



Water Resource Technologies

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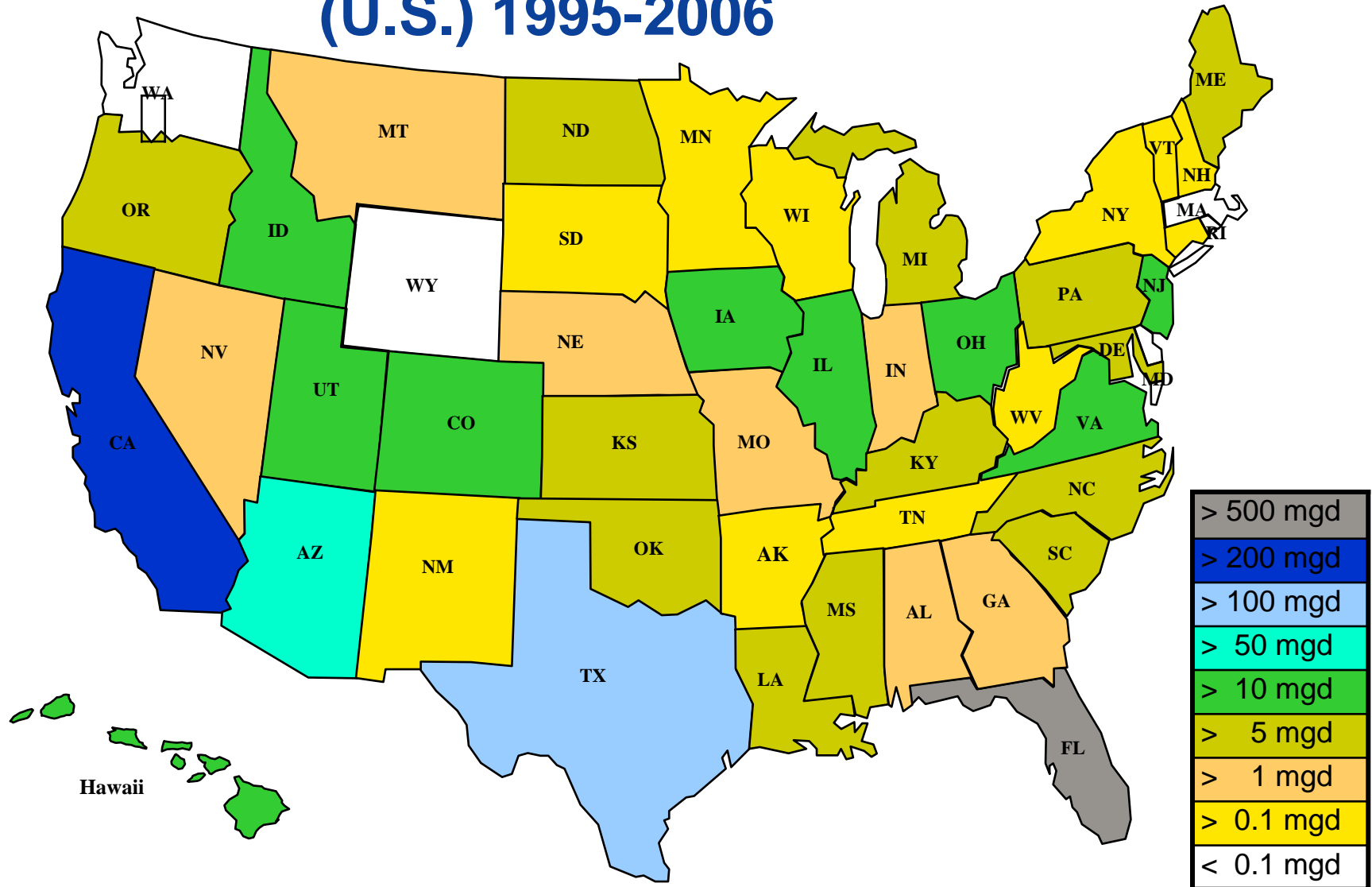
Water Resource Technologies

- Supply
 - Desalination
 - Water Reuse
- Demand
 - Leak Detection
- Impact
 - Climate Change

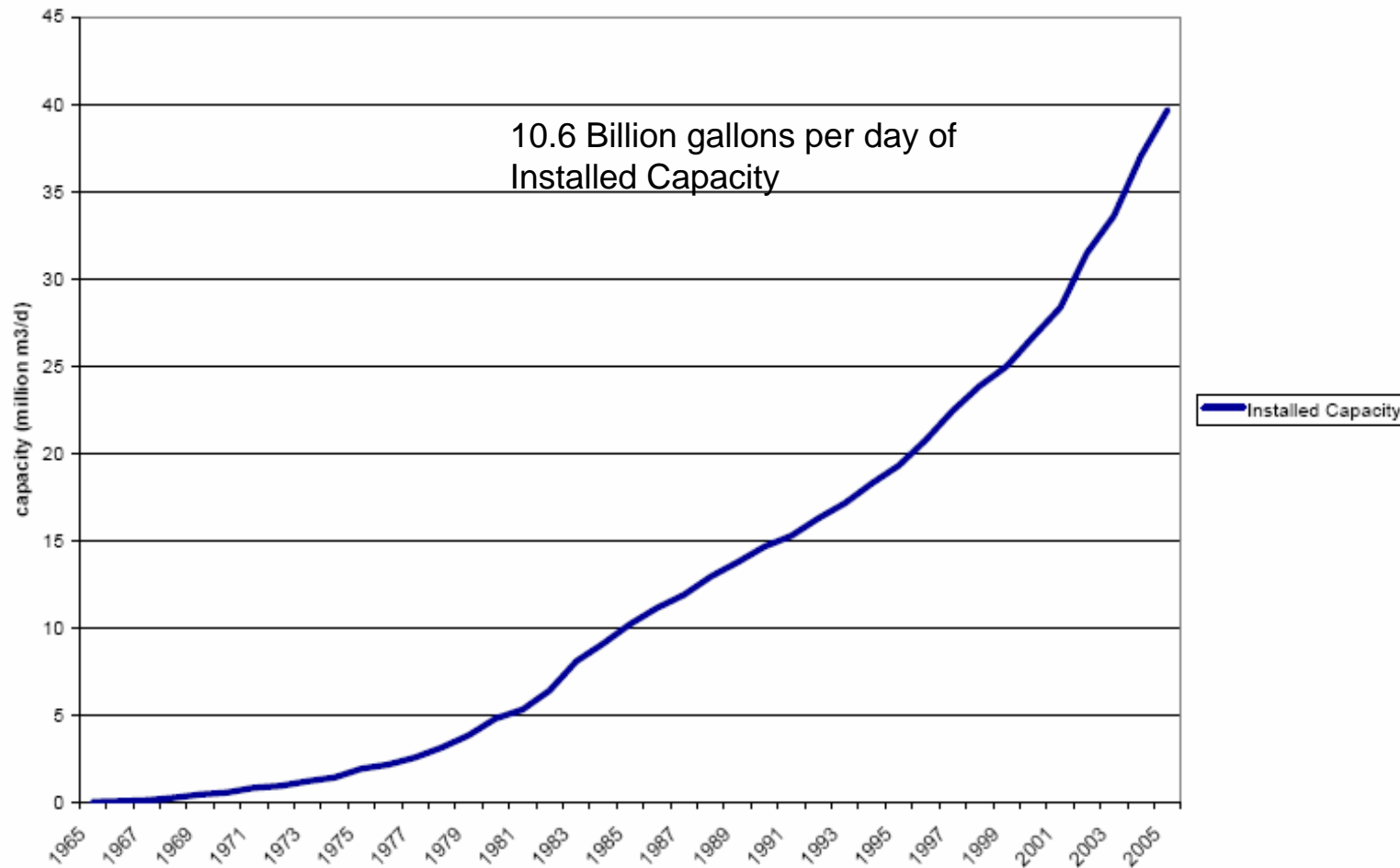
Desalination

- What is it?
- Does it work?
- Is it cost-effective?

Added Desalination Capacity by State (U.S.) 1995-2006



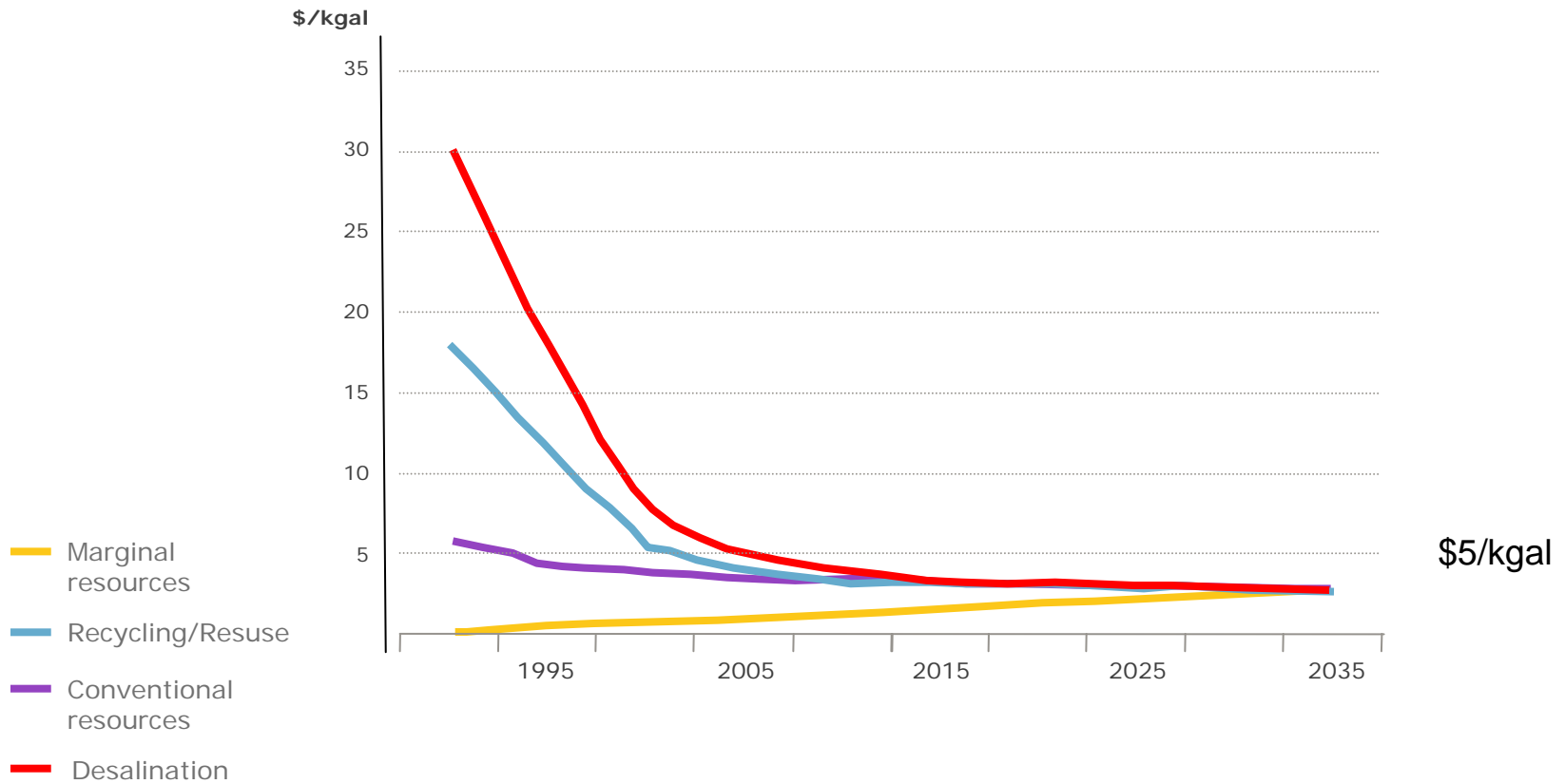
Worldwide Desalination Installed Capacity 1965-2005



Source: GWI Desal Database 10/06

Costs of Water by Source

Convergence of Costs



Source: Global Water Intelligence 10/06

Tampa Bay Seawater Desalination Plant



- Largest of its kind in U.S.
- 25 mgd design capacity
- Treatment Process
 - Disinfection
 - Chemical Feed
 - Coagulation/Flocculation
 - Sand Filtration
 - Diatomaceous Earth
 - Cartridge Filters
 - Two pass Reverse Osmosis
 - 10,032 membranes installed
 - Disinfection
 - Stabilization
- 14 megawatt power demand
- 30 - 40% energy recovery

Carlsbad Seawater Desalination Plant



- Largest North American seawater desalination project
- 54 mgd capacity (serves 300,000 residents annually)
- Treatment Process
 - Microscreens
 - UF Membranes
 - RO Membranes
 - Disinfection
 - Stabilization

Water Reuse in the U.S.

- Water reuse in the U.S. is a large and growing practice
- An estimated 1.7 billion gallons per day is reused
- Reclaimed water use on a volume basis is growing an estimated 15% per year
- In 2002, Florida reclaimed 584 mgd; California ranked a close second with 525 mgd used everyday
- Florida has an official goal of reclaiming 1 billion gallons per day by the year 2010

Types of Reuse

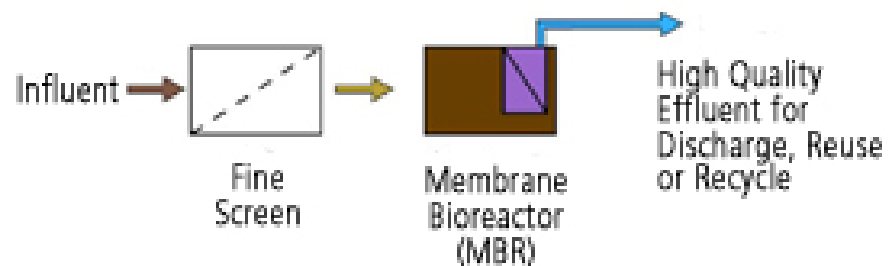
- Urban
- Industrial
- Agricultural
- Environmental/Recreational
- Groundwater Recharge

Membrane Bioreactor vs. Conventional Treatment

Conventional Multi-Step Tertiary Treatment Process



Simplified MBR Treatment Process



Membrane Bioreactor



■ Treatment

- Screens
- Biological Reactor
- Membranes

■ MBR Technology

- Compact
- Effective
- Automated

Innovative Solution: Water Reuse

Residential Apartment Complex

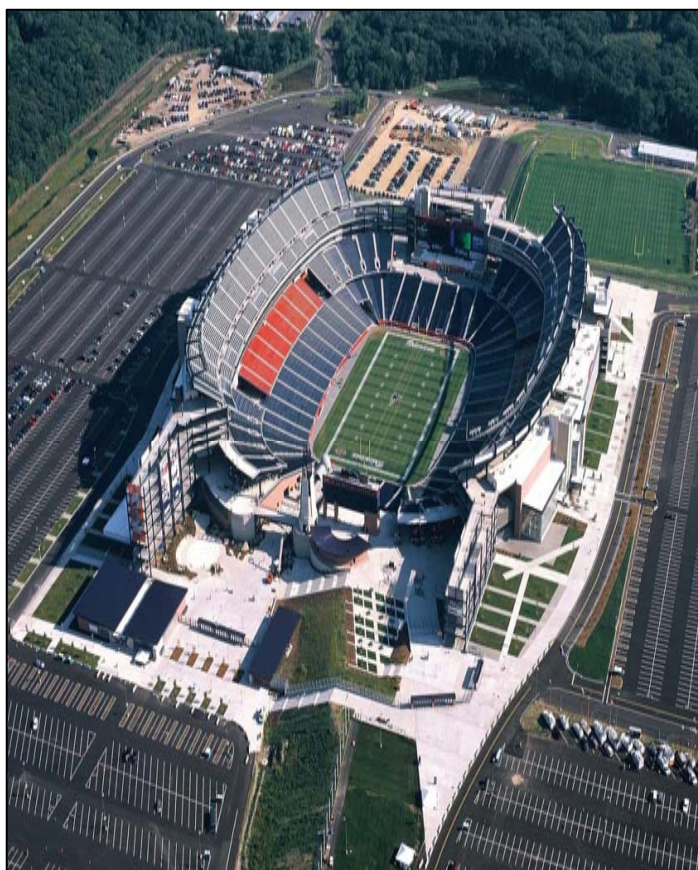


The Solaire, Battery Park City, NY

- First on-site water recycling system in the U.S.
- Multi-family residential building
- Initial service date: 2003
- Gallons per day: 25,000
- Population served: 750
- Reuse applications: toilet flushing, cooling tower make-up, irrigation
- Received LEED Gold Certification from the U.S. Green Building Council

Innovative Solution: Water Reuse

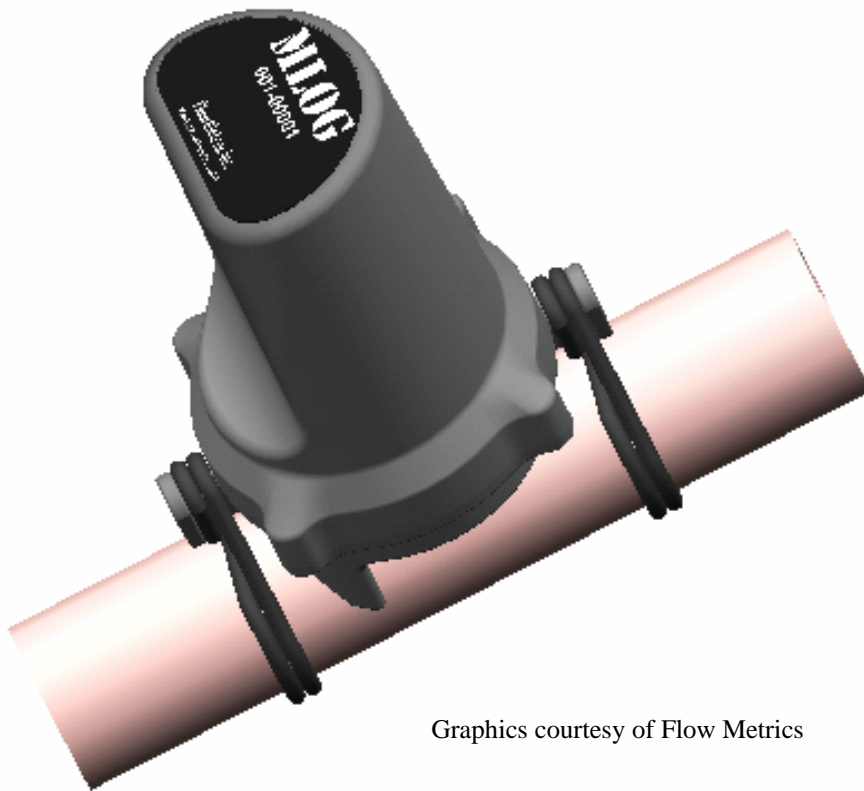
Stadium



Gillette Stadium, Foxboro, MA

- 68,000-seat stadium
- Initial service date: 2002
- Gallons per day: 250,000
- Population served: Varies
- 500,000 gallon storage tank
- Reuse applications: toilet flushing

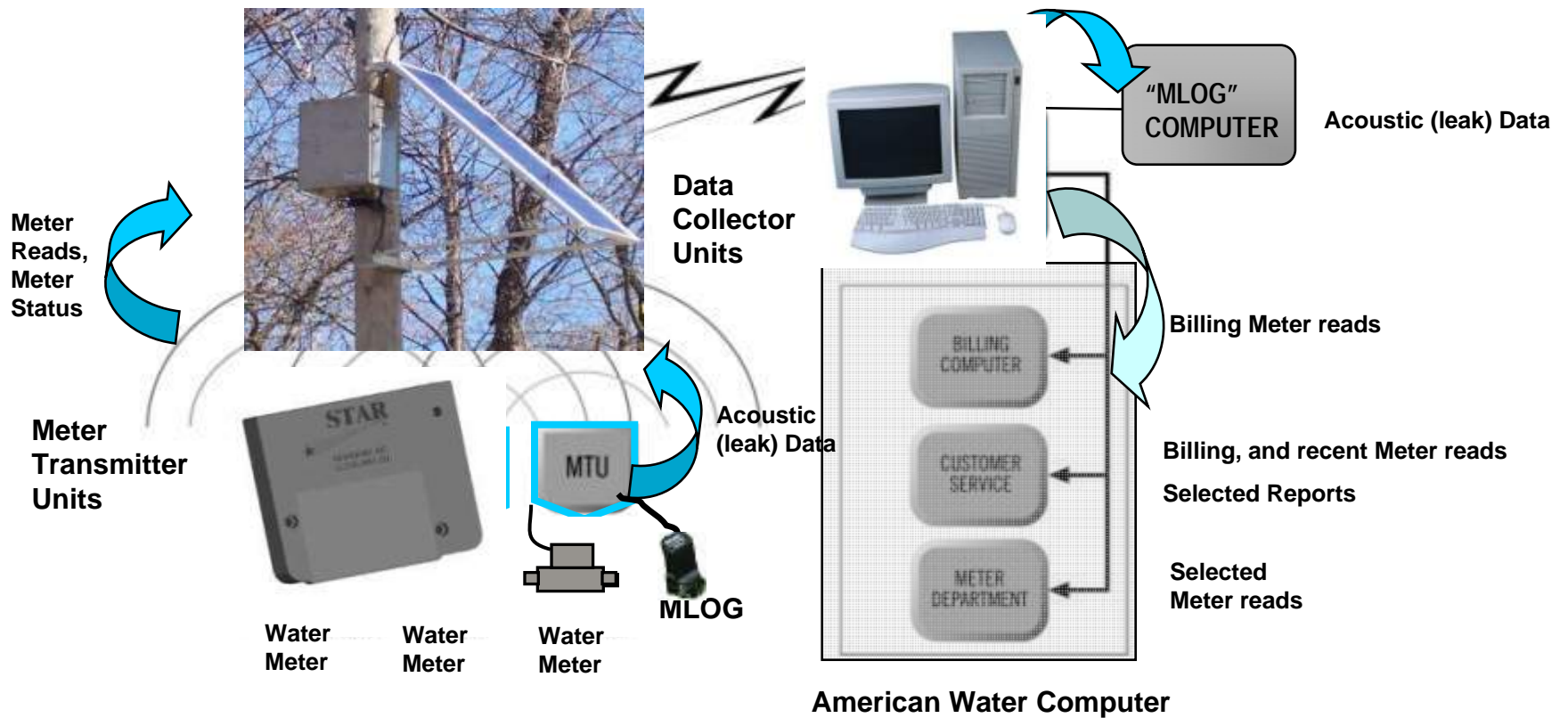
Leak Detection Acoustic Monitoring



Graphics courtesy of Flow Metrics

- Low-cost, waterproof sensor installed near a water meter
- Easily strapped to service pipe
- Maintenance-free, 10+ years (battery)
- Mobile radio or AMR communication interface

Combining AMR Fixed Network and Acoustic Monitoring



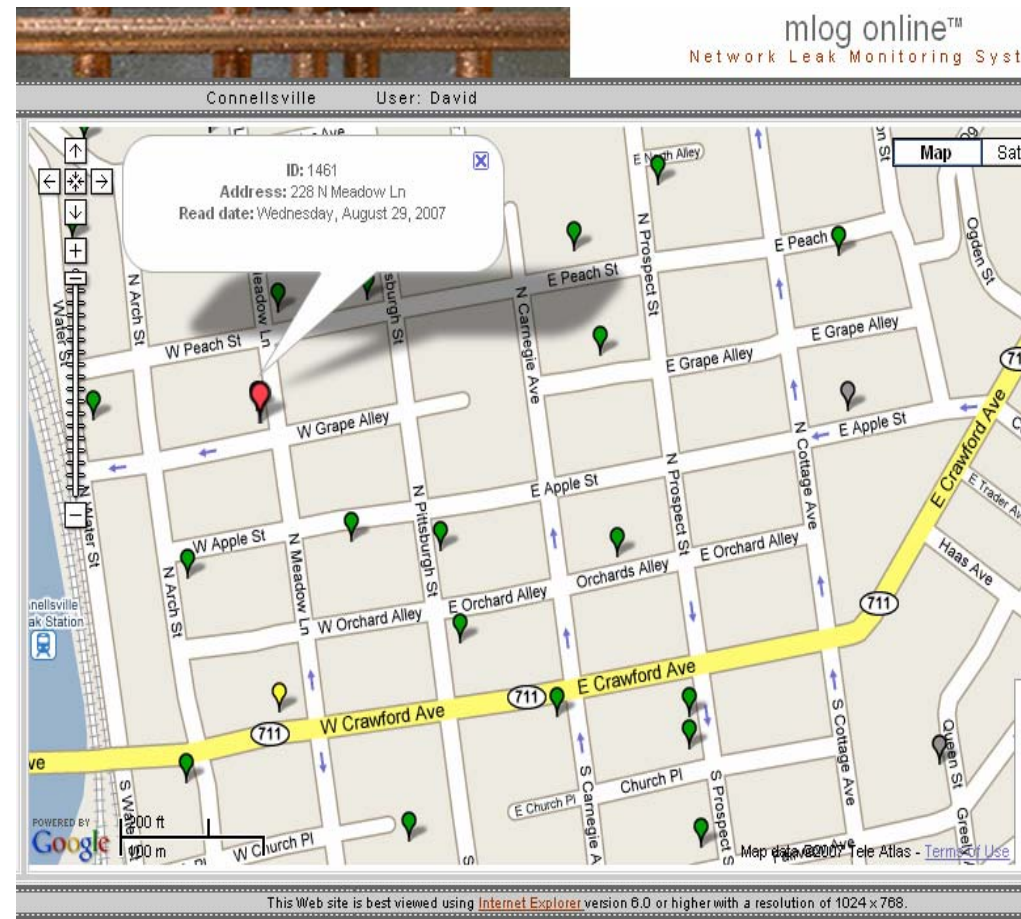
American Water Computer

Schematic courtesy of Hexagram

Innovative Solution: Leak Detection



- Daily acoustic information is captured, analyzed, and the location of leaks e-mailed to field personnel.
- Leaks are detected and repaired before they surface.
- Non-revenue water can be significantly reduced.
- Costs associated with individual leak repairs can be diminished.
- Damage to surrounding infrastructure and private property can be curtailed.



Emerging Treatment Technologies

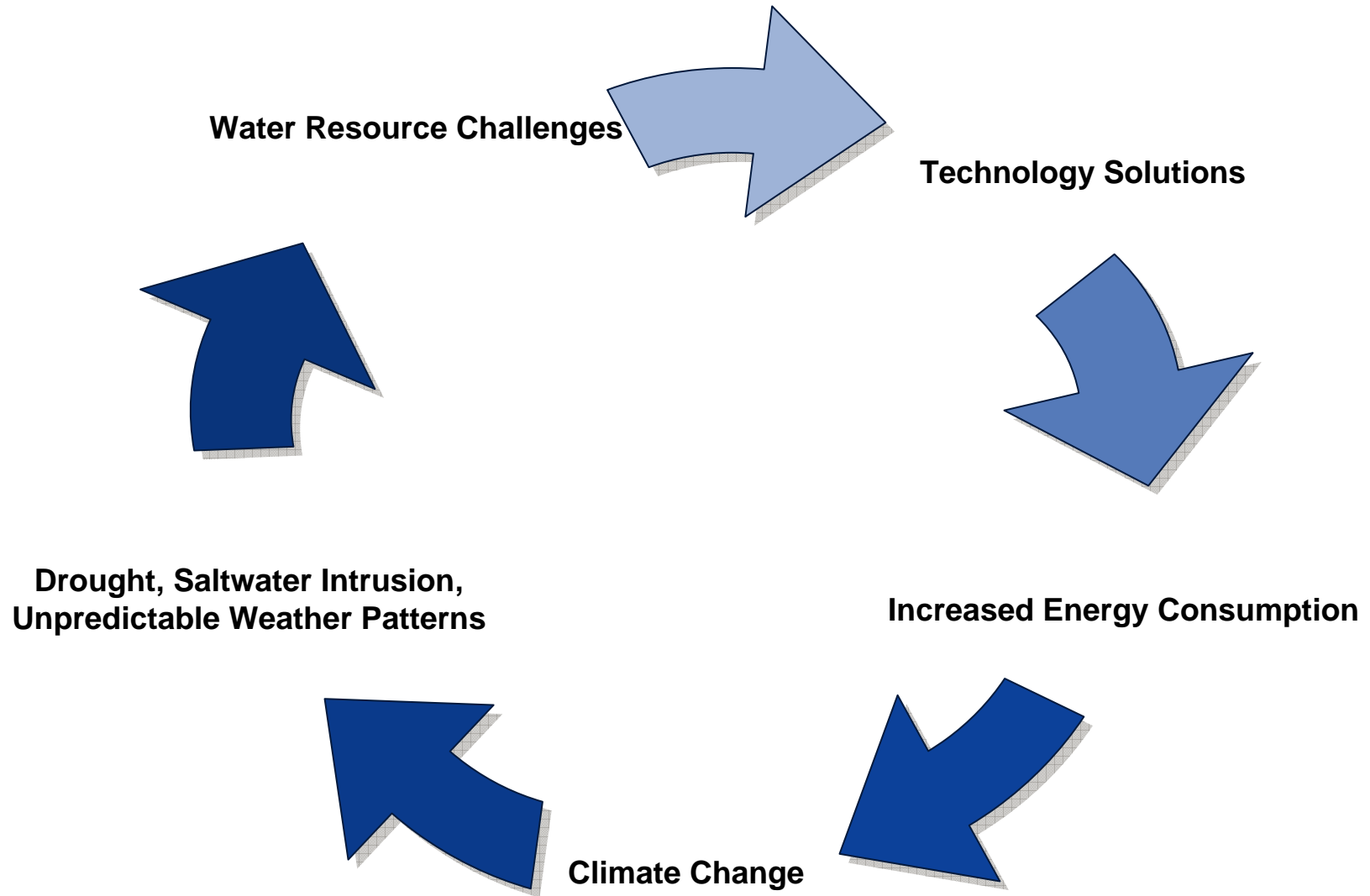
- Ozone
- UV Disinfection
- Membrane
- Desalination

Emerging Treatment Technologies

- Ozone
- UV Disinfection
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Energy Intensive

Water Resource Solution Cycle



What is Climate Leaders?

- A voluntary EPA partnership with U.S. companies to develop long-term, comprehensive climate change strategies
 - Inventory corporate GHG emissions
 - Set corporate-wide greenhouse-gas reduction goals
 - Measure and report GHG emissions to the EPA



Why did American Water Join Climate Leaders?

- Consistent with American Water's Environmental Policy and leadership ethic
- Climate change will impact future water quantity and quality
- Customer and regulator commitment of sustainability



American Water was accepted into the Climate Leaders Partnership on January 19, 2006