



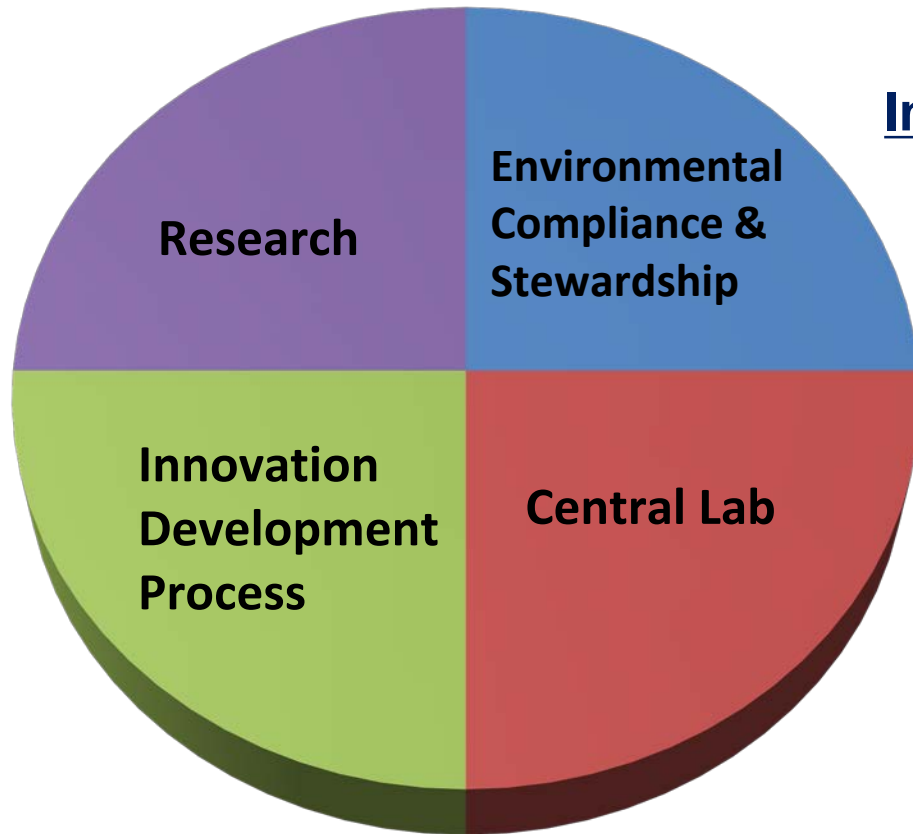
AMERICAN WATER

Environmental Roundtable: Solutions through Innovation

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INNOVATION AND ENVIRONMENTAL STEWARDSHIP



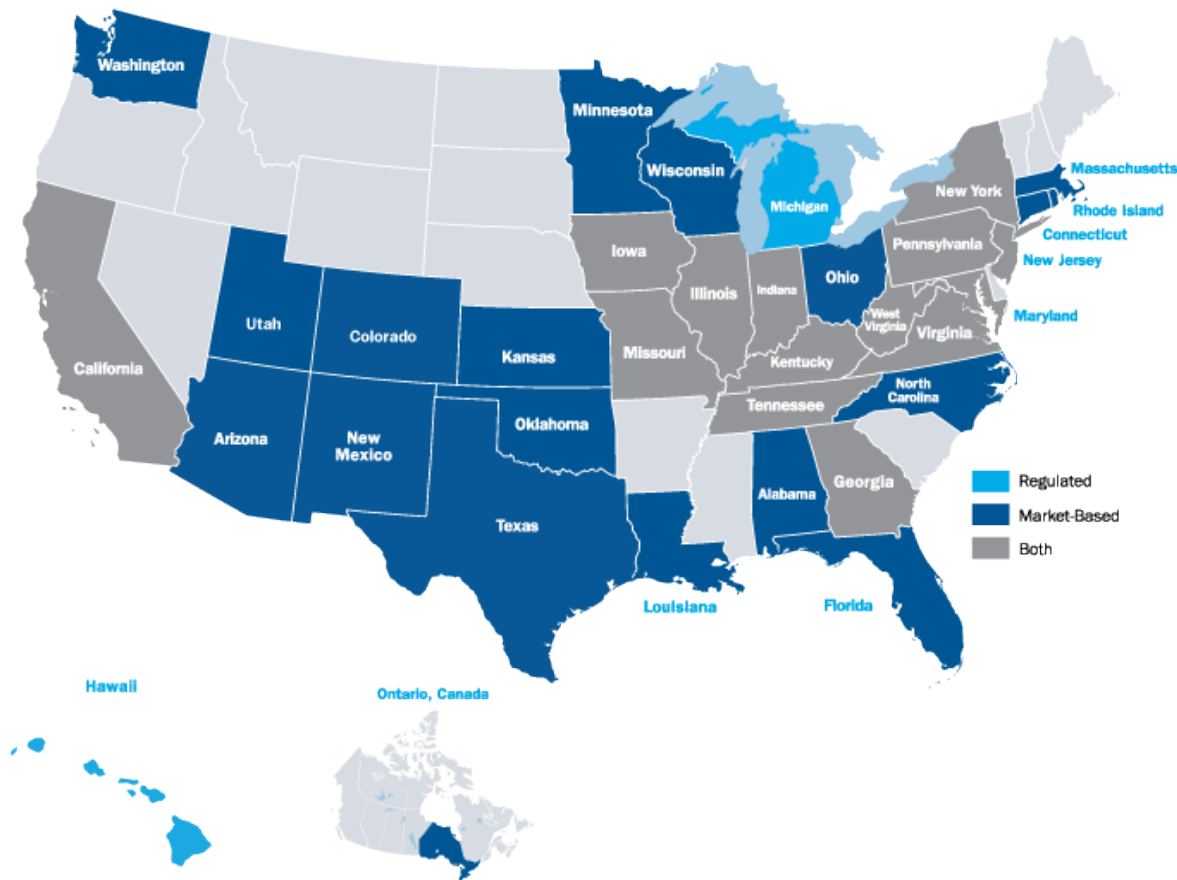
Interdisciplinary team of 40 people:

- Engineers
- Chemists
- Microbiologist
- Environmental Scientists

Objectives:

- Address emerging water quality or regulatory issues
- Evaluate & recommend new technology to enhance operations
- Support operations with technical, functional expertise
- Support Business Development
- Enhance Corporate brand

Our “Laboratory”



American Water is the largest water and wastewater services provider in North America, headquartered in Voorhees, NJ.

American Water provide services to approximately 15 million people in more than 1,600 communities in more than 40 states and in Canada; and employs about 6,500 water professionals.

American Water owns or operates over 300 drinking water systems and 200 wastewater facilities.

We treat and deliver over a billion gallons of water daily

The company conducts over one million water quality tests each year for over 100 regulated parameters, and up to 50 types of water-related tests each day.

Challenges to the Water Industry

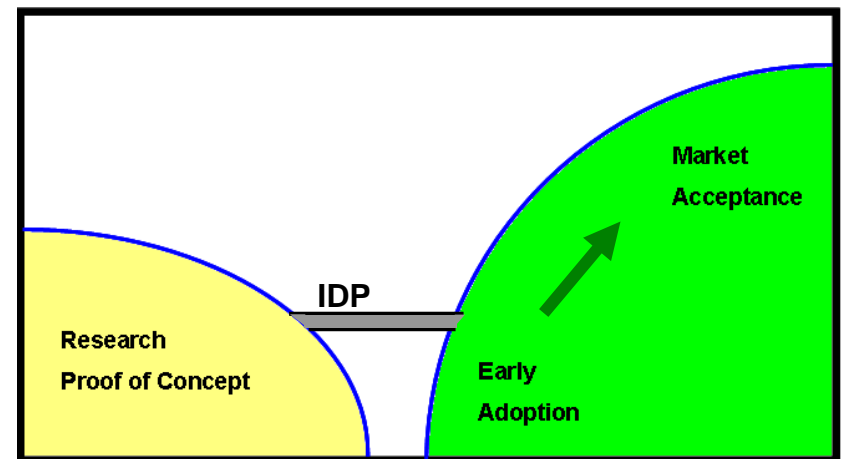
- Water scarcity
- Aging infrastructure
- Emerging contaminants
- Financially strapped municipalities
- Operational efficiency
- New environmental regulations
- Advanced treatment technologies
- Energy Efficiency / Climate change
- Environmental concerns/stewardship
- Security
- Customer satisfaction
- Automation
- & more

Need new
innovations to
address these
challenges



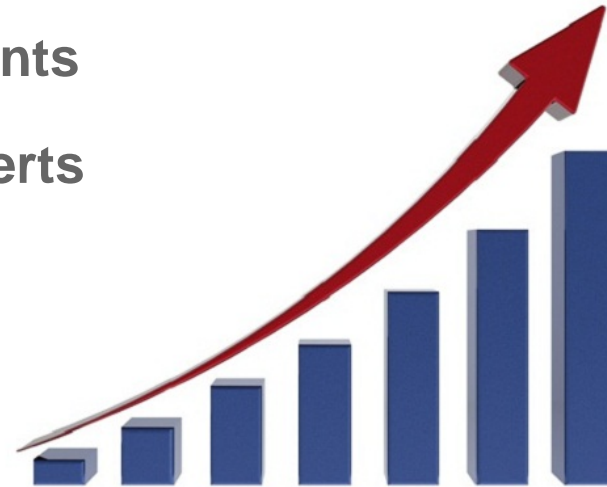
What is the “Innovation Development Process”?

- A way to leverage American Water’s research and market position to build customer and shareholder value through innovation
- A mechanism to leverage our nationwide physical assets to test and develop new opportunities
- A process to differentiate American Water from the rest of the industry
- A way to drive efficiencies (e.g., capital investment to reduce opex) into American Water and grow the business



The “Innovation Development Process”

1. Uses a Stage Gate process to screen innovations
2. Execute non-disclosure agreements
3. Technical screen by internal experts
4. Initial financial screen
5. Validation Study
6. Business case development
7. Purchase agreement
8. Marketing agreement



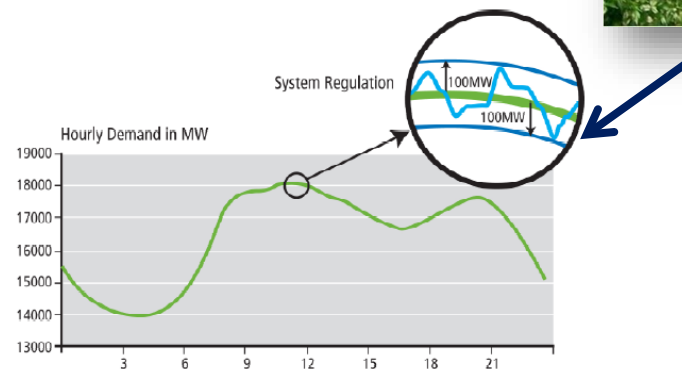
Screening Questions

1. Does it address a pressing need?
2. Is the solution scalable?
3. Could it reduce cost?
4. Is it unique or competitive?

Climate Change

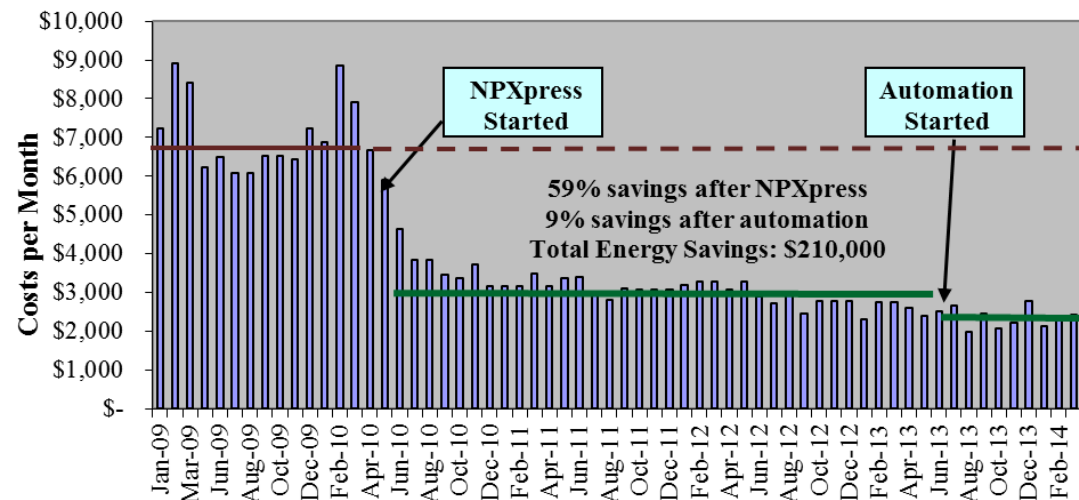
Smart Grid

- ENBALA Power Network interfaces the electric grid with SCADA systems
- Increases or decreases power use to provide grid balance
- Seamless to operations
- Generates revenue using existing assets
- Installed in PA and NJ



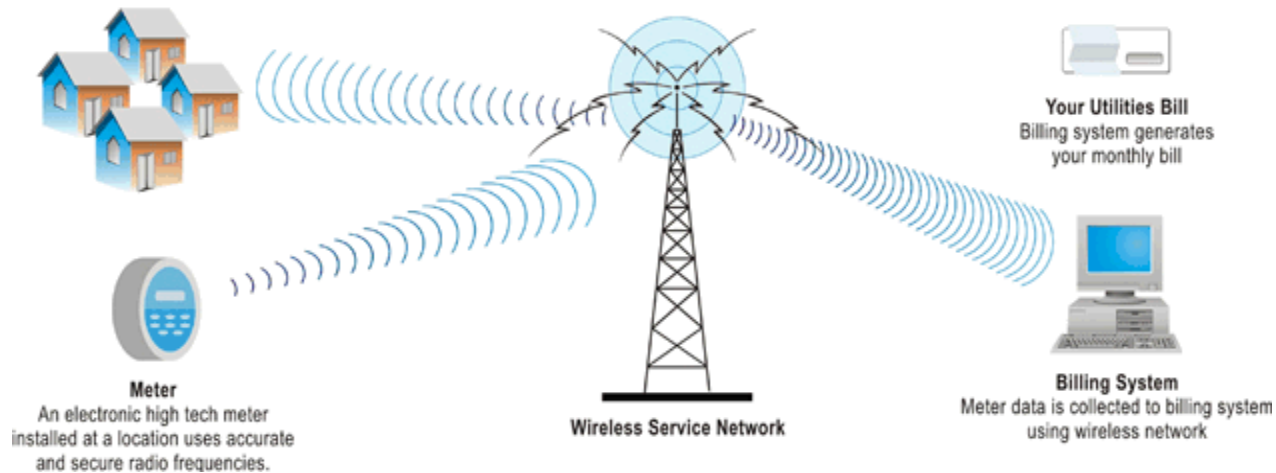
Energy Efficient Wastewater Treatment

- NPXpress is a unique nitrogen and phosphorous removal wastewater treatment that has been patented by American Water
- Significantly reduces the energy requirements to treat wastewater
- Reduce/eliminate the amount of additional carbon required for denitrification
- Reduces chemical requirements for phosphorous removal
- Testing ongoing at 7 sites. Projected <2 year payback
- Initial 6 sites in NJ averaging 35% energy reduction, over \$400,000 in accumulated savings over a three year period - \$0.57/m³ operational cost savings



Water Resource Management

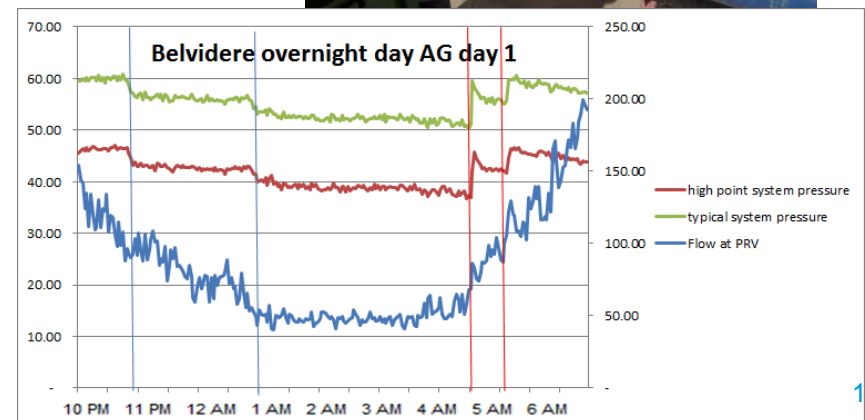
Smart Metering Systems



- Consolidation of data from 3.1 million water meters
- Commoditization of meters
- Reduction in acquisition costs
- Data analytics for stopped meters, continuous running meters, backflow
- Improved customer service
- Integrated leak detection

Smart Distribution Systems

- American Water with Israeli partner Stream Control was selected by the BIRD Foundation to validate a technology for pressure management
- Turns “dumb” pressure reducing valves into “smart” devices
- Pressure management reduces leakage, reduces main breaks, prolongs asset life
- Automatically adjusts pressure with changes in flow
- Will be evaluated at five locations in NJ, MO, WV, PA, and CA
- Validate the technology and non-revenue water savings

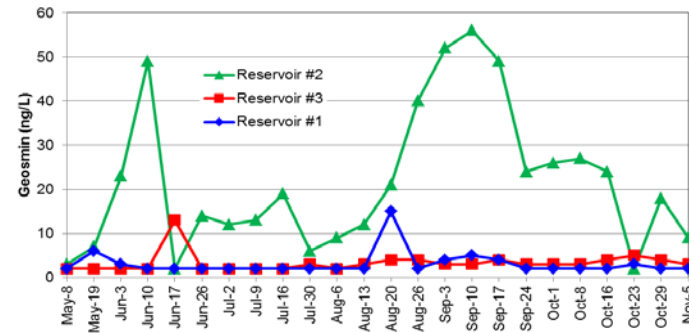
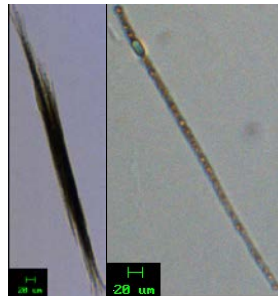


Water Quality

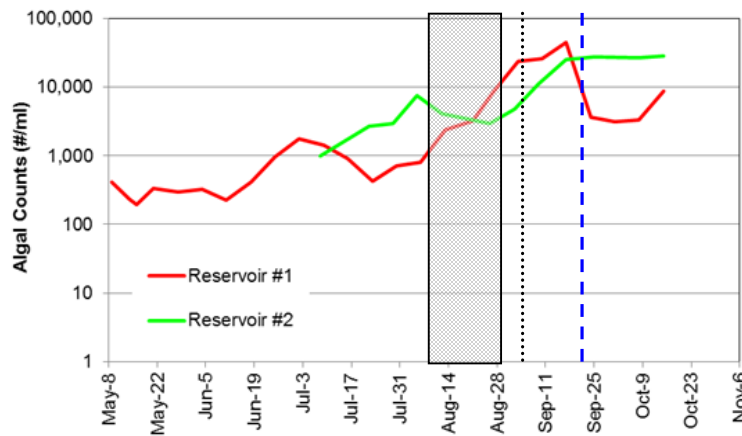
Smart Reservoir Management

Installed four LG Sonic MPC buoys in Reservoir #1 May 2014

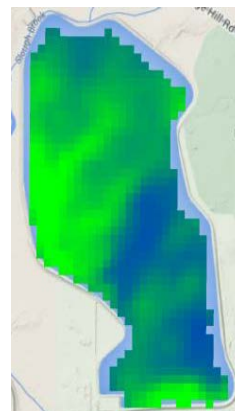
- Solar powered buoys have on-board monitors to measure algal pigments, DO, pH, Redox, turbidity
- Adjustable ultrasonic frequency to target different algae



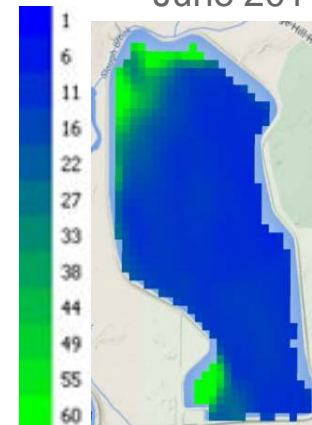
- ✓ OPEX savings of \$87,800.
- ✓ The Four LG buoys cost \$160,000
- ✓ Simple payback of 1.8 years



June 2013

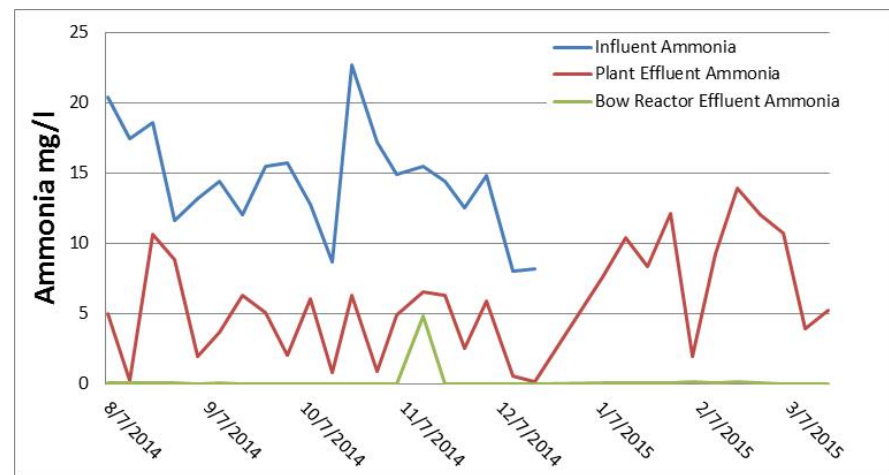
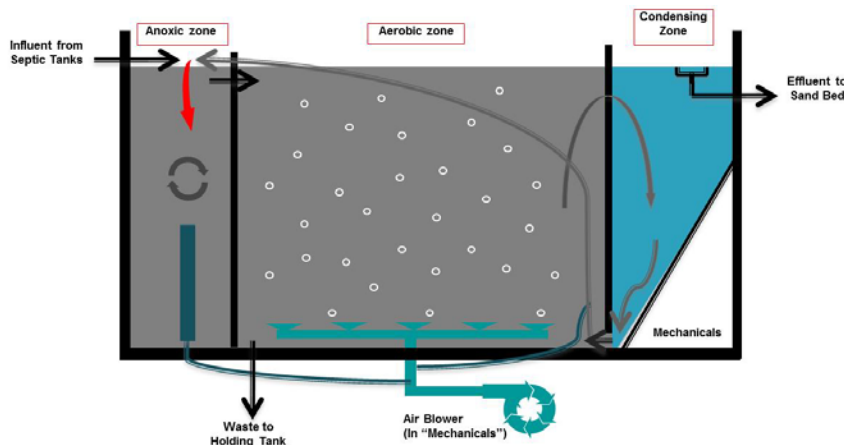


June 2014



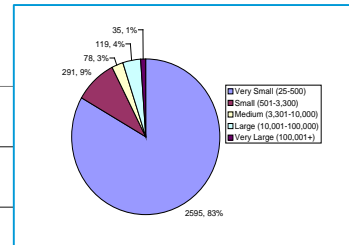
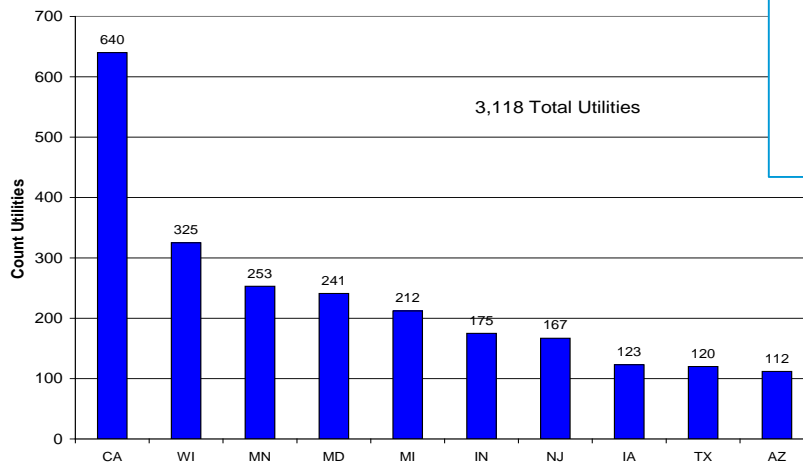
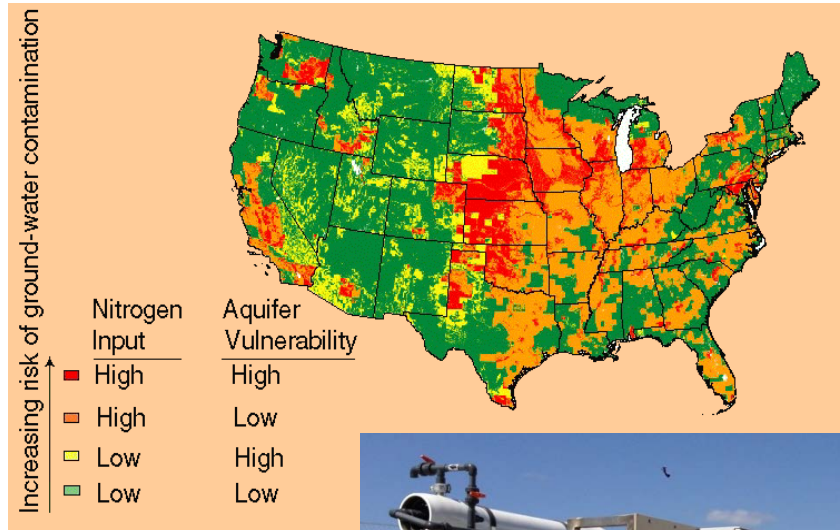
Efficient Small System Wastewater

- Small system septic plant unable to meet new ammonia discharge limits
- Ryan's Lake Subdivision Wastewater Treatment Plant, New Bloomfield, MO serves <500 people
- The Bow Reactor (Rolla, Missouri) is simple, compact, and efficient for ammonia removal
- Low cost <\$50,000



Smart Water Treatment

- WellToDo – Founded in 2012
- Licensed technology from the Technion Institute of Technology
- “Removal of Nitrate by Catalytic Reduction on Activated Carbon Cloth Supported Catalyst”



Innovation vs Invention

Invention is the *creation* of a new gadget, technology, or process

Innovation is the *application* of solutions, processes, or technologies better meet exist needs or new requirements

Innovation creates value



WE CARE ABOUT WATER. IT'S WHAT WE DO.

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