USDN Urban Water Learning Project Emerging Utility Performance Standards *Draft 1*

January 16, 2014

Utility Performance Standards Process and Progress to Date

- *Identify topic and sub-questions (Done)*
- *Conduct initial research (Done)*
- *Produce first draft of findings (Done)*
- **Review findings with advisors - identify additional questions & resources (We Are Here)**
- Revise report & review with advisors
- Complete report for dissemination to advisors & others

NOTE TO ADVISORY BOARD:

- **As you review the information:**
  - What's new and interesting?
  - What further questions does it raise?
  - **Is this information you want to share with your city's water people?**

Questions We Started With

1. What are the leading ideas/initiatives around setting utility performance standards?
2. Who's actually doing this right now?
3. Where are the organizations with progressive performance measures in place?
4. How far has standard development proceeded?

Summary of Initial Findings

- **Strong utility input & interest in standard setting**
  - Some project members participating in design & piloting
    - Cincinnati, Denver, Milwaukee, Washington, D.C.
    - Other utilities: East Bay Municipal Utility District, Metropolitan Water District of Southern California, San Francisco Public Utility Commission, Seattle Public Utilities
- **Although non-regulatory, multiple reasons utilities may care about emerging standards that could affect:**
  - Access to capital (debt & equity)
  - Reputation/brand
  - Improved water management outcomes
- **Multiple standards suggest a "leading edge" for sustainable water management best practices**
  - Goal setting
  - Practices
  - Indicators & metrics

Framework for Utility Standards
section by section

Section 1 **Utility Standards Defined**	• **Slides 6 - 10**
Section 2 **Utility Standards Inventory**	• **Slides 11 - 21**
Section 3 **Convergence on Practices**	• **Slides 22-27**
Appendix	• **Slides 28 - 33**

Utility Standards Defined

Definition of Utility Standard

Definition of Standard

For the purpose of this study, Utility Standards:

- Set an acceptable or desirable level of **quality/achievement in the consumption and treatment** of water resources
- Define goals for a utility by broadly **designating operations criteria** to establish provisions (such as anti-degradation policies to protect water bodies from pollutants)
- Can apply to public/private utilities, or be adopted by private entities
- Can be global, national, regional, or local
- Are **voluntarily adopted** but could become part of government requirements

Standard Type

For the Purpose of this inventory, standards are classified by what goal aspect they focus on:

- Ecological Impacts
- Efficiency
- Investor Security
- Overall Sustainability

Standard Development Process

Development Drivers

Standards development is driven by:

- **Vision of Sustainability**
- **Risk**
  - Climate Change
  - Supply/Demand Imbalance
- **Investor appeal**
  - Customer Sovereignty
- **Regulations**
  - Consent Decrees
  - Unfunded Mandates

Management Practices

Standards development shows:

- Varieties of performance levels
- Varieties of metrics
- No radical divergence between standards
- A picture of emerging industry goals

Major Initiatives or Standards Players Examined

Standard Category	Responsible Organization	Standard Name
Financial disclosure	Ceres	Aqua Gauge
Water conservation	American Water Works Association (AWWA)	G480-13 Water Conservation Program Operation and Management Standard
Regional Initiatives	• California Water Foundation (CWF) • Great Lakes & St Lawrence Initiative (GLI)	Sustainable Water Management Profile (CA) Sustainable Municipal Water Management Framework & Scorecard (Great Lakes)
Stewardship	Alliance for Water Stewardship (AWS)	The Standard
Infrastructure	Institute for Sustainable Infrastructure	Envision
Community Benefits	Green For All	Green Infrastructure

Overview of the Playing Field

- The standards apply to **different scales and vary substantially** by:
  - Type of standard
    - Principles
    - Guidelines
    - General best practice
    - Management system
    - Specific best practice
    - Outcomes
  - The tools that are being built:
    - Investment assessment
    - Disclosure requirements/reporting data
    - Assessment/rating
    - Self-assessment/third party

- The standards target **different specific processes/assets** of a water utility:
  - Infrastructure/green infrastructure performance
  - Demand management
  - Financial risk
  - Planning processes

- Note that some standards are already in place:
  - EPA has pollution control standards
  - Bond investors have historical rationale for utilities' projected revenues & debt service coverage

Utility Standards Inventory

Standards Inventory: Top 16

Organization	Standard Name	Standard Type	Release	Market	Assessment Method	Market Leverage
American Water Works Association (AWWA)	G480-13 Water Conservation Program	Utility Management	07/2013	American Utilities	Self Assessment	Customer Relations
Alliance for Water Stewardship (AWS)	The Standard	Water Stewardship - investors	03/2013	International, all sectors	Self Assessment	Investor Relations
California Water Foundation	Standards Initiative	Water Stewardship - investors	2014	State of California	Self Assessment	Capital Procurement
Ceres	Aqua Gauge	Water Stewardship - investors	04/2013	North America	Incorporated into the bond process	Capital Procurement
Ceres	Financial Disclosure	Resource Stewardship - investors	2013	International, private sector	Self Assessment	Investor Relations
Great Lakes	Standards Initiative	Water Stewardship - stakeholders	June 2012	Great Lakes Region	Self Assessment	Customer Relations

Standards Inventory: Top 16

Organization	Standard Name	Standard Type	Release	Market	Assessment Method	Market Leverage
Institute for Sustainable Infrastructure	Envision	Infrastructure Management	2012	North America	Self Assessment	8 major engineering firms, 1,000 certified to rank
International Organization for Standardization	ISO 9000, 14001, 50001, 24510	Infrastructure Management	2011	International	Third Party Verification	Established in 1946, name carries weight
The Climate Registry	The Climate Registry General Reporting Protocol V2	Operational Efficiency	2009	North America, all sectors	Voluntary and Mandatory Programs	Customer Relations
The Yale Center for Environmental Law & Policy (YCELP)	Environmental Performance Index (EPI)	Country Rankings	2012	International	3rd party prepped based on available data	Funding (national aid) capture
US Environmental Protection Agency	Environmental Management System (EMS)	Utility Management	2003	American Utilities	3rd party prepped based on available data	Federal Recognition

Profile: Aqua Gauge

General Description

- A standardized tool to help companies manage water risk. It provides a qualitative assessment of water management, allowing benchmarking against leading best practices
- Developed through collaboration between Ceres, the World Business Council for Sustainable Development, Irbaris, and IRRC Institute.
- Reflects input / feedback from over 50 financial institutions, companies and NGOs, and is supported by investors managing over $2 trillion in assets.

Highlighted Measures

- Deals strictly with corporate-level views on water risk management, divided into four key areas:
- 1) Measurement / Data Gathering
  - regulatory compliance
  - water use and discharge
  - environmental and social impacts on water
  - External factors affecting direct water sources
- 2) Management
  - Effectiveness of suppliers' water management practices
  - Risk Assessment for direct operations & supply chain
- 3) Stakeholder Engagement
  - Stakeholder perceptions and concerns related to water issues
- 4) Disclosure
  - Data and analysis related to water in financial filings/reports
  - Audited/assured water-related data

Profile: AWS Standard

General Description

- Designed to be an international, standard that defines a set of water stewardship principles, criteria, and indicators for how water should be stewarded at a site and watershed level in a way that is environmentally, socially, and economically beneficial.
- Blends enterprise and site- or catchment-level.
- Because AWS believes few entities can solve their water problems by themselves, it sees much of the implementation occurring at the watershed or river basin scale.

Highlighted Measures

- Commit—ensure sufficient leadership and commitments to legal/regulatory compliance and rights-related issues.
- Gather & Process—gather data to understand water risks, impacts, and opportunities.
- Plan—a plan for improving performance, based on information in previous step.
- Implement—ensure the site is executing the plan, mitigating risks and driving performance improvements.
- Evaluate—review performance, learn from outcomes and inform next iteration of stewardship plan.
- Communicate & Disclose—encourage transparency and accountability through public presentation of performance.

Profile: AWWA G480-13

General Description

- This is a voluntary standard (not specification) that describes minimum requirements and doesn't contain the information / administration details that a specification would.
- It can be voluntarily adopted by water providers who want to demonstrate organizational commitment to management best practices.
- This new utility management standard describes the critical elements of establishing, implementing, and evaluating an effective water conservation program.
- It encompasses utility activities to improve water use on the supply side through distribution system management and on the demand side through customer billing and education practices. A conservation program using this standard has the potential to impact all water users.

Highlighted Measures

- Regulatory requirements
- Top Level Organizational Functions (dedicated staff, water conservation planning, water conservation in integrated resource planning, public information and education program, water waste ordinance)
- Internal Utility Actions and Requirements:
  - Metering practices:
    - Universal metering
    - Source metering
    - Rate structures
    - Billing practices
    - Billing frequency
    - Reporting consumption
    - Landscape efficiency program
      - Design, installation, and maintenance practices
      - Irrigation scheduling
      - Landscape water budgets
  - Distribution system and pressure management
    - Utility water audit
    - Water loss control program
- External Policy Requirements:
  - Water efficiency in building codes and standards
  - Promote water-efficient products and services
- Wholesale Agency Requirements

Profile: Envision

General Description

- A framework for evaluating and rating the community, environmental, and economic benefits of infrastructure projects
- Addresses owner sustainability based needs and challenges in a number of ways, many of which are unique to the practice of infrastructure design and to sustainability rating systems
- Envision appears to the ranking system that has the most traction to date in the industry

Highlighted Measures

- Enhance Public Health and Safety
- Establish a Sustainability Management System
- Provide for Stakeholder Involvement
- Improve Infrastructure Integration
- Plan Long-Term Maintenance and Monitoring
- Address Conflicting Regulations and Policies
- Extend Useful Life
- Manage Stormwater
- Prevent Surface and Groundwater Contamination
- Maintain Wetland and Surface Water Functions
- Assess Climate Threat /Prepare For Long-Term Adaptability
- Prepare for Short-Term Hazards
- Protect Fresh Water Availability
- Reduce Potable Water Consumption
- Monitor Water Systems
- Preserve Wetlands and Surface Water
- Preserve Floodplain Functions
- Avoid Unsuitable Development on Steep Slopes

Profile: Great Lakes Region

General Description

- Adopted June 2012 by mayors of the Cities Initiative
- To protect shared water resources
- Consists of:
  - A framework for SMWW
  - Description of milestones to work toward
  - Indicators to measure progress toward milestones
  - Best practices to illustrate how cities have put SMWW into practice
  - A guide to preparing a public evaluation report
- Voluntary standard for municipally controlled water, wastewater, and stormwater utilities.
- Not meant to compare one municipality's performance against another but rather to chart the progress within each
- Shift in focus: from operational to a sustainable water management
- Framework organized around 6 principles, each with milestones
  - Water Conservation and Efficiency
  - Shared Water
  - Shorelines and Waterways Restoration
  - Water Pollution Prevention
  - Water Protection Planning
  - Water Preparedness for Climate Change

Highlighted Measures

- Examples of measurable targets:
  - 33 cities report annually on water conservation progress toward reducing use by 15% over 15 years.
  - Quebec government requires that municipalities reduce water production by 20% by 2017 and water losses to less than 20% of water produced.
- Section on how to prepare an evaluative scorecard for the public, based on the milestones and indicators.
- Standards come with disclosure/transparency policies and, in some cases, with public engagement policies/practices. There don't seem to be any standards for public engagement.
- Standards can measure against any or all:
  - Absolute performance
  - Comparative performance
  - Historical performance
  - Many innovative practices water utilities adopt are also opportunities to increase community awareness and engagement with water issues

Profile: CA Water Foundation

General Description

- Decided to develop a tool to assess sustainable water management and motivate improvement at a regional scale.
- Concluded that existing sustainability assessment tools focus on generic indicators instead of region- and California-specific information and conditions, and they don't take into account steps agencies are taking to address their water challenges.
- No tool currently exists that distills complicated water information into an easy-to-understand, yet comprehensive, assessment of the condition and stewardship of California's water management systems at a regional scale.
- Tool would focus on sustainable water supply management, accessible and scalable to different audiences, applicable throughout California; and adaptable to unique attributes of a region.
- Use would be voluntary. *Note: There's a concurrent effort in state government to embed sustainability indicators into the California Water Plan, which is updated every few years.*

Highlighted Measures

- Water Balance: Assesses water supply and demand and other factors(climate change) that impact water supplies
- Water Supply could include seven indicators, each with metrics:
  - Groundwater Index
  - Surface Water Index
  - Contracted Water and Water Rights Index
  - Water Quality Index
  - Reliability Index
  - Reuse Index
  - Portfolio Diversity
- Climate Change could include these metrics:
  - Portion of supply from snowpack
  - Portion of supply affected by sea level rise
  - Precipitation decreases and/or changes in timing
  - Evapotranspiration increases
  - Delta imports
  - Energy
- Environment: Assesses the environmental and land use factors that influence water quality and quantity
- Financial Health: Assesses financial conditions that impact the ability to manage water resources
- Collaboration and Integration: Assesses stakeholder outreach, pursuit of multi-objective projects, and partnering between water agencies and other entities (e.g., integrated planning)

Profile: Financial Disclosure

- **Supply Security (analyzing reliability):**
  - Scenario analysis informing supply management
  - Assessment of climate change effects
  - Standing of water rights relative to other users
  - Volumetric conditions of water resources (surface and groundwater)
  - Condition assessment of the watershed feeding supply
  - Historic and planned investment into watershed protection
- **Demand Management (conservation and efficiency)**
  - Assumptions underlying demand projections
  - Sensitivity of demand projections to price
  - Percent of supply from conservation/efficiency and progress against demand management goals
- **Asset Management (characteristics of facilities):**
  - Water loss rates
  - Asset condition assessment and replacement
  - Valuation and budgeting for natural infrastructure management (forested lands, wetlands, constructed green spaces)
- **Water Quality**
  - Steps being taken to comply to anticipated regulation
- **Energy Use / Generation (may present operating cost constraints or benefits):**
  - Energy intensity for water treatment and delivery
  - Energy generation
- **Rates (rising supplies and treatment is leading systems to redesign rates to create pricing incentives for demand reduction)**
  - Drinking water rate structure for all customer sectors.
  - Structure of stormwater and wastewater rates

A Note on Green Infrastructure

- Green Infrastructure performance depends heavily on context of soil and moisture, which is highly variable by place as well as season/event.
- Government is mandating certain levels of runoff capture and then practitioners have to demonstrate they've done it.
- Green for All, which convened a leading-edge utilities meeting, is working on framing green infrastructure investment as a community benefit that has a triple bottom line.
  - Economic benefits: consent decree targets, less costly than gray infrastructure
  - Environmental benefits: filtered runoff
  - Equity measures: more green space for all

- This is an early-stage practice, not well-defined or with standard metrics, but that could become a standard eventually

Convergence on Practices

Top Themes Across Standards

No Borders

- **Examples of Reoccurring Themes:**
  - Leadership Commitment & Policies
  - Integrated Planning
  - Measurement/Data Gathering/Metrics
  - Performance Evaluation
  - Engage Stakeholders
  - Disclosure

Regions

- **Examples of Regional Items:**
  - Climate Change Issues
  - Water Supply Sensitivities
  - Watershed Planning
  - Integrated Systems Planning
  - State Support/Programs
  - State/Regional Regulations
  - Comparison Sensitivities

Converging on Goals, Practices & Metrics

Measures Immediately Evident	Aqua Gauge	AWS	California	Ceres Financial	Envision	Great Lakes
Conservation & Efficiency			X	X	X	X
Shared Water Stewardship, Collaboration	X		X	X		X
Ecosystem Restoration & Protection			X	X	X	X
Pollution Prevention	X	X	X	X	X	X
Climate Preparedness			X	X	X	X
Energy Use & Generation	X	X		X	X	X
Pricing			X	X		
Asset Management	X	X	X	X	X	X
Others	X	X	X		X	X

What to Expect Ahead

- Watershed/Basin-level planning
- Standards based on
  - Operational best practice for efficiency & demand reduction
  - Climate readiness
  - Community benefits
  - Standardized indicators & Metrics
- Brand-building opportunities

How You Can Help

We want to understand how the profiled standards might affect utilities' behaviors

- We **need to talk with several green infrastructure experts** in water utilities who can explain how they calculate the potential performance of green infrastructure and what the basis of those calculations is
- We need to **better understand the various models for rate setting** that utilities have to deal with.
- We need to **better understand the various sources of capital** for utilities — bond market, state RLFs, others — and how utilities access them.
- If you have **connections to relevant expertise**, please let us know.

Sources for Profiled Standards

Aqua Gauge (Ceres)

http://www.ceres.org/issues/water/aqua-gauge

The AWS International Water Stewardship Standard

http://www.allianceforwaterstewardship.org/Beta%20AWS%20Standard%2004_03_2013.pdf

American Water Works Association ANSI / AWWA Standard G480-13 Water Conservation Program Operation and Management

http://www.awwa.org/publications/standards.aspx

Envision (Institute for Sustainable Infrastructure)

http://www.sustainableinfrastructure.org/rating/index.cfm?utm_source=NHC+Master+List&utm_campaign=e85c0b18fc-DR_589&utm_medium=email

Great Lakes/St Lawrence Initiativehttp://coe2013.org/wp-content/uploads/2013/10/COE-General-Session-Sustainable-Municipal-Water-Management.pdf

California Water Foundation. "Project Profile: Sustainable Water Management". 2013.

http://californiawaterfoundation.org/page.php?id=71&menuid=77&ajax=100

Financial Disclosure (Ceres)

https://www.ceres.org/resources/reports/disclosure-framework-for-water-sewer-enterprises

Appendix 1: Water System Goals

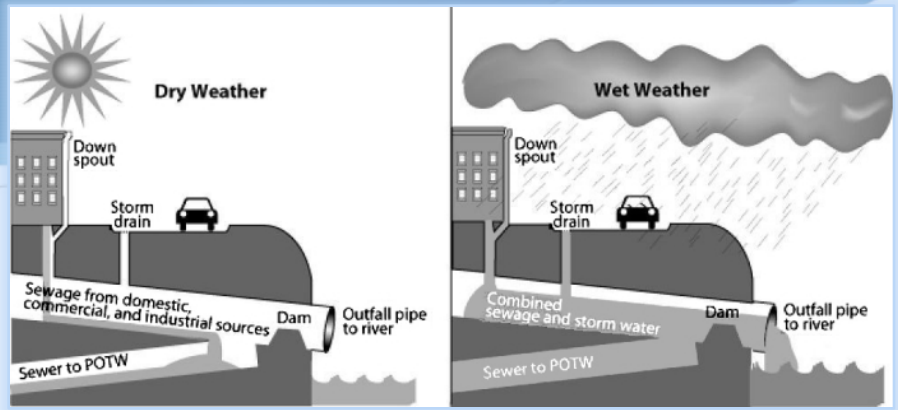
Traditional Water System Goals

Goal	Metrics
Consistent Service / Sufficient Quantity	• Pure drinking water (at the tap) • Managed stormwater (straightest path to the river) • Treated effluent (systematic, to standard management) • Infrastructure management / maintenance
Regulatory Compliance	• None or reduced citations / violations on water quality and overflows • Separate storm and waste water systems
Service Delivery	• Cutting waste from the system
Customer Satisfaction	• Satisfaction ratings
Safety: Flood Prevention & Property Protection	• Facilities in good state of repair • Water main breakage attended to quickly • Eliminate operations / maintenance related fatalities • Manage stormwater to reduce property / life risks
Waste Reduction	• Reduce system leakage of treated water
Resource Utilization	• Adopt energy efficiency retrofits, renewable energy, methane capture, waste to energy if possible
Financial Viability	• Operating revenues and capital debt management

[21] U.S. EPA "Water Sector Collaboration on Effective Utility Management" Fact Sheet, May 2007
http://water.epa.gov/scitech/wastetech/upload/fs_si_waterutility_collaborationeffectivemanagement.pdf

Traditional System Goals: Fit for Use & Consent Decrees

- Drinking water standards drive consent decrees
- National Primary Drinking Water Regulations (NPDWRs / primary standards) are legally enforceable (EPA) and apply to public water systems. Primary standards protect public health by limiting the levels of contaminants in drinking water.
- List of EPA Contaminants by category
- http://water.epa.gov/drink/contaminants/index.cfm#List
  - *Micro organisms*
  - *Disinfectants*
  - *Disinfection Byproducts*
  - *Inorganic Chemicals*
  - *Organic Chemicals*
  - *Radionuclides*



The EPA has acknowledged the financial challenges the orders cause localities, writing in a recent notice in the federal register that state and local governments' "ability to finance improvements by raising revenues or issuing bonds has been significantly impacted during the ongoing economic recovery."

-"Mayors Question EPA Consent Decrees", Governing Magazine, June 2012
http://www.governing.com/blogs/fedwatch/mayors-question-epa-consent-decreees.html

Sustainable Water System Goals

Efficient	Water supply values conservation and using the least amount of water possible for the desired use; Wastewater system minimizes leakage and energy use; Stormwater system filters first flush and removes excess water.
Resilient	All water systems can withstand variations in water availability and quality caused by aging of infrastructure, population growth, climate change, and other factors.
Regenerative	All water systems manage water use to maintain the natural system's "water budget" as its regenerative capacity – clean (quality) and safe (supply).
Clean and Safe	Water supply system delivers water that is safe for its intended use and meets government/scientific standards from wastewater treatment standards; stormwater does not encroach on life and property.
Equitable	All water systems provide all segments of population with fair and fair and adequate access to water supply and services needed for health and life, while offering non-discriminatory opportunities to use water for economic gain or threatening life and property.

[5] The Innovation Network for Communities, "Accelerating the Development of Sustainable Urban Water Markets in the U.S." January, 2013.

Barriers to Sustainable Water System Goals

Efficient	Aging infrastructure loses water, profit is structured to coincide with consumption, so there's little incentive to conserve.
Resilient	There is a lack of recognized mechanisms for making linkages between drinking water supply, stream water quality issues, and stormwater quality/quantity. Aging of infrastructure, population growth, and climate change remain unaddressed in most systems, meaning they are not elastic. Lack of funds and political will stand in the way of this.
Regenerative	Gray infrastructure remains the primary stormwater management tool, so the system is hindered in its water recycling. Pressure on water supply induces over-withdrawal from the water system.
Clean and Safe	Changing weather patterns and increased storm intensity threatens water supply safety in the long term. Nonpoint sources pollution regulation is a continual.
Equitable	Access to water (keeping costs down) is critical to life and health. Flooding often happens in low income areas because they are located in low sewer and stormwater infrastructure investment areas. Underserved populations need education to be able to access the emerging job market surrounding green infrastructure and adaptation assessment.

Example City Water Sustainability Indicators

- Sustainable Water Indicators:
  - Drinking Water Quality
  - Gallons of Treated Municipal Water
  - Wastewater Quality
  - Biosolids
  - Sanitary Sewer Overflows
  - Green Roofs
  - Urban Stream Bank Conditions
  - River Water Quality
  - Local Stream Water Floodplain Management

[31] Iowa City, "Sustainability Assessment", 2013