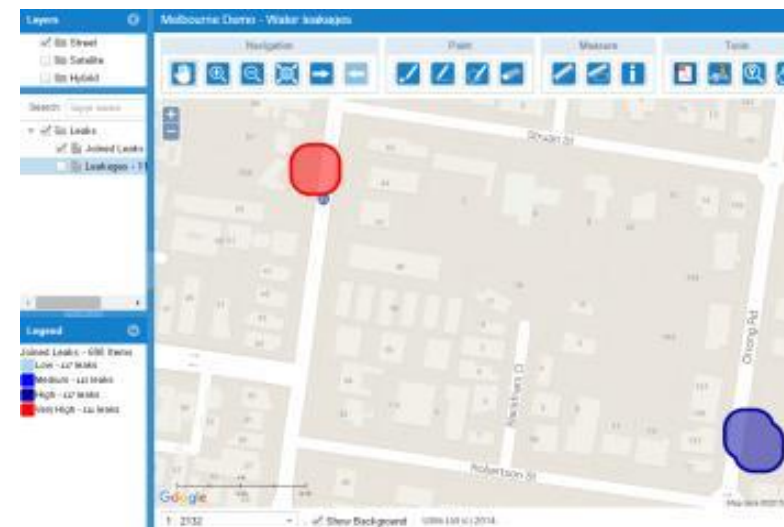
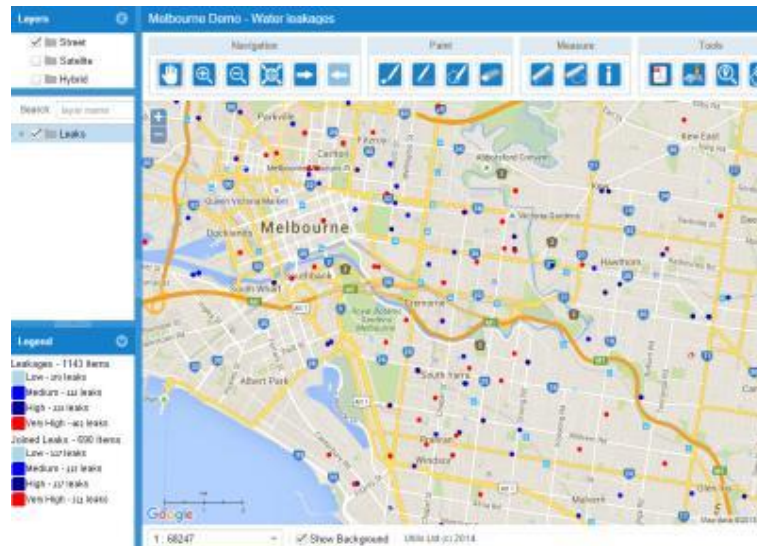
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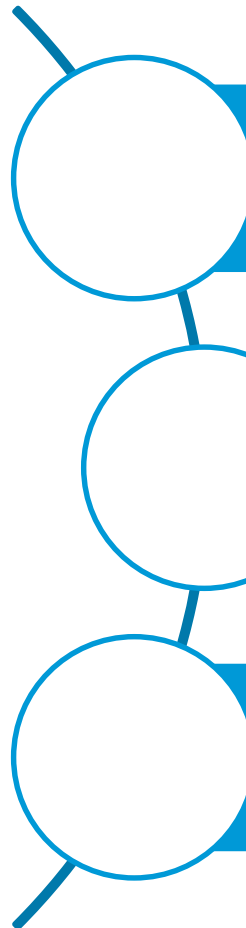
Leaks can be detected from space

Utilis identifies fresh water leaks by analyzing satellite imagery

IMAGINE  H₂O
WINNER



Summary

- 
- The water community is at an inflection point with respect to innovation and digital technology
 - Strong research teams bridge community needs with cutting edge solutions
 - American Water is leading the way in providing solutions for desalination, reuse, contaminants, and distribution



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