AccelerateH2O
Texas Water Technology Accelerator

Texas: Global Hub of Water Technology, Innovation, & Economic Competitiveness

AIChE
The Global Home of Chemical Engineers

institute for sustainability

What Sparked Our Formation

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Problem: **The scope and scale of Texas' water challenges** in various geographies, water operations, and industry settings, as well as the **fragmentation of assets and capabilities** to solve these challenges through existing and emerging technologies

Opportunity: position Texas as a significant national, global entrepreneurial and innovation water technology marketplace while **solving our near-term and long-term supply, delivery, operating issues…and then the world's similar challenges**

Solution: **"accelerate" very specific actions, engagement and leverage of water-related expertise and investment** through highly organized initiatives that are based on effective and efficient use of time and resources to resolve challenges and exploit opportunities.

Our Objectives

"…We all know that the water is an ongoing challenge for Texas

One way to meet that challenge is use the world's best technologies to make all sources of water go farther. However there are barriers that keep that from happening.

We formed the Texas Water Technology Accelerator – "AccelerateH2O" – to break through these barriers and put those technologies to work!"

Ed Archuleta, former President – El Paso Water System,
Chairman of AccelerateH2O

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Barriers and Limitations: Innovating Water in Texas

AccelerateH2O has identified several barriers and limitations requiring immediate attention to assure Texas is truly innovating water. We have also identified best practices, approaches, and opportunities to address these limitations – as noted in our agenda and activities.

- Regulatory and Rule-Making
- Economic and Business Models
- Adoption of New Solutions
- Integration into Existing Operations and Use
- Perceptions and Culture of Risk Adversity
- Proving Effectiveness and Efficiency of Products, Services
- Regional and State Water Planning Processes
- National, State and Local Rule Conflicts
- Traditional versus Innovative Engineering Practices
- Alternative Investment and Financing Tools

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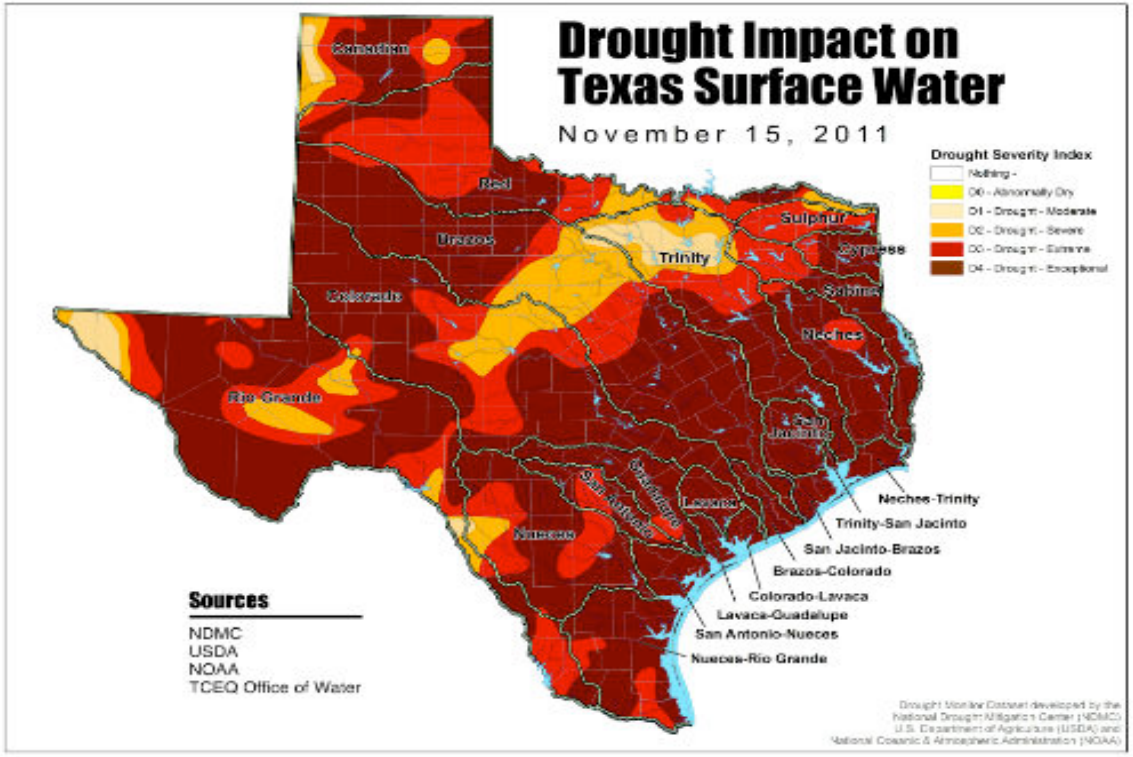
The Realities of the Texas "Water" Two-Step…



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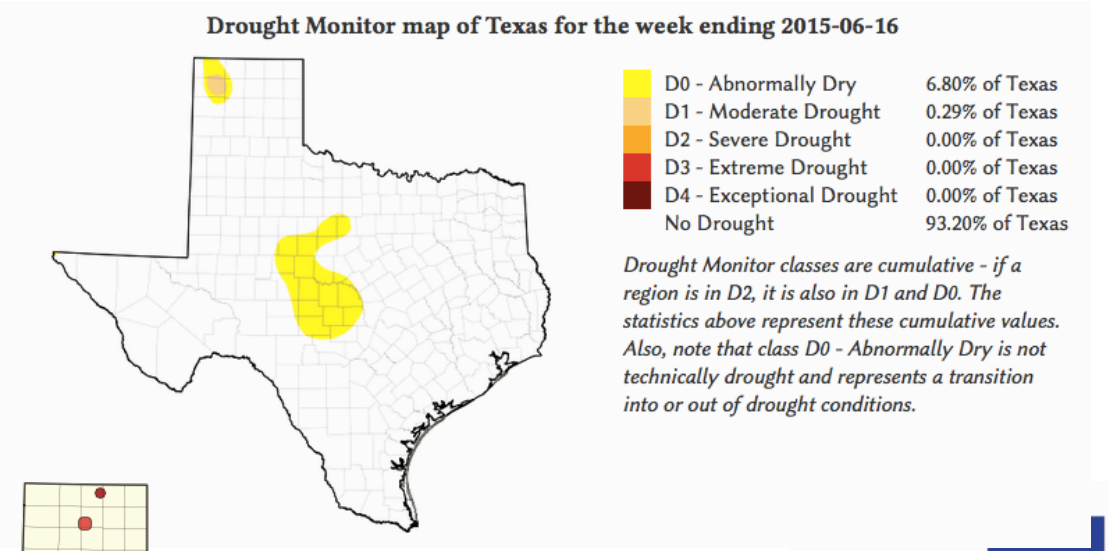
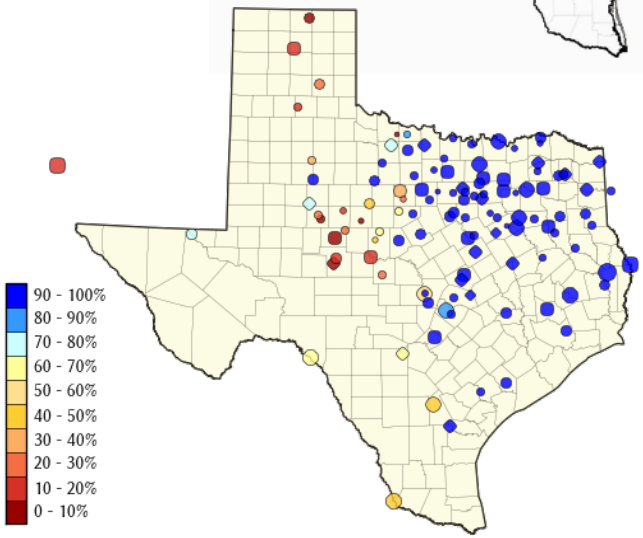
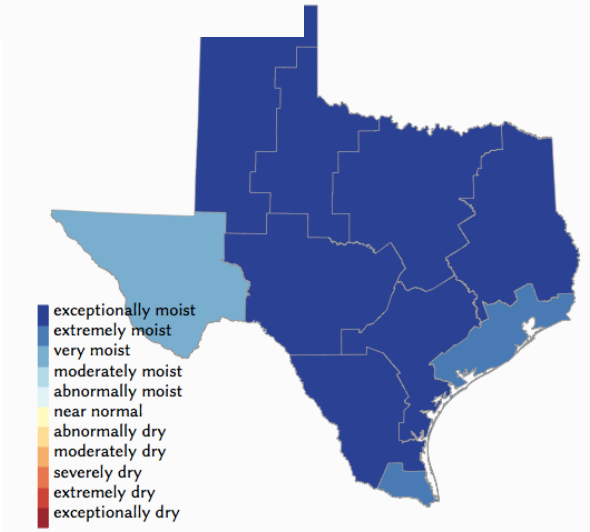
…To Flooding, Abundance Saturation…
and then Drought Again!







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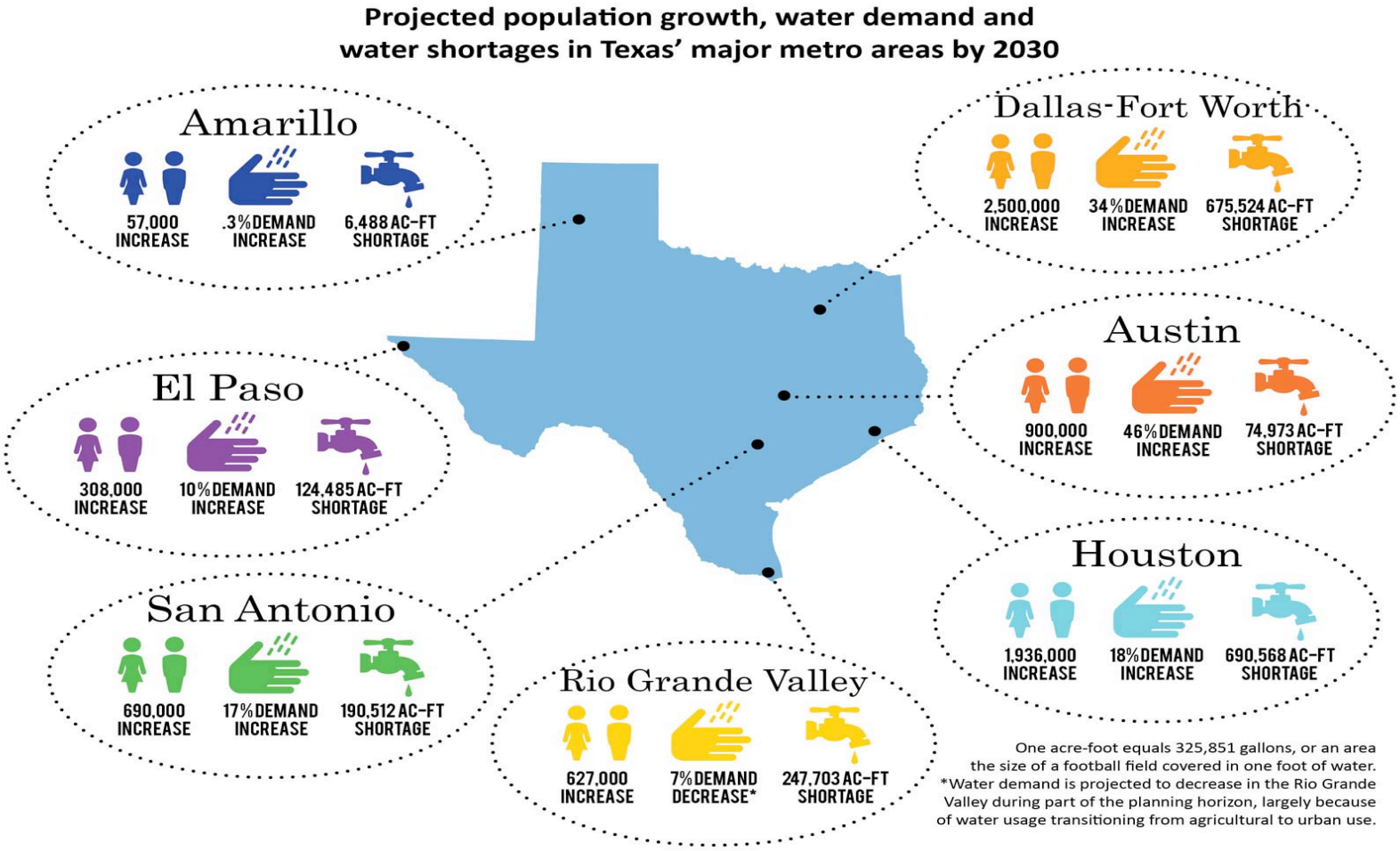
The Realities of Growth in Population, Industry, Demand for H2O



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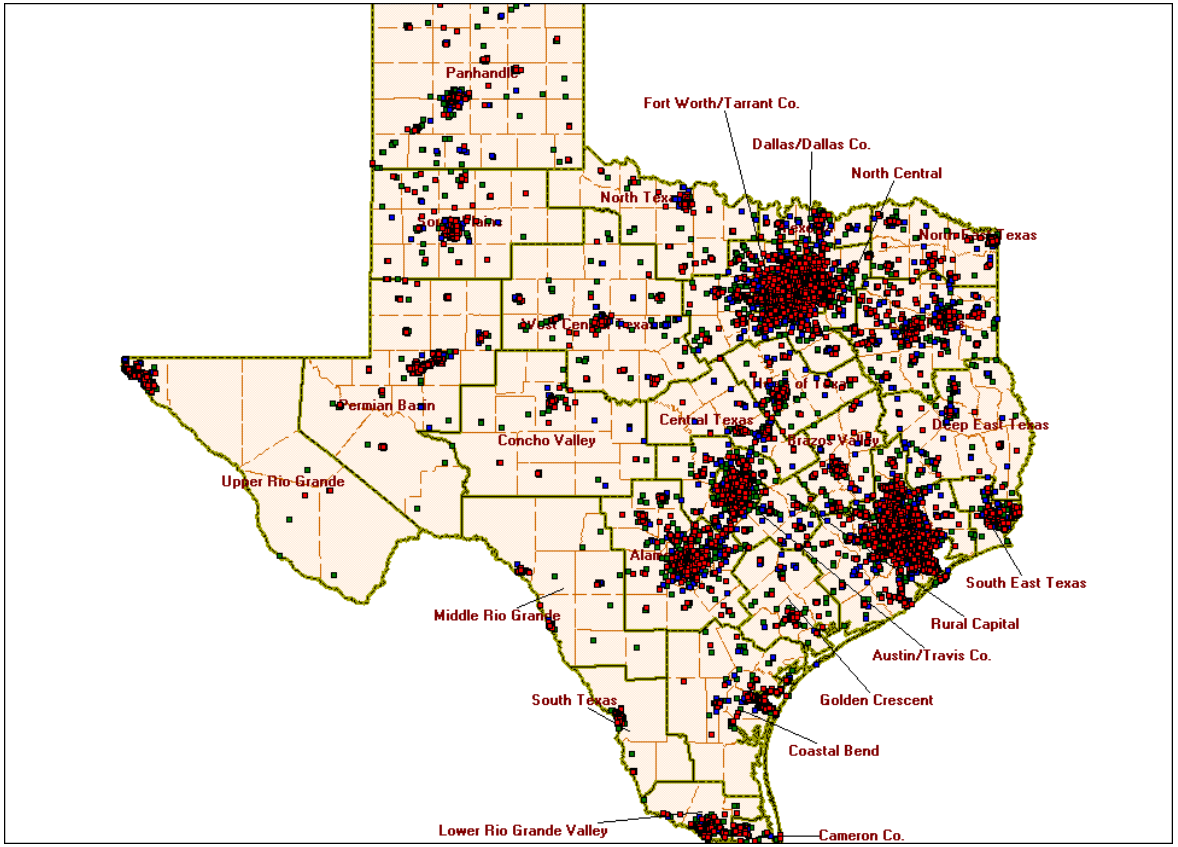
Texas IS A Whole Other Country of Opportunity



Leveraging and responding to the needs of 4600 utilities & 5000+ corporate plants, campuses, facilities requiring water for production and manufacturing

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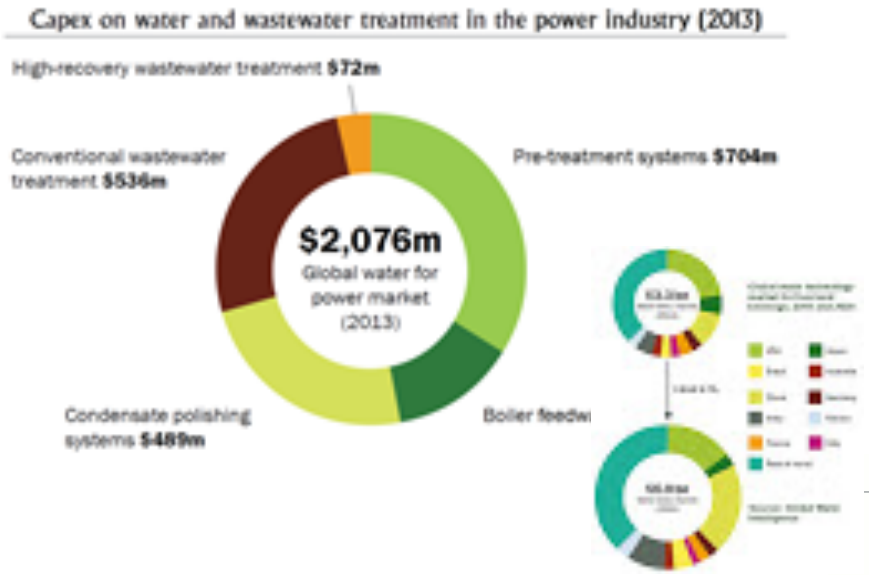
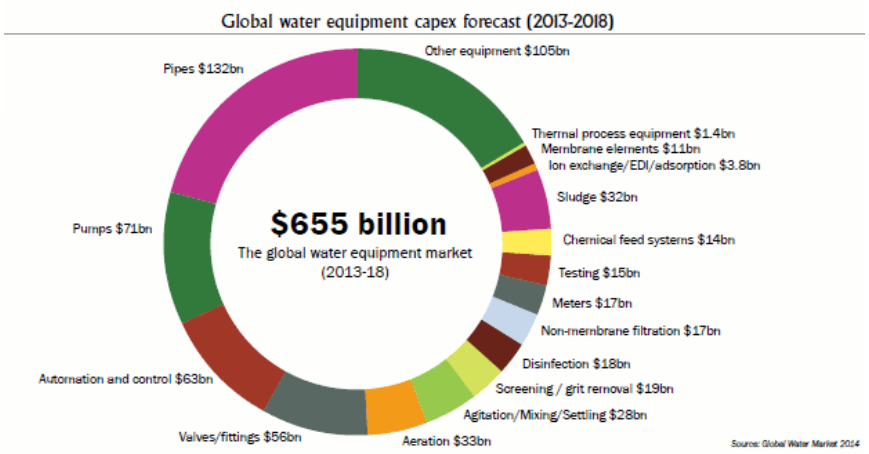
Understanding the Cost of Water and Role of Technology: Can we generate "new" water?





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The Reality of Water Economics:
Water has not, never has been and will not be free

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Our Mission Statement:

"…AccelerateH2O is a driver of Texas' $9 billion water technology market by organizing assets, expertise, knowledge, and resources to more efficiently and effectively respond to our current crisis and position us as the leading Global Water Technology Hub…"

The Texas Water Technology Landscape

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Our Role: connection point to strengthen, enhance, support, and partner multiple sources of innovation, technology, and practical solutions for Texas' greatest challenges and unique opportunities

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Our Focus: Technologies and Barriers

- Technical and Technology Focus:
  Desalination, Conservation, Reuse, Smart Water
- Tackle Barriers, Rules, Perceptions Limiting Technology Deployment
- Forums on Technology Adoption, Investment, Procurement
- Demonstration Projects for Knowledge-Sharing, Planning
- Early and Growth Stage Commercialization and Investment
- Alignment of Workforce, Skills and Training of Next Generation Water Tech
- Clearinghouse of Vetted, Proven and Cost Effective Technologies

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Proposed Grand Challenge Topics: WaterQuest Competitions

- Brine, Concentrate Management from Desalination
- Produced Water & Waste from Energy Processes
- Arsenic and Radon in Small Water Systems
- Reduction of Energy Demand in Desalination
- Storm-Water, Run-Off Impact Reductions
- Leak Detection and Advanced Sensors, Monitoring
- Integrated Data, Modeling, Instrumentation
- Location, Mapping Desal of Brackish Waters & Aquifer Recharge
- Advanced “Smart” Irrigation Systems

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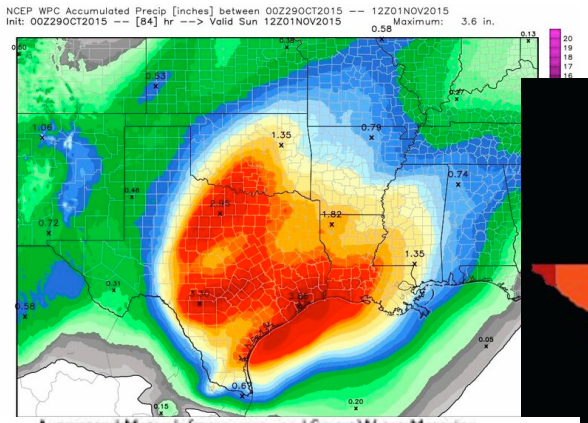
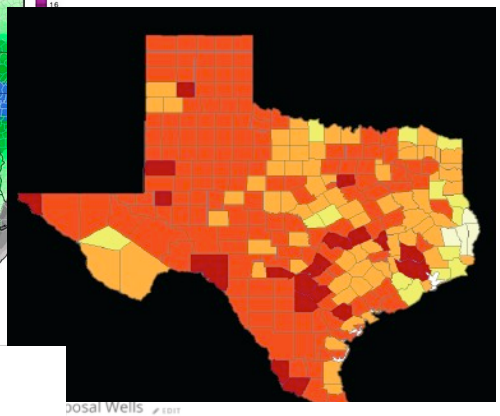
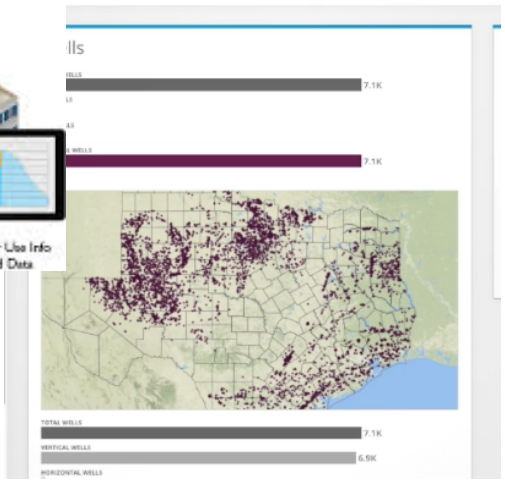
Texas Open Water Data Initiative and Consortia:

Connecting Instruments to Data Analytics, Real-Time Forecasting







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Strategic High Impact Projects:
Innovative Water Demonstration Hubs and Pilot Initiatives

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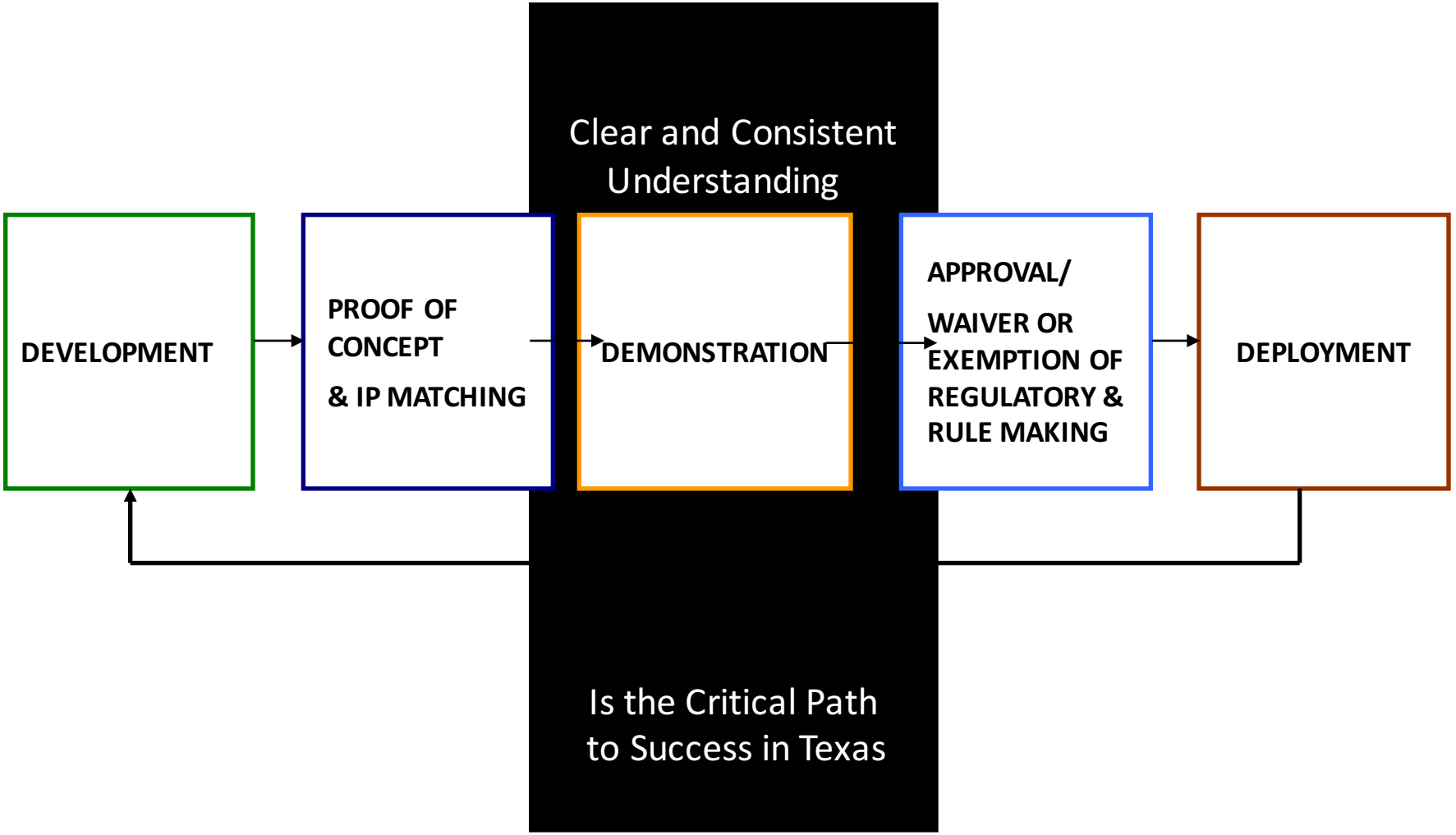
Our Scope of Work: Streamlining a More Efficient and Effective Water Technology Value Chain



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Objectives of Innovative Demonstration Hubs

- Professionally organized, managed, delivered testing, evaluation, demonstration of existing and emerging technologies to solve specific use-cases and demands
- Establish baselines for scientific, engineered, and technical determinations, approvals, efficacy
- Integrate solutions with current operations, future expectations
- Economically prove and deploy solutions, practices, and technologies that position Texas as a global source of innovation

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Innovative Water Demonstration Hubs

Proposed Hubs:
Greater Galveston
Lower Gulf Coast
Rio Grande Valley Irrigation District
Eagle Ford Produced Water
Permian Basin-West Texas
Produced & Brackish Water
El Paso Brackish Water

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Innovative Water Demonstration Hub Framework

- Responding to Growth and Mature Stage Technologies Required Field-Test and Evaluation for Permitting, Investing, Procuring Decision-Makers
- "Conceirge" Type of Service Model to Identify, Secure, Organize, and Deliver Professional Demonstrations On or Adjacent to Specific Water Quality, Geology, Industry, End-User Base
- Streamline the Process for Scientific, Engineered Evaluation and Approval
- Connect Real-Time Knowledge Sharing, Learning, Application of Results and Findings

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Example: Produced Water from Conventional and Unconventional Energy Activities

Partnership with Leading SWD and Energy-Water Nexus Management Consulting Team

- 150'x150' site pad with access to truck, tank, and discharge well waters, related facilities and testing equipment;
- Site licensed, existing and required permits for handling water and waste;
- Safety and health program, site operations, and workforce/visitor agreements
- Source water baseline, discharge of waste and/or off-site discharge partnership with river authority, municipality

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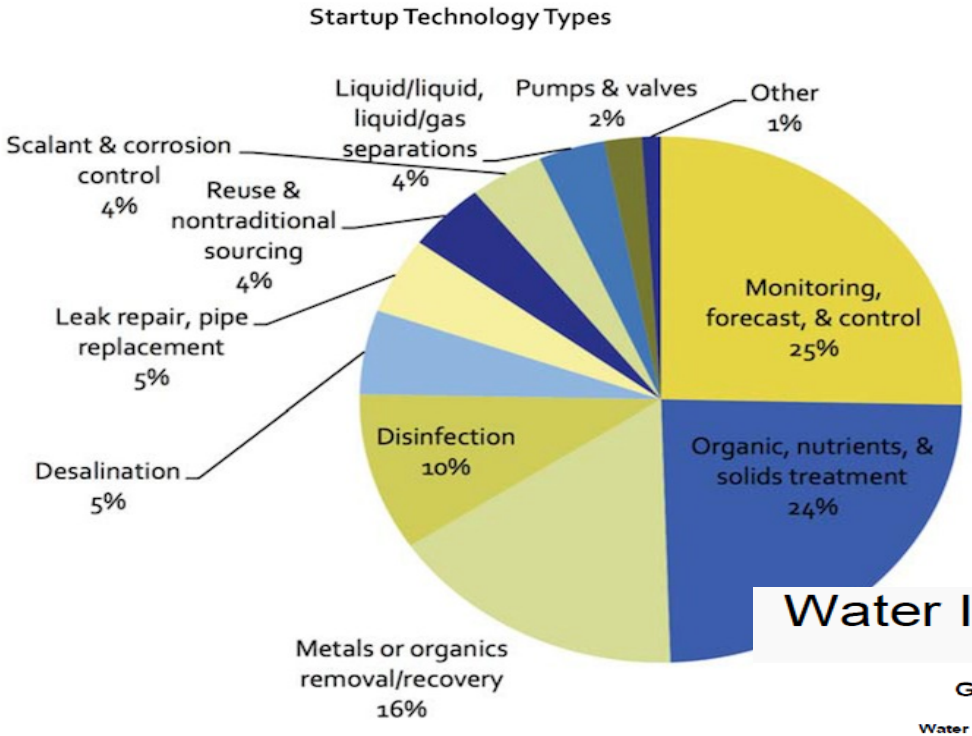
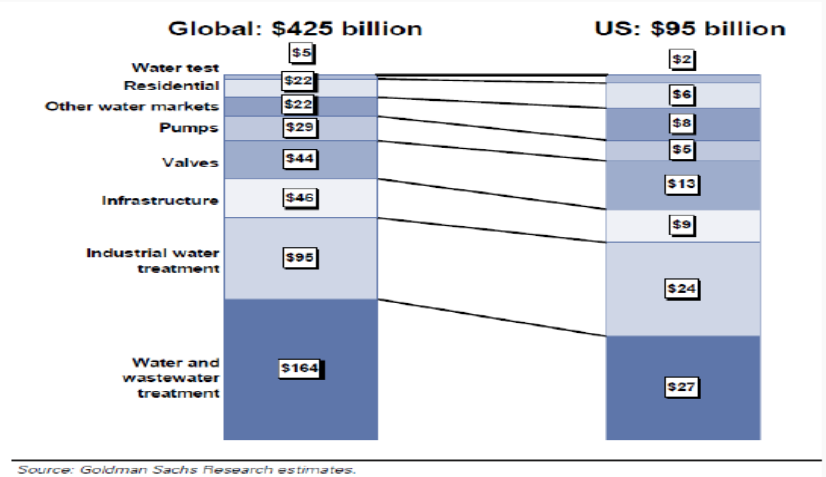
Texas Water Technology Investor Forums



Water Innovation Market Opportunity



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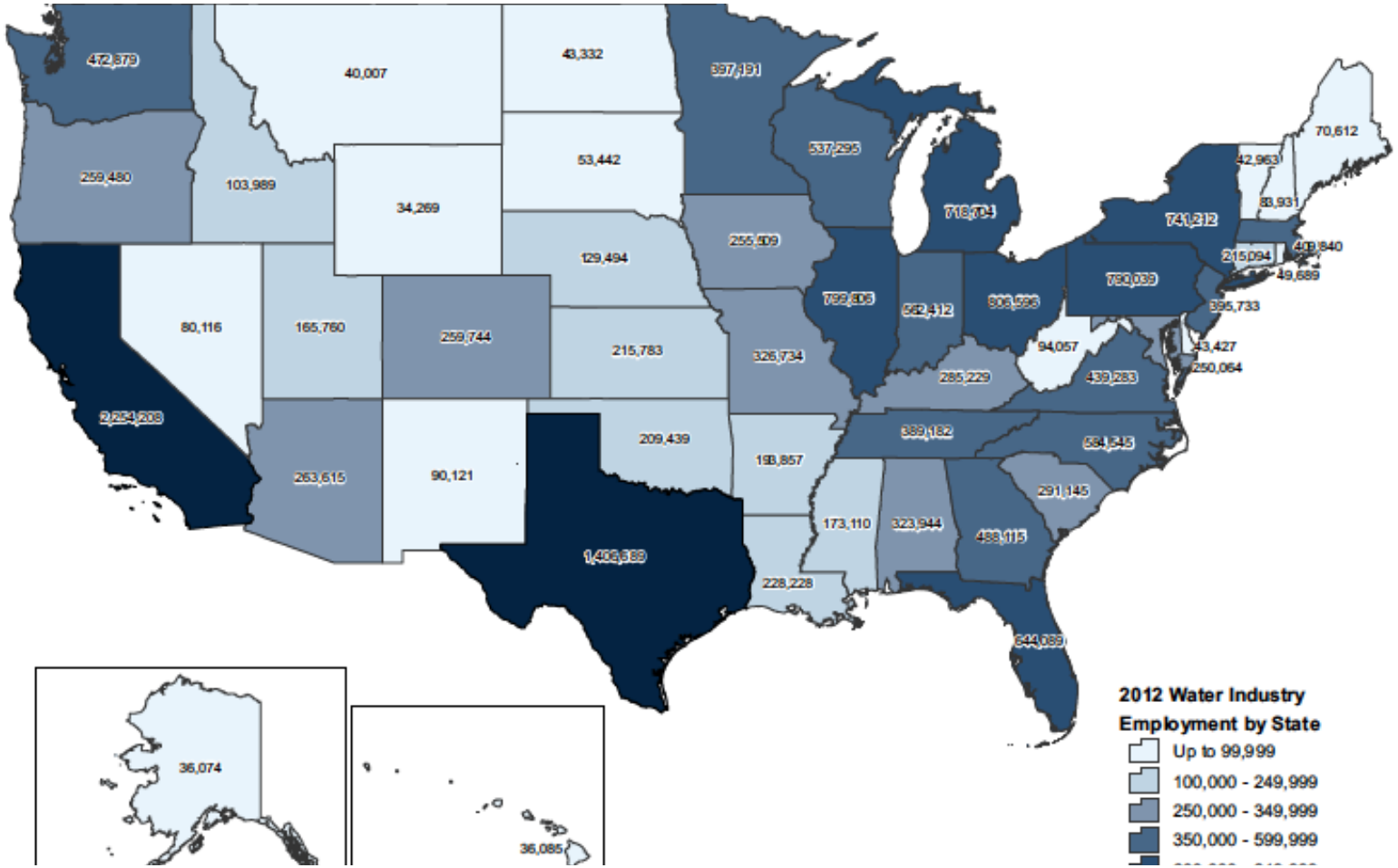
National Employment – Water-related industries



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Top 10 States: Direct and Indirect Employment

	Employed				% of Total Employed			Ranking of State		
State	Core Water Products and Services	Water Enabled Industries	Total Water Related Industries	Total Employed	Core Water Products and Services	Water Enabled Industries	Total Water Related Industries	Core Water Products and Services	Water Enabled Industries	Total Water related
CA	571,542	1,685,345	2,254,208	12,684,429	4.5	13.3	17.8	7	24	16
TX	*340,438*	*1,070.597*	*1,406,689*	*8,964,789*	*3.8*	*11.9*	*15.7*	*13*	*32*	*29*
OH	117,798	683,528	806,596	4,337,301	2.7	16.0	18.6	32	13	14
IL	173,711	627,182	799,806	4,843,785	3.6	12.9	16.5	15	26	23
PA	167,199	625,434	790,039	4,887,296	3.4	12.8	16.2	16	28	26
NY	229,917	514,542	741,212	7,190,226	3.2	7.2	10.3	21	46	47
FL	211,617	432,910	644,089	6,312,193	3.4	6.9	10.2	19	47	48
NC	106,933	479,442	584,545	3,226,792	3.3	14.9	18.1	20	16	15
WI	49,621	487,828	537,295	2,315,717	2.1	21.2	23.3	46	1	1
GA	93,683	396,240	488,115	3,190,572	2.9	12.4	15.3	26	31	31

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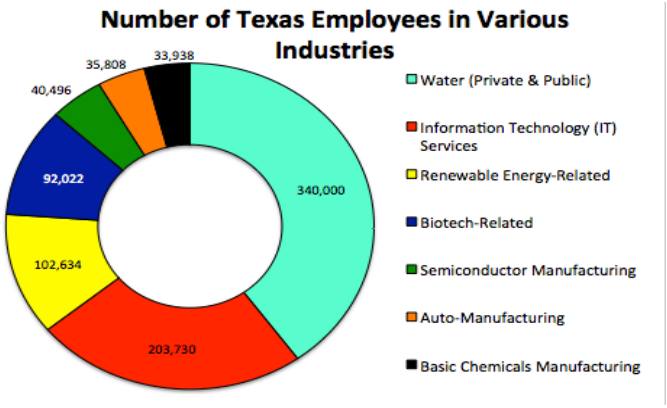
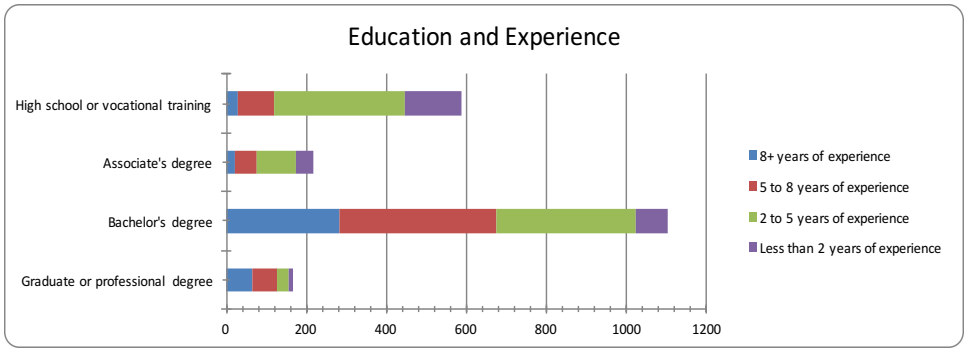
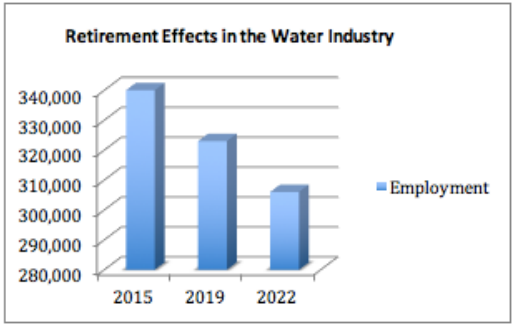
Texas Water & Water Tech Employment Cluster







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Economic & Workforce Partnership:
21st Century Water Technologist Initiative

- Identify and assess current and future job demands for water and water technology
- Identify which technologies will cause new skills, talents, capabilities
- Determine how water technology jobs are 'trained, skilled, demonstrated, certified'
- Connect Workforce Investment Boards, High Schools, Community Colleges, Four-Year Institutions, Adult Continuing Education, Veterans Programs AND Economic Development Organizations, Chambers, End-User Communities
- Promote water technology employment opportunities as an economic engine for Texas

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Innovating Water through Sustainability

Corporate Objectives for Bottomline Impact from Water Recovery, Reuse, Reclamation and Zero-Discharge:

Proposed Texas Partnership for Statewide Collaboration & Implementation

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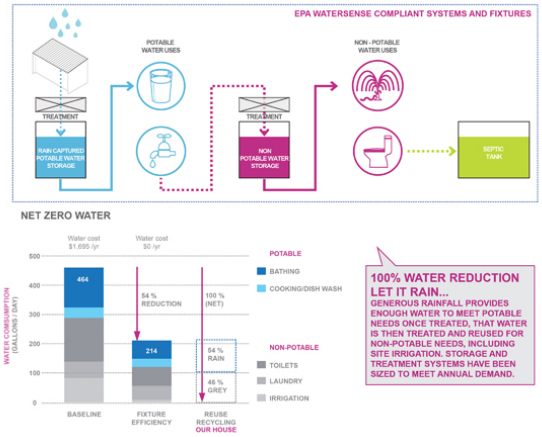
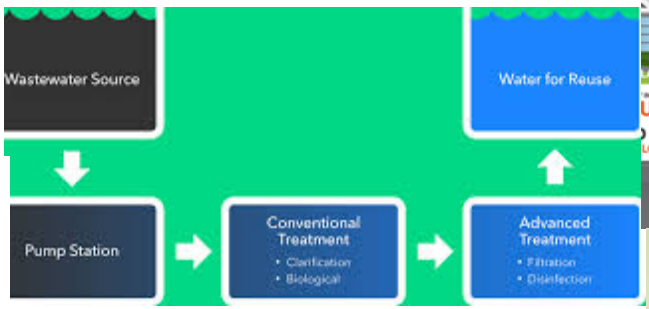
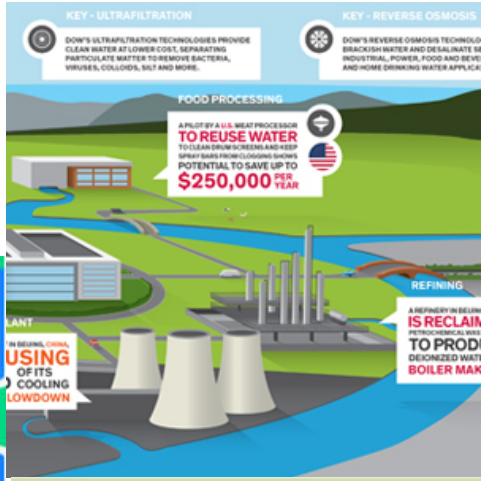
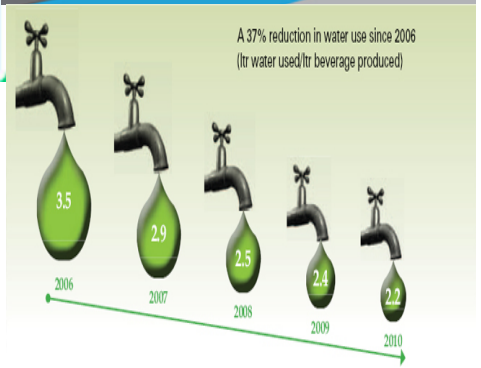
Perspective: Sustainability = CFO, COO, CTO & CSR









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Global Brands for Sustainability of Water & Innovation

Medtronic

PEPSICO

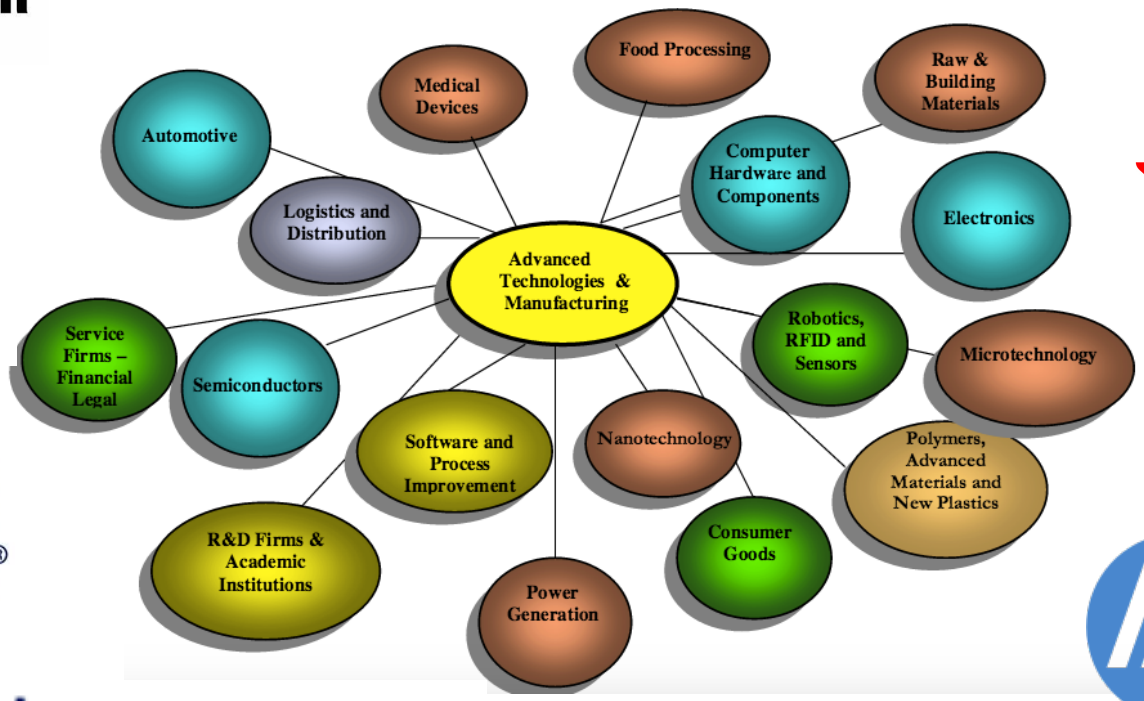
Campbell's

CATERPILLAR®

Coca-Cola

TOYOTA

TEXAS INSTRUMENTS



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Suggested Approach to a Texas Water Sustainability Initiative and Consortium

- Identification of specific water reuse, conservation 'grand-challenges' that are common across several industries and sectors – defining sustainability within these industries and sectors by outcome, impacts, and performance metrics
- Identification of technical, engineered gaps for resolving the operational, in-field, and practical level of demonstrating efficiency, effectiveness AND the economics of innovative solutions
- Identification of a regional approach – integrating public and private sector water suppliers, vendors, end-users, and the larger communities of interest (academic research institutions, business and civic organizations, economic and workforce development) to promote an integrated model for water sustainability
- Implementation of a six-, twelve- and eighteen-month scope of work, deliverables, reporting and "branding" initiative that results in transformational use of water and new innovative practices
- Leverage the Texas Water Innovation Clearinghouse and Collaboratory for project management, engagement, and conduct of Grand-Challenge competitions and program implementation

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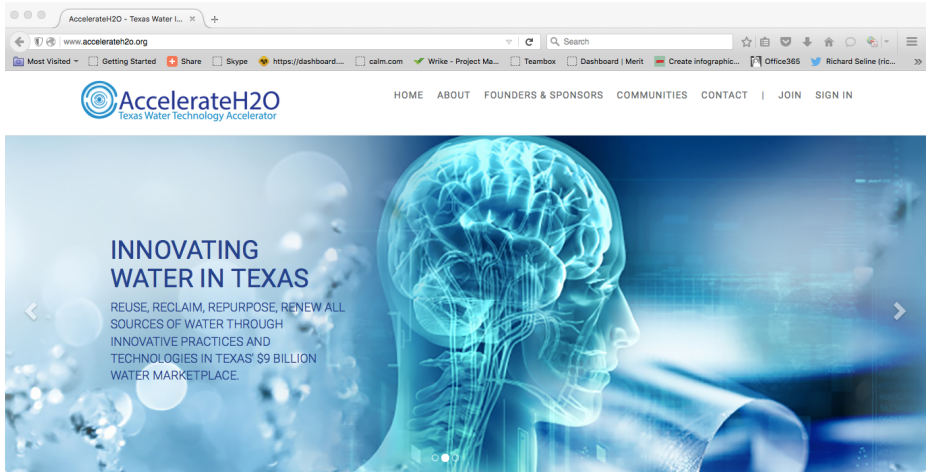
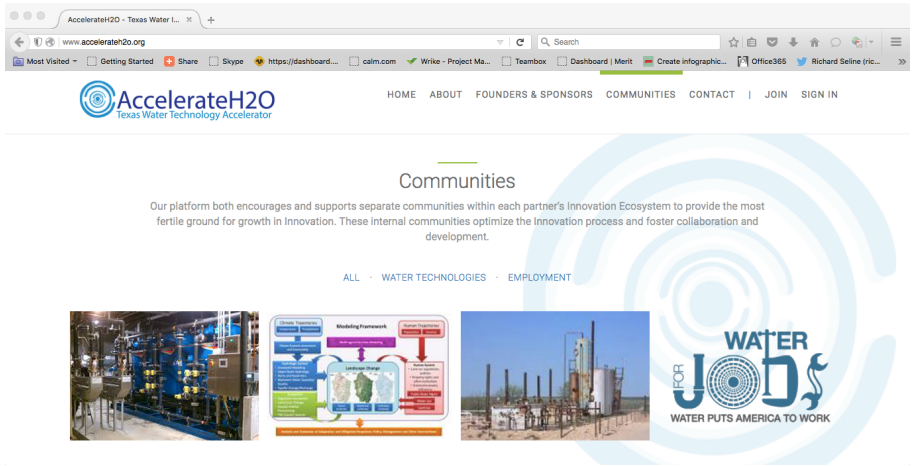
Texas Water Innovation Clearinghouse & Collaboratory





To enable an open trusted collaborative Water Ecosystem where participants **Learn**, **Share**, and **Connect** to dramatically increase and improve public-private sector water-related research commercialization, problem solving and business development.

Our Partners for Implementing Goals

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Texas Water Innovation Clearinghouse and Collaboratory

www.AccelerateH2O.org